Teacher Development Programme (TDP)

Impact Evaluation of Output 1: In-Service Training

Final Baseline Technical Report, Volume I: Results and Discussion

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June 2016

Acknowledgments

Recommended citation: De, S., Pettersson, G., Morris, R., and Cameron, S. (2016, June). Teacher Development Programme (TDP) Impact Evaluation of Output 1: In-Service Training, Final Baseline Technical Report, Volume I Results and Discussions. EDOREN, Abuja.

Executive summary

Background

The Teacher Development Programme (TDP) is a six-year (2013–19) Department for International Development (DFID) funded education programme seeking to improve the quality of teaching in primary and junior secondary schools (JSSs) and in Colleges of Education (CoEs) in six states in northern Nigeria. TDP is being implemented by Mott MacDonald and is operating its first phase, since 2014 in Jigawa, Zamfara and Katsina, with plans to extend it to Kano, Kaduna and Niger states in late 2016.

This report presents the results from a mixed-methods baseline survey using quantitative and qualitative research methods, to evaluate TDP's in-service teacher training component in the three Phase 1 states. This baseline report is organised into two volumes. Volume I (this report) is intended as a standalone report, which presents an overview of the programme and evaluation, and the baseline results for the programme's treatment and control areas. It is designed to be accessible to all readers. Volume II covers the technical and methodological details underpinning this impact evaluation, including further supplementary analyses not appropriate for Volume I, and is intended for those interested in methods, detailed statistical results and qualitative accounts for each case study school.

The objective of TDP's in-service activities, which is the largest component of the programme, is to provide school-based, cost-effective training to 62,000 teachers by 2019 through:

- **school-based interventions:** collectively termed 'New Classroom Activities,' which comprise teacher training, materials for pupils and teachers, and teacher support;
- **'trainer in the pocket':** which provides access to audio-visual resources through a basic mobile phone (per teacher) and two mobile amplifier-radios (per school) for playing audio-visual materials in the classroom; and
- **continuous support:** provision of ongoing support to teachers through multiple layers and mechanisms (initial orientation workshops, cluster meetings, classroom observation during school support visits by trainers, and audio-visual and printed self-study materials), instead of one-off training. The support mechanism for continuous professional development is expected to be institutionalised within schools (through head teacher leadership and management training and peer support among teachers) and each of the participating states' education systems.

The design of the in-service training component is informed by a theory of change (TOC) that articulates how in-service teacher training activities can result in the desired impact (improvements in pupil learning levels). Pupils can be expected to learn more when they are taught by effective teachers who are skilled and knowledgeable, both in terms of pedagogy and subject knowledge. TDP seeks to create effective teachers by combining the delivery of pedagogical training alongside the promotion of a supportive teaching environment through head teacher support, mentoring and supervision, peer interaction, visiting trainers, and access to learning materials.

- Overview of TDP's role within DFID Nigeria's education portfolio: Section TDP's role within DFID Nigeria's portfolio of education programmes in Volume I
- Overview of TDP and TOC for in-service teacher training: Figure 2, Section Overview of TDP's in-service teacher training output in Volume I; Annex B (Intervention Factsheet) in Volume II.

Baseline survey objectives

The baseline survey covers a range of quantitative and qualitative results at the teacher, head teacher, school and pupil levels. Its objectives are:

- to establish **baseline levels** of teacher effectiveness and pupil learning before the start of TDP's in-service teacher training activities, and especially comparability between the programme's treatment and control groups, which will be used to evaluate programme impact at the follow-up rounds of data collection in 2018;
- to provide baseline results to help inform whether the core **assumptions underlying the TOC** of TDP's in-service output hold in reality, thus offering evidence for **potential adjustments** to TDP's design and implementation as deemed appropriate by the programme and DFID Nigeria; and
- to provide an assessment of the status of pupil learning levels and teacher effectiveness in public primary schools in **some of the most educationally disadvantaged regions in Nigeria** to the government and other stakeholders.

Evaluation design

This baseline report forms part of a mixed-methods theory-based evaluation that will enable exploration of the pathways through which any observed changes are likely to have occurred along various links in the programme's TOC.

The quantitative study design is based on a constrained randomisation of treatment (i.e. participation in TDP in-service teacher training) and control clusters of schools. Randomisation will allow differences in outcomes between the treatment and control groups at follow-up rounds of this evaluation to be attributed to the TDP in-service teacher training. In total, the intended sample size for the quantitative baseline survey across the three states was 336 schools, 1,344 head teachers and teachers, and 2,688 Grade 3 pupils. The survey administered five different instruments covering head teacher and teacher interviews, classroom observations, a Grade 2 assessment (administered to Grade 3 pupils) of English literacy, numeracy and scientific literacy, and a Teacher Development Needs Assessment (TDNA). The same teachers and head teachers, and pupils who were surveyed at the baseline will be surveyed again at the endline in June 2018.

The overall quantitative baseline results for Jigawa, Katsina and Zamfara, combined, show that the randomisation approach was successful, i.e. on average, the treatment and control groups are balanced in their characteristics. Thus the control group may serve as a valid counterfactual for the treatment schools (and teacher and pupils) for measuring programme impact on the key outcomes of interest at the endline (changes in pupil learning levels and teacher effectiveness).

The baseline qualitative fieldwork was carried out in nine schools, sampled from the quantitative survey schools using stratified purposive sampling. In particular, within each of the three states, the 56 treatment schools were stratified into three categories according to the school-level average for teachers' baseline score on the teacher subject knowledge assessment, TDNA: top 10% of schools ('high-performing'), middle 10% ('typical schools'), and bottom 10% of schools ('low-performing'). One school from each stratum in each state was selected (a total of nine schools) for the qualitative sample. Fieldwork consisted of observations, key informant interviews (KIIs) and focus group discussions (FGDs) with head teachers, teachers, pupils, local government and state basic education officials and TDP teacher trainers and programme staff. While the quantitative survey established baseline levels of pupil learning and teacher effectiveness, the qualitative survey

made it possible to assess the strength of assumptions underpinning the programme TOC, to test whether they hold in practice, and to explore pathways through which any observed changes are likely to occur; as well as developing new hypotheses and exploring unexpected impacts at endline.

Generalisability of survey results

The findings of the baseline quantitative survey are representative only of the cluster of treatment and control schools where at least one of the TDP-selected (treatment) or control teachers teaches English, maths or science to Grade 3 pupils. Results are not representative of the three Phase 1 TDP states more broadly. This is because of the purposive selection of TDP clusters by State Universal Basic Education Boards (SUBEBs) in each Local Government Authority (LGA), rather than a random selection from a comprehensive list of potential TDP clusters in each state.

The qualitative findings are not designed to produce results that are generalisable in respect of all schools in the three states. The qualitative research component was based on a relatively small sample of nine schools and sampling for this component was purposive, with the aim of including schools with particular characteristics, as described above. Researchers investigated context in order to construct an argument that a finding in one setting was likely to apply in another. The risk of visiting atypical schools and gaining an incorrect or incomplete understanding of the relevant processes remains, but is somewhat mitigated by visiting schools in different states and contexts, and by paying close attention to ways in which the context of each school may be atypical.

- Overview of mixed-methods approach: Section 2, Volume II
- Overview of impact evaluation design for quantitative survey, sampling strategy, survey instruments, external validity of results, and possible risks to the impact evaluation: Section 3, Volume II
- Overview of impact evaluation design for qualitative survey, sampling strategy, data collection tools, analysis and limitations: Section 4, Volume II

Results: Pupil learning levels and experience of schooling

Analysis of learning outcomes was based on item response theory (IRT) using Rasch modelling, which sorts pupils into three performance levels, each described by a set of competencies expected before Grade 1, at the end of Grade 1 and at the end of Grade 2. The sampled pupils (eight randomly selected in each treatment and control school) were assessed when they had just started Grade 3 based on the Grade 2 English literacy, numeracy and scientific literacy curriculum – hence it is expected that they would demonstrate skills corresponding to those expected at the end of Grade 2.

English literacy

The baseline survey found that English literacy skills are poor among pupils in the TDP treatment and control schools. Only about 3% of pupils in Grade 3 were able to demonstrate the basic English literacy skills expected of them by the end of Grade 2, and 36% displayed emergent literacy associated with the completion of the Grade 1 curriculum. Three out of five students in Grade 3 were at least two full grades behind, indicating that they had not demonstrated progress beyond the level expected of pre-school children.

Numeracy

The vast majority of pupils were considerably behind curriculum expectations in numeracy. The baseline survey found that only 6% of Grade 3 pupils demonstrated basic numeracy skills expected at the end of Grade 2 and 15% demonstrated emergent numeracy associated with completion of Grade 1. Almost four out of five pupils were behind by at least two full grades, with girls and pupils from poorer households significantly more likely to demonstrate lower levels of numeracy as compared to their counterparts.

Scientific literacy

Pupils' performance in the scientific literacy assessment was also poorer than expected for their level of schooling. About 15% of Grade 3 pupils were able to explain everyday phenomena with understanding as expected at the end of Grade 2, and 67% were able to understand these to a level expected at Grade 1. The remaining 18% of pupils had acquired scientific literacy skills only adequate to recognise basic physical properties of everyday items, and were behind by at least two full grades.

Pupils' overall experience of schooling and learning

In all three subjects, girls and pupils from the poorest household wealth quintile performed significantly worse than boys and pupils from the richest household wealth quintile, respectively.

Qualitative accounts from pupils depict a vicious cycle linking household poverty to exclusion from learning in school and broader social exclusion, corroborated by quantitative results that suggest that it is differences in pupils' own family backgrounds and community-level characteristics that explain the majority of variation in pupil learning.

Teachers often alleged that learning levels were low because pupils do not attend school regularly because of (paid or unpaid) work, or because their parents simultaneously enrolled them in Islamic education lessons outside the school.

Although primary schooling is free in Nigeria, schools sometimes charge fees for exams or Parent–Teacher Associations (PTAs) charges or towards the cost of uniforms. There are, therefore, indirect schooling costs even when the direct costs of schooling are presumably minimal or even free – this places poorer pupils at a disadvantage. Pupils' nutritional status is likely to affect their learning in school – many pupils reported coming to school hungry or with very small amounts of pocket money to buy food during the day.

Most pupils' accounts revealed an acceptance of the fact that teachers often did not come to class on time, or at all. Pupils in schools with poor infrastructure were conscious of these problems – if granted magical powers, most pupils said they would add new blocks, repair the classrooms, add concrete floors in schools that did not have them, or add a gate or wall.

- Overview of method of assessment of pupils' learning outcomes: Section 3, Volume II
- Overview of results of assessment of pupils' English literacy: Section Pupil learning levels in English literacy, Volume I

- Overview of results of assessment of pupils' numeracy: Section Pupil learning levels in numeracy, Volume I
- Overview of results of assessment of pupils' scientific literacy: Section Pupil learning levels in scientific literacy, Volume I
- Overview of pupils' overall experience of learning and schooling: Section Pupils' experiences of schooling and learning, Volume I

Results: Teacher subject knowledge

In order to measure teachers' subject knowledge, teachers were asked to write model answers, mark test submissions, demonstrate knowledge through comprehension exercises and prepare pupil worksheets for primary-level English literacy, numeracy and scientific literacy.

English

A very small group (0.4%) of teachers had sufficient subject knowledge to be effective teachers in English. A further 4% were found to have near-sufficient subject knowledge and 42% had emerging subject knowledge. The remaining 53% of teachers had limited professional knowledge of their subject and are unlikely to be effective in the classroom without extensive and continuous training and support.

Mathematics

Only about 8% of teachers had sufficient subject knowledge of maths to be considered effective in the classroom, with an additional 33% and 43% demonstrating near-sufficient and emerging subject knowledge, respectively. The remaining 17% had limited subject knowledge, meaning that they scored less than 25% when tested on their knowledge of topics covered by a Grade 4 pupil.

Science and technology

Only one out of the 1,158 teachers assessed for their subject knowledge demonstrated sufficient subject knowledge in science and technology, with an additional 4% and 33% demonstrating near-sufficient and emerging subject knowledge respectively. Nearly two out of three teachers had limited subject knowledge, meaning they scored less than 25% when preparing worksheets based on the Grade 4 science curriculum.

Perceptions around weak teacher subject knowledge

The qualitative results further demonstrated that teachers, head teachers, and Local Government Education Authority (LGEA) officials showed limited acceptance that lack of subject knowledge was an issue – few respondents showed an understanding of the challenges encountered by teachers regarding their subject knowledge and possible ways to address these.

Assessment and monitoring of pupils' academic progress

The average teacher was unable to correct errors in pupils' work and provide relevant feedback, or identify learning needs of individual pupils and monitor their academic progress over time.

Over 80% of teachers demonstrated only limited ability in this area, compared to the only 0.3% of teachers that demonstrated sufficient knowledge.

- Detailed description of the TDNA instrument, including topics covered under the three subjects and validity of the instrument: Section 3, Volume II
- Overview of results of teachers' subject knowledge of English, maths and science: Section Teachers' subject knowledge, Volume I
- Overview of stakeholders' perceptions of teachers' subject knowledge: Section Perceptions about teachers' weak subject knowledge, Volume I
- Overview of teachers' ability to monitor and assess pupils' progress: Section Do teachers know how to monitor and assess pupils' academic progress?, Volume I

Results: Teachers' pedagogical skills and use of instructional time

The average teacher involved pupils in pupil-centred teaching practices, which characterise effective teachers and classroom practice, for about a quarter of the total lesson time. These effective teaching practices included assisting individuals or groups, explaining how something works or how to do a certain task, asking open questions or giving open responses, moving around amongst pupils, demonstrating or displaying work, and using printed or improvised materials. Simply writing or reading from the blackboard, considered to be a neutral teaching practice, took up 40% of total lesson time.

There was a major loss of instructional time due to shorter lesson length, which necessarily limits the potential for in-class learning to take place. Classroom observations found that 45% of lessons were more than five minutes shorter than a standard 35-minute lesson.

Teachers relied heavily on text books and curriculum guides, especially in the absence of foundational subject knowledge, rather than being able to devise their own lesson plans to reach a specified learning goal. They demonstrated limited ability to adapt the textbook material to the conditions and constraints faced in the classroom. In particular, teachers did not demonstrate ideas about how pupils learn and about how teachers can respond to different learning levels within the same classroom to ensure all pupils achieve at least a minimum level. **In general, teachers' prior pedagogical training does not seem to have adequately equipped them for the realities they faced in the classroom,** including large class sizes, multi-grade teaching, limited resources, and limited ability of parents to support their children.

- Detailed description of the classroom observation instrument: Section 3, Volume II
- Overview of results of teachers' pedagogical skills and instructional time: Sections Results: Teachers' positive interaction with pupils during lessons and Results: Lesson length and loss of instructional time, Volume I
- Overview of teachers' perceptions of their own pedagogical skills: Section Teachers' perceptions of their pedagogical skills, Volume I

Results: Teacher motivation and absenteeism

This baseline report found mixed evidence in regard to teachers being intrinsically motivated to try to improve their teaching, to take part in learning opportunities and to apply new knowledge when they get it. Teachers gave varied descriptions of their attitudes towards the teaching profession, ranging from those who described teaching as an inherently noble profession that advances society, to those who accepted teaching jobs because they were unable to find anything else. One teacher explicitly became a teacher because it allowed him to carry on a side business.

There was strong evidence that teachers felt demotivated due to extrinsic factors. Among these demotivating factors, teachers predominantly talked about low, late and even lack of salary payments, the lack of learning resources and poor infrastructure, lack of promotion or perceived unfairness in promotions, arbitrary transfers, the poor state of infrastructure and teaching resources, over-crowded classrooms, irregular attendance of children, and 'untalented' pupils.

The average daily teacher absenteeism over the previous five days, according to the schools' records, was 14%. The most common reasons cited by teachers for their absence were: own or family illness (58%); collecting salary (20%); and social/religious obligations (10%). However, researchers found that **teachers combined their teaching work with farming or small businesses outside the school.** Some teachers were undergoing further training or education at the same time as teaching, taking them away from their regular jobs. In most schools, researchers also saw teachers arriving late.

Classroom absenteeism, where teachers are present in the school but missing from the classroom, was a common observation in the qualitative survey. One possible reason for this is teachers' specialised training in their Nigeria Certificate in Education (NCE) often does not match the subject that is needed when they are posted to a school, and shortages of teachers in a school can arise in specific subject areas even when there is no overall shortage of teachers in the school.

Results: Contextual factors that affect quality of teaching

Urban or semi-urban case study schools in the qualitative study were generally found to be much better equipped than rural schools in terms of physical infrastructure.

Head teachers frequently noted that their request for additional infrastructure, repairs, and resources from the LGEA/SUBEB went unanswered. Political connections were highlighted as an important determinant of how well equipped schools were.

Textbooks were also not routinely distributed among pupils. This was sometimes because there were insufficient textbooks. **In the rare cases where school resources were sufficient, there was evidence that these were not always managed and allocated efficiently** (for example, unused teaching resources and textbooks stored in a head teacher's office).

The quantitative survey found that about 88% of head teachers reported that their schools were in need of major repairs. Schools in TDP's treatment and control clusters have inadequate physical infrastructure. Schools vary notably in size, with an average of 655 pupils but varying from 142 pupils for the bottom decile to 1,500 or more for the top decile. There are on average 42 pupils per classroom, and 59 pupils per teacher, compared to the official policy of 35 pupils per teacher. Only about 11% of schools had an electricity supply. In teacher interviews, 70% of teachers noted that their school's building was in a 'poor condition', and 33% said they have inadequate materials to do

their job properly. Inadequate classroom resources and poor school infrastructure were ranked among the worst constraints faced by teachers.

- Overview of current levels and drivers of teacher absenteeism from schools and classrooms: Sections Current levels of teacher absenteeism and Drivers of teacher absenteeism, Volume I
- Overview of current levels and drivers of teacher motivation: Sections Current levels of teacher motivation and Drivers of teacher motivation Volume I
- Overview of contextual factors that affect the quality of teaching: Section Contextual factors that influence the quality of teaching and learning, Volume I

Results: School leadership and management

Effective school leadership and management (SLM) is crucial for the success of TDP's in-service training activities. One of the key outputs of the TDP's in-service teacher training activities is enhanced SLM. In addition, it cannot be assumed that teachers will be motivated to adopt new teaching practices without appropriate leadership and management from head teachers. Effective SLM is therefore an important factor in determining whether TDP training leads to improved subject and pedagogical knowledge.

Head teachers are not extrinsically incentivised and in many cases not intrinsically motivated to improve SLM or encourage teachers' adoption of the teaching practices that TDP seeks to promote. There is a risk that head teachers will not exercise their ability to influence such change where they encounter resistance to new practices and where they perceive a risk of disrupting otherwise positive relationships within the school. This would mean that newly acquired subject and pedagogical knowledge is not or superficially applied by teachers in a classroom context.

Head teachers are generally unable to effectively address the widespread problem of teacher classroom absenteeism. This suggests that, even if teachers attend TDP training and improve their subject and pedagogical knowledge, there is a significant risk that teachers will not apply this knowledge in a classroom context because they spend large parts of the school day outside of classes.

Head teachers remain at least partly able to influence teaching techniques and to correct subject knowledge mistakes through lesson observations and feedback. This suggests that head teachers will be able to motivate and persuade teachers that already attend lessons and have improved subject and pedagogical knowledge to adopt the positive teaching practices that TDP seeks to promote.

- Overview of school leadership, management and infrastructure: Section Error! Reference source not found., Volume I

Results: Quality of programme implementation

Quality of implementation and robust delivery of outputs are vital to TDP's success. A 'light touch' process evaluation was undertaken as part of the baseline qualitative study, which took place roughly six months after commencement of implementation of in-service training activities, to study various implementation processes and practical dynamics, and in turn to provide initial impressions of how implementation of the in-service output is progressing.

A number of challenges relating to the programme's delivery model weaken its TOC and reduce its chances of meeting outcome- and impact-level goals. Weak participation in cluster meetings due to factors like language complexities, and barriers such as gender, are persistent. There is also limited evidence of peer-to-peer learning materialising in practice due to low teacher motivation and high absenteeism, leading to limited time devoted to peer interaction. TDP's training materials try to address the constraints faced by classroom teachers (e.g. large class sizes) and propose techniques for effective teaching in the midst of these obstacles. However, observations in the early stages of implementation reveal limited application of these techniques in classrooms, or superficial adoption at best. Confusion among teachers and trainers in regard to the concepts and terminology used by various teacher training programmes is common. While mechanisms exist for routing feedback on the training from teachers to developers of materials and programme managers, it is not clear whether these then prompt action and rectification. Finally, teacher facilitators (TFs) have strong backgrounds in classroom teaching and school administration but encounter some of the same pedagogical limitations in their skills as are faced by teachers themselves, and they face an immense workload in organising and delivering cluster meetings (alongside discharging their day jobs, mostly in the LGEAs).

It is worth emphasising the point that teachers in northern Nigeria have incredibly tough professional duties to discharge – they are expected to teach children where classrooms sometimes do not exist, textbooks are often scarce, and class sizes are large. Teachers' intrinsic motivation to be better educators is often eroded by broad-based poverty and low salaries, and long delays in receiving them. This leads to per diems from cluster meetings becoming a key incentive for participation in training. **A number of these challenges appear to be well beyond the programme's direct ambit of control.** For example, issues of low salaries and late payment relate to federal and state level governance and public financial management issues and it is not straightforward for TDP to influence this, despite these challenges having an immense impact on programme success.

Implications of baseline findings for TDP

One of the primary objectives of this mixed-methods report is to provide baseline results for potential adjustments to TDP's design and implementation, as deemed appropriate by the programme and DFID Nigeria. This section highlights the implications of the baseline findings for the programme.

Pupil learning levels

Pupil learning levels in English, maths and science are very low in the treatment and control areas. Qualitative accounts from pupils suggest a vicious cycle linking household poverty to exclusion from learning in school and broader social exclusion.

This picture of learning levels and pupils' experience of schooling at baseline confirms that the core objective of the programme of improving pupil learning levels is highly relevant in the programme LGAs. Pupils' own family backgrounds and community-level characteristics, which appear to be the key drivers of low pupil learning, may be beyond the scope of a teacher development intervention, yet are likely to impinge on the effectiveness of such interventions – this is indeed a sobering finding for a programme driven by school-based interventions alone and needs to be taken into account when assessing the probability of success. It may be important to ensure that pupils from poorer backgrounds are considered as a target group in the core objective, as well as girls, and to ensure that the teacher training considers how schools can address their particular learning needs in ways that are more socially inclusive.

Teacher effectiveness

This baseline survey investigated whether teachers are motivated to attend school and lessons regularly; whether they have sufficient subject knowledge and pedagogical skills; and whether they have access to sufficient infrastructure and materials. **For a vast proportion of schools studied as part of this baseline survey none of the assumptions hold up fully with strong evidence.**

Some of the issues raised here are likely to remain beyond the scope of a programme such as TDP. For instance, infrastructure problems and large class sizes require action at the federal, state, and local government level, possibly combined with actions to build the capacity of School-Based Management Committees (SBMCs) to hold schools to account.

Action for TDP could, however, focus on how the teacher development materials and activities can take into account the reality of the difficult contexts in which teachers work, and the very limited pedagogical and subject knowledge they currently possess.

It is worth investigating whether there is space politically to push for the government's language policy – of teaching in Hausa in Grades 1–3 and in English thereafter – to actually be enforced, which would mean producing and using Hausa textbooks and assessments for early grade learning. This would still be a radical change as teachers may not be familiar with textbooks written in Hausa, but it would at least mean engaging with the reality of teachers' current understanding of English and would be a recognition of the fact that 99% pupils in this survey reported Hausa as their home language.

SLM

Many of the factors that shape a TDP school's SLM – such as teacher recruitment practices, and the responsiveness of LGEAs/SUBEBs to head teachers' requests – are beyond the scope of TDP.

However, there are potential lessons that can be learned from the baseline research to inform future TDP activities regarding SLM:

- Teacher classroom attendance is a widespread problem but in most cases head teachers alone do not have the means to resolve it. TDP could request that good classroom attendance be an additional criterion for selecting future beneficiaries of TDP training, thereby maximising the chances that new knowledge is applied in a classroom context.

- Head teachers are rarely held to account and therefore are not incentivised to improve performance. This fact makes TDP more reliant on head teachers' own motivation, which is

also lacking in many cases. TDP could consider including activities designed specifically to motivate head teachers.

- Head teachers are sometimes unclear about their rights and responsibilities in relation to other actors in the education system, particularly LGEAs/SUBEBs. TDP's planned head teacher training activities could increase their awareness of these rights and responsibilities and equip them with the skills necessary to navigate such a constraining system.

- A large number of TFs are LGEA staff. Given that many of the constraints on effective SLM are caused by dynamics at the system level TDP may wish to consider how these TFs could foster an honest dialogue between influential community members, SUBEBs, LGEAs and schools to create a common understanding of the drivers of school performance.

Quality of programme implementation

As has been said, duality of implementation and robust delivery of outputs are vital to TDP's success. A number of challenges relating to the programme's delivery model weaken its TOC and reduce its chances of meeting outcome- and impact-level goals, even though a number of these challenges appear to be well beyond the programme's direct ambit of control. It should also be borne in mind that this process assessment was undertaken in the early stages of implementation and it is expected that some of the operational teething issues will be alleviated as the programme matures.

However, there are some challenges which appear to be more within the programme's ability to address in the short or medium term.

- To begin with, teachers and their trainers would find it immensely helpful to **receive materials in adequate quantities and on time,** to avoid them having to pay out-of-pocket to make photocopies, buy stationery, and so on.

- The delivery model will be enhanced considerably if **feedback mechanisms** from teachers regarding the training are routed to those who can address feedback more effectively, and if feedback is followed up on with actions and decisions.

- The programme might further want to consider what value is being added by the idea of training some teachers in a school while leaving out others, given the discussion on limited peer exchanges among selected teachers and possibility of **hostility between TDP and non-TDP teachers** within a school.

- Finally, the **lack of a direct emphasis on subject knowledge in the TDP's training curriculum is a concern**, and something for TDP and DFID to consider and address. Ineffectiveness of training is often driven by limitations imposed by teachers' own absorptive capacity for new materials and pedagogical techniques. In a context where teachers' own subject knowledge is grossly insufficient, more training on newer pedagogical techniques will only build on a weak foundation of subject knowledge, and will limit absorption and adoption of new pedagogical content, thus weakening chances for programme success.

Plans for follow-up quantitative and qualitative research

There are two planned follow-up evaluation activities in the pipeline.

Formative process assessment to inform the programme's future implementation and scale-up: between April and July 2016 a series of implementation-focused studies covering operational and process questions will be undertaken, to informing the programme's future implementation and especially its scale-up (scheduled for late 2016). The TDP evaluation's steering committee has agreed on the following three questions for a process assessment:

- Given the low levels of subject knowledge and pedagogical skills among teachers as established by the baseline survey, how could TDP make the teacher development teams, teacher trainers, cluster meetings and school support visits more effective?

- To what extent do TDP trained teachers understand the content of the print and audio-visual training materials they have been given? To what extent do they use these materials both inside and outside the classroom? How can the programme make the materials more useful and more used – in terms of content, language and usage?

- How could TDP improve school leadership (especially vis-à-vis management and governance) in TDP schools – in terms of ensuring more effective head teachers, education secretaries, inspectors, quality assurance officers, SBMCs and parents?

Endline mixed-methods surveys: These will be conducted in June 2018 as planned, to allow for measurement of any programme impact on teacher effectiveness and on pupil learning levels. The baseline panel of pupils who were at the beginning of Grade 3 in October 2014 will be on the verge of sitting their primary school leaving exams at the end of Grade 6 in June 2018.

- Conclusion and discussion of baseline survey results, implications for the programme, and follow-up quantitative and qualitative research: Section Conclusion and , Volume I

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List of abbreviations

CoE	College of Education
DFID	UK Department for International Development
EDOREN	Education Data, Research and Evaluation in Nigeria
EiA	English in Action
ES	Education Secretary
ESSPIN	Education Sector Support Programme in Nigeria
FGD	Focus group discussion
GEP3	Girls' Education Project, Phase 3
ICT	Information and communication technology
IE	Impact Evaluation
IQTE	Integrated Quranic, Tsangaya education
IRT	Item response theory
JICA	Japan International Cooperation Agency
JSSs	Junior secondary schools
KIIs	Key informant interviews
LGA	Local Government Authority
LGEA	Local Government Education Authority
MDE	Minimum detectable effect
N	Number of observations
NCCE	National Commission for Colleges of Education
NCE	Nigeria Certificate in Education
NEI	Northern Education Initiative
NERDC	Nigeria Educational Research and Development Council
NGN	Nigerian Naira
NGO	Non-government organisation
OECD	Organisation for Economic Co-operation and Development

OPM	Oxford Policy Management
PISA	Programme for International Student Assessment
PTA	Parent–teacher association
PTR	Pupil–teacher ratio
RED	DFID's Research and Evidence Division
SAVI	State Accountability and Voice Initiative
SBMC	School-Based Management Committee
SLM	School leadership and management
SPARC	State Partnership Accountability Responsibility and Capability
SUBEB	State Universal Basic Education Board
TDNA	Teacher Development Needs Assessment
TDP	Teacher Development Programme
TDT	Teacher Development Team
TF	Teacher facilitator
TOC	Theory of change
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development

1   Introduction

This baseline report presents quantitative and qualitative evidence from the impact evaluation of the in-service teacher training component of TDP in three northern Nigerian states: Jigawa, Katsina and Zamfara. It covers a range of results and discussion at the pupil, teacher, head teacher, school and education administration levels.

This baseline report is organised into two volumes. Volume I presents an overview of the evaluation, and the baseline results for the programme's treatment and control areas. It is designed to be a standalone report accessible to all readers. A supplementary Volume II covers the technical and methodological details underpinning this impact evaluation, and further supplementary analyses not appropriate for Volume I, and is intended for those interested in methods, detailed statistical results, and the detailed qualitative background accounts for each case study school.

1.1   Objectives of the baseline analysis

The overall objectives of the baseline analysis are:

- to establish **baseline levels** of teacher effectiveness and pupil learning before the start of TDP's in-service teacher training activities – especially comparability between the programme's treatment and control groups – which will be used to evaluate programme impact at the follow-up rounds of data collection in 2018;
- to provide baseline results to help inform whether the core **assumptions underlying the TOC** of TDP's in-service output hold in reality, thus offering evidence for **potential adjustments** to TDP's design and implementation as deemed appropriate by the programme and DFID Nigeria; and
- to provide an assessment of the status of pupil learning levels and teacher effectiveness in public primary schools in **some of the most educationally disadvantaged regions in Nigeria** to the government and other stakeholders.

1.2   Structure of this volume

This report (Volume I: Results and Discussion) constitutes presentation and discussion of the integrated quantitative and qualitative baseline results for treatment LGAs of TDP's in-service training output. While the quantitative results provide evidence on pupil learning, teacher effectiveness and SLM at baseline, the qualitative research discusses whether the core assumptions underlying the logic of TDP's in-service TOC holds in practice. This report will be supplemented by a series of aggregate and state-level policy briefs on teacher capacity and performance, and pupil learning in the TDP programme LGAs.

This volume of the baseline report is structured as follows. Section Programme background provides an overview, and a discussion of the context of, the TDP programme. It also discusses the objectives of this baseline survey and describes its audience. Section Overview of the impact evaluation design describes the overall evaluation design, the quantitative methods underlying baseline results, the sampling strategy, and the processes of data collection, cleaning and analysis. It also provides a summary of the survey instruments, a brief discussion of the representativeness of results, and possible risks to the impact evaluation. Sections 3–6 present the mixed-methods baseline results for pupils, teachers and schools. Section 7 concludes by outlining potential implications of the baseline results for TDP's design and implementation and the next stages of this impact evaluation.

Gender-neutral language has been used throughout this report to refer to teachers, pupils and parents; where necessary, for ease of reading, the female noun and pronoun have been used to refer to all genders.

2   Programme background

The TDP is a six-year (2013–19) DFID-funded education programme seeking to improve the quality of teaching in primary schools and JSSs, and CoEs in six states in northern Nigeria. TDP is being implemented by Mott MacDonald and in the first phase, which started in 2014, is operating in Jigawa, Zamfara and Katsina, with plans to extend it to Kano, Kaduna and Niger states in late 2016.

2.1   TDP's role within DFID Nigeria's portfolio of education programmes

TDP arises from the recognition that 'children in Nigerian schools are not learning' and that the quality of teaching, which is of central importance to learning achievement, is a 'serious concern' (DFID Nigeria 2012). Despite large investments in education in recent years, the quality of teachers, teaching, and teacher training continues to be of grave concern for Nigeria (Humphreys and Crawfurd 2014).[1] Improving pupils' learning outcomes is at the centre of DFID's approach to aid programming in education, which is based on a learning framework for improving pupil learning outcomes principally through 'strong and accountable education systems' and 'good teachers and great classroom practices' (DFID 2013).

Consequently, through the TDP, DFID Nigeria seeks to improve the quality of teaching in primary schools and JSSs, and in CoEs, in some of the most disadvantaged states of northern Nigeria. As shown in Figure 1, the programme focuses on six northern states: Jigawa, Kaduna, Kano, Katsina, Niger and Zamfara. The TDP is being implemented in Jigawa, Katsina and Zamfara during the programme's first phase (which started in 2014), with the remaining three states to be covered by the programme's second phase (late 2016), with the programme ending in 2019. Volume II discusses the contextual characteristics of the TDP states (especially the levels of poverty, conflict and insecurity, as well as the programme's geographical coverage, in terms of LGAs in the Phase 1 states).

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[1] A full review of the literature on the state of Nigerian public primary school teachers is beyond the scope and purpose of this baseline report, and has been discussed in EDOREN (2014).

Figure 1 States to be covered in TDP's Phases 1 and 2

Note: Maps based on GPS coordinates from www.gadm.org
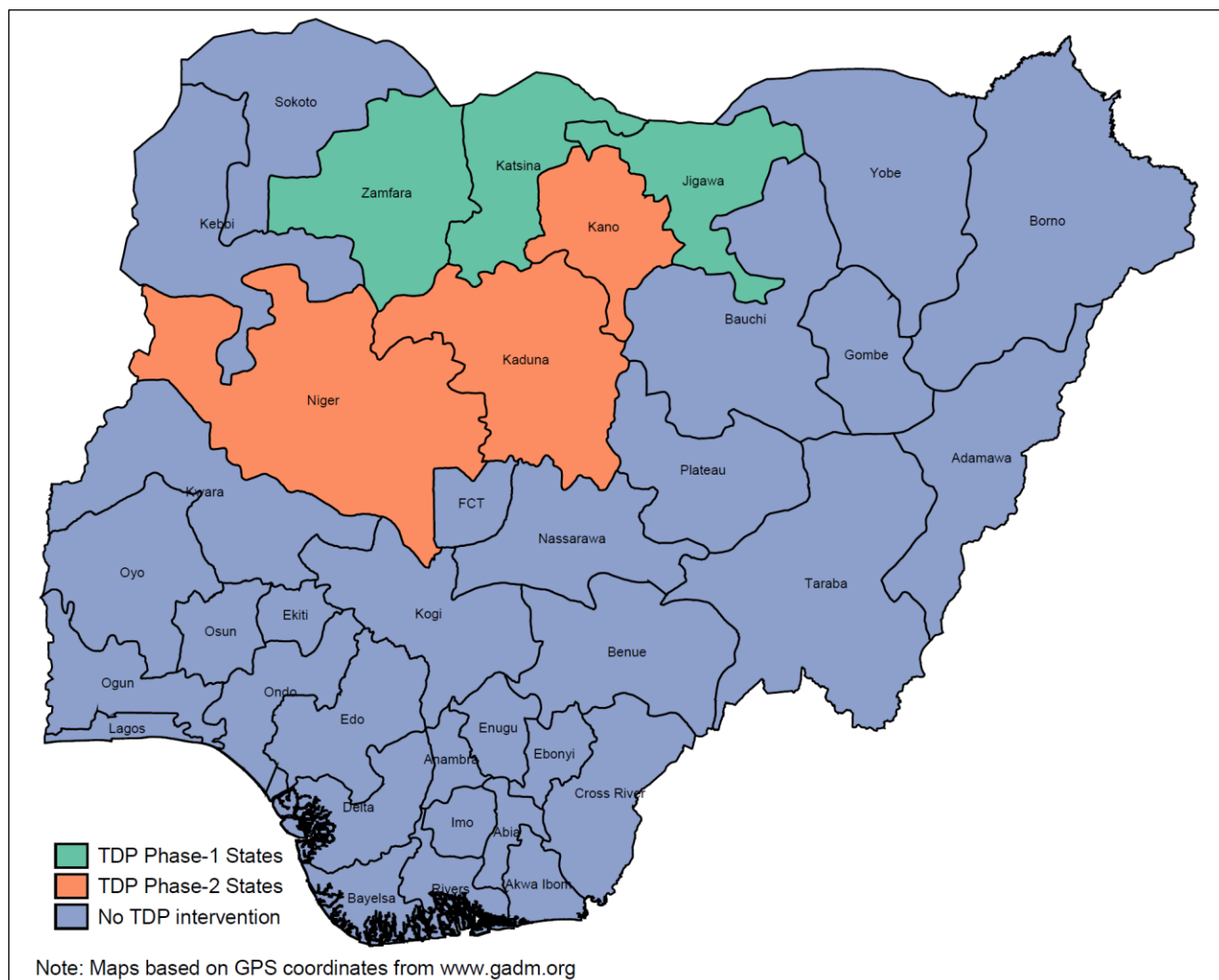
The objective of the TDP is to increase the effectiveness of teachers, in order to ultimately raise pupil learning levels, by:

- improving in-service teacher training in the three core curriculum subjects of English, maths, and science of primary and JSS teachers (Output 1: in-service training);
- developing more effective teacher educators of primary and JSS teachers by reforming pre-service teacher education (Output 2: pre-service teacher education); and
- strengthening evidence-based research to influence and inform policies on teacher effectiveness (Output 3: research and evidence).

TDP's in-service teacher training component is its biggest output, representing approximately 80% of the programme's resources.[2] Given that TDP's 'core business' is teacher training, complementarities are expected with other DFID-funded education programmes in Nigeria. The Education Sector Support Programme in Nigeria (ESSPIN) – which operates in six states, including Jigawa (a TDP Phase 1 state) and Kano and Kaduna (TDP Phase 2 states) – focuses on school quality improvement, accountability and governance. While not part of its primary focus, ESSPIN also conducts training activities in the area of teacher professional development. The Girls' Education Project, Phase 3 (GEP3) – which is implemented by the UN Children's Fund (UNICEF) and operates in five states, including two TDP Phase 1 states (Zamfara and Katsina) and one TDP phase 2 state

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[2] Error! Reference source not found., Volume II, contains a factsheet on TDP's in-service component.

(Niger) – focuses on creating an enabling environment for girls' education in Nigeria.[3] In the area of governance and administration of the teaching workforce TDP will build on systems reform initiatives already underway through other DFID programmes in Nigeria, such as State Partnership Accountability Responsibility and Capability (SPARC-I and II) and the State Accountability and Voice Initiative (SAVI). Their work includes encouraging states to implement existing employment conditions transparently; ensuring that teachers are paid on time; ensuring that recruitment, promotion and deployment is transparent and fair; and ensuring that the system is held more accountable. Finally, in its implementation and evidence generation, it is expected that TDP will also have complementarities and engagement with education programmes being funded by other international development partners, such as the US Agency for International Development (USAID), the British Council and the Japan International Cooperation Agency (JICA) (DFID Nigeria, 2012).[4]

2.2   Overview of TDP's in-service teacher training output

TDP's in-service teacher training output aims to provide a school-based in-service training programme supported by three key activities:

- **'trainer in the pocket'**, which provides access to audio-visual pedagogical resources through a basic mobile phone (per teacher) and two mobile amplifier-radios (per school) for playing audio-visual materials in the classroom;[5]
- **continuous support** through the provision of ongoing support to teachers using multiple layers and mechanisms (initial orientation workshops, cluster meetings,[6] classroom observation during school support visits by trainers, and audio-visual and printed self-study materials), instead of one-off training. The support mechanism for continuous professional development is expected to be institutionalised within schools (through head teacher leadership and management training and peer support among teachers) and each of the participating states' education systems; and
- **school-based interventions** which comprise peer-to-peer learning among teachers, materials for pupils and teachers, and mentorship and teacher support through head teachers.

The in-service teacher training output is intended to provide regular and ongoing training and support to about 62,000 teachers by 2019 (TDP 2014). These in-service activities will be rolled out in participating schools in Phase 1 states by selecting and training, in every participating school, two teachers for English and two teachers for maths on Grade 1–3 materials in Year 1 (2014). In Year 2 (2015) the same four teachers will be trained on Grade 4–6 materials, and subsequently two of these teachers will be trained on Grade 4–6 science materials. The programme will establish

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[3] GEP3 does not have teacher training interventions in Katsina and Zamfara. There is, however, an early learning pilot focusing on early grade literacy and numeracy in Hausa.

[4] USAID's Northern Education Initiative (NEI) operates in two northern states (Sokoto and Bauchi) and provides teacher training for early grade reading in Hausa. JICA provided teacher training in maths and science in three states (Niger, Kaduna and Plateau), with an ambition to cover all Nigerian states; this programme has now ended. The British Council is also working in northern Nigeria in support of English language teacher training.

[5] The audio-visual materials will be produced on secure digital cards, with the aim of achieving wide distribution and usage. Teachers and head teachers participating in training will be provided with a 'technology pack' (a phone, SIM card and charger) that will be held by schools but should be made available for teachers to take home for studying. As mentioned above, each school also gets two amplifiers to play audio-visual materials in the classroom, kept under the care of the head teacher. This is the 'trainer in the pocket' approach that has been used in the DFID-funded English in Action (EiA) programme in Bangladesh.

[6] Frequent cluster meetings between trainers and teachers will be facilitated by grouping programme schools into clusters based on their geographical proximity.

permanent cadres of teacher trainers (called TFs) responsible for the coordination, development and delivery of the in-service training.

The TOC underlying TDP's in-service training component, represented in Figure 2 below, is that pupils learn more when they are taught by effective teachers, and that teachers become more skilled and knowledgeable (both in terms of pedagogy and subject knowledge) through training (DFID Nigeria 2012). Other things being equal, pupils' satisfaction and interest in schooling improves as teacher effectiveness is enhanced, and this increases pupil attendance and learning achievement, and reduces rates of dropout. As a combined result, teachers' motivation rises as they feel more effective when their pupils' learning outcomes improve, and this affects teachers in a number of ways, including by reducing teacher absenteeism. The TDP TOC further assumes that training effectiveness is improved through head teacher support; mentoring and supervision; peer interaction and support from similarly trained teachers who are able to support each other; and regular involvement by visiting teacher trainers, who act not only as trainers but also as mentors and supervisors.

Figure 2 TDP TOC for Output 1: In-service teacher training[7]

TDP **activities and outputs**	TDP **outcomes**	TDP **intermediate impact**	TDP **final impact**

TDP activities following the in-service strategy are expected to lead to outputs in five areas

TDP outputs in five areas:
1. Collaboration and partnership
2. Training and support
3. Materials development
4. Technology use and management
5. INSET programme implementation

Improved head teacher leadership and management

Improved teacher subject content knowledge

Improved teacher pedagogical knowledge

Improved teacher effectiveness in classroom

Improved teacher effectiveness in outside classroom support

Improved learning outcomes in English, maths and science for cohorts taught by selected teachers in TDP schools 2014-2019

Scale outcomes

TDP in-service training improves performance of other teachers in TDP schools

Improved learning for cohorts taught by other teachers in TDP schools states 2014-2019

TDP model applied in other schools in TDP states

Improved learning for cohorts in schools in other states 2014-2019

TDP model applied in other states in Nigeria

Improved learning for cohorts in schools in Nigeria 2016-2019

Sustainability outcomes

TDP model applied sustainably in TDP schools, in other schools in TDP states, and in Nigeria

Improved learning for future cohorts in TDP schools, in other schools in TDP states, and in Nigeria

[7] The links shaded in grey refer to the components of the TOC which are being directly assessed by this impact evaluation.

2.3   Objectives of the impact evaluation

In November 2014 education consultants from Education Data, Research and Evaluation in Nigeria (EDOREN) finalised the evaluation framework for TDP's in-service component, which uses a theory-based, mixed-methods approach to assess if TDP's in-service teacher training model has improved teacher effectiveness and learning levels of pupils in primary education in northern Nigeria (EDOREN 2014).

This impact evaluation has three main purposes:
- **formative:** to help inform the implementation of TDP in its first phase of in-service activities, and the design and implementation in its second phase;
- **summative:** to help inform TDP, DFID Nigeria and other education stakeholders if TDP's in-service teacher training component has led to improvements in teacher effectiveness in English, maths and science and pupil learning levels; and
- **learning** from the TDP about what might work for improving teacher effectiveness in Nigeria and elsewhere.

The primary users of this impact evaluation are DFID Nigeria and the TDP with other key users being: state ministries of education, state commissioners of education, SUBEBs in the six TDP states, the Federal Ministry of Education, the Universal Basic Education Council, the Nigeria Educational Research and Development Council (NERDC), the National Commission for Colleges of Education (NCCE), ESSPIN and GEP3. Additional audiences for the impact evaluation include LGEA staff, head teachers, teachers, pupils and their parents, the DFID Research and Evidence Division (RED), other education donors in Nigeria, and other education projects in Nigeria and internationally.

The two volumes of this baseline report outline TDP, its context and its impact evaluation methodology, and present the quantitative and qualitative baseline results and possible programme implications. Readers might also find the following companion reports and documents of interest:
- TDP quantitative baseline survey state reports for Jigawa, Katsina and Zamfara, which discuss detailed state level results (De, Pettersson, *et al.*, 2015a; De, Pettersson, *et al.*, 2015b; De, Pettersson, and Morris 2015).
- Review of the literature on basic education in Nigeria (Humphreys and Crawfurd 2014), which examines issues pertinent to the constraints faced by primary teachers, pupils and schools in Nigeria.
- TDP in-service training impact evaluation framework (EDOREN 2014), quantitative analysis plan (De and Pettersson 2015a) and qualitative concept note (De, Cameron, *et al.*, 2015) on which the design and analysis of this baseline survey are founded.
- TDP in-service training impact evaluation initial design note (McCormick 2014).
- The Teacher Management Study for Kaduna and Katsina (Watts and Allsop, 2015).
- The Katsina Teacher Supply, Demand and Utilisation Study (2014–2025) (Bennell, Anyawu, and Dodo 2014).

Note: Full references are given in the bibliography.

2.4　Overview of the impact evaluation design

This section gives an overview of the main features of the overall impact evaluation design and then discusses key elements of the baseline surveys. The aim is to give adequate information to set the context for the results that follow, from Section Pupil learning levels onwards. The technical design and details are discussed in relevant chapters in Volume II.

2.4.1　Mixed-methods design

Given the focus on understanding the impact of TDP's in-service teacher training component, and the need to distinguish it from other education programmes, the centrepiece of this impact evaluation is an experimental design based on random assignment of schools to treatment or control status. This approach allows quantitative measurement and attribution of any impact of TDP's in-service training on teacher effectiveness and primary grade pupil learning levels in its Phase 1 states. This forms part of the theory-based mixed-methods evaluation that will also use qualitative research to test whether core assumptions underlying the programme's TOC holds in practice; explore pathways through which any observed changes are likely to have occurred; as well as developing new hypotheses and exploring unexpected impacts.

Figure 3 illustrates how the quantitative and qualitative data sources are combined to provide an understanding of (any) TDP impact and potential mechanisms through which the programme may have influenced the outputs and outcomes of interest. It shows that while the quantitative research focuses on collecting data at the school level, covering head teachers, teachers and pupils in a representative sample of programme impact evaluation areas, the qualitative research collects data in a small purposive sample of local governments and schools.[8]

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[8] As a result of this staggered sequence and timing of the quantitative and qualitative surveys, the evaluation was also able to conduct a 'light touch' process evaluation undertaken as part of the baseline qualitative study, which took place roughly six months after commencement of implementation of in-service training activities. This gave the authors an initial opportunity to study various implementation processes and practical dynamics, and in turn to provide initial impressions of how implementation of the in-service output is progressing. Having said this, it is indeed atypical of baseline surveys, by their very nature, to observe and comment on implementation of an intervention. Thus, the core focus of this baseline survey report is to establish baseline levels of teacher effectiveness and pupil learning before the start of TDP's in-service teacher training activities, especially comparability between the programme's treatment and control groups, which will be used to evaluate programme impact at the follow-up rounds of data collection in 2018.

Figure 3 Quantitative and qualitative data collection at baseline
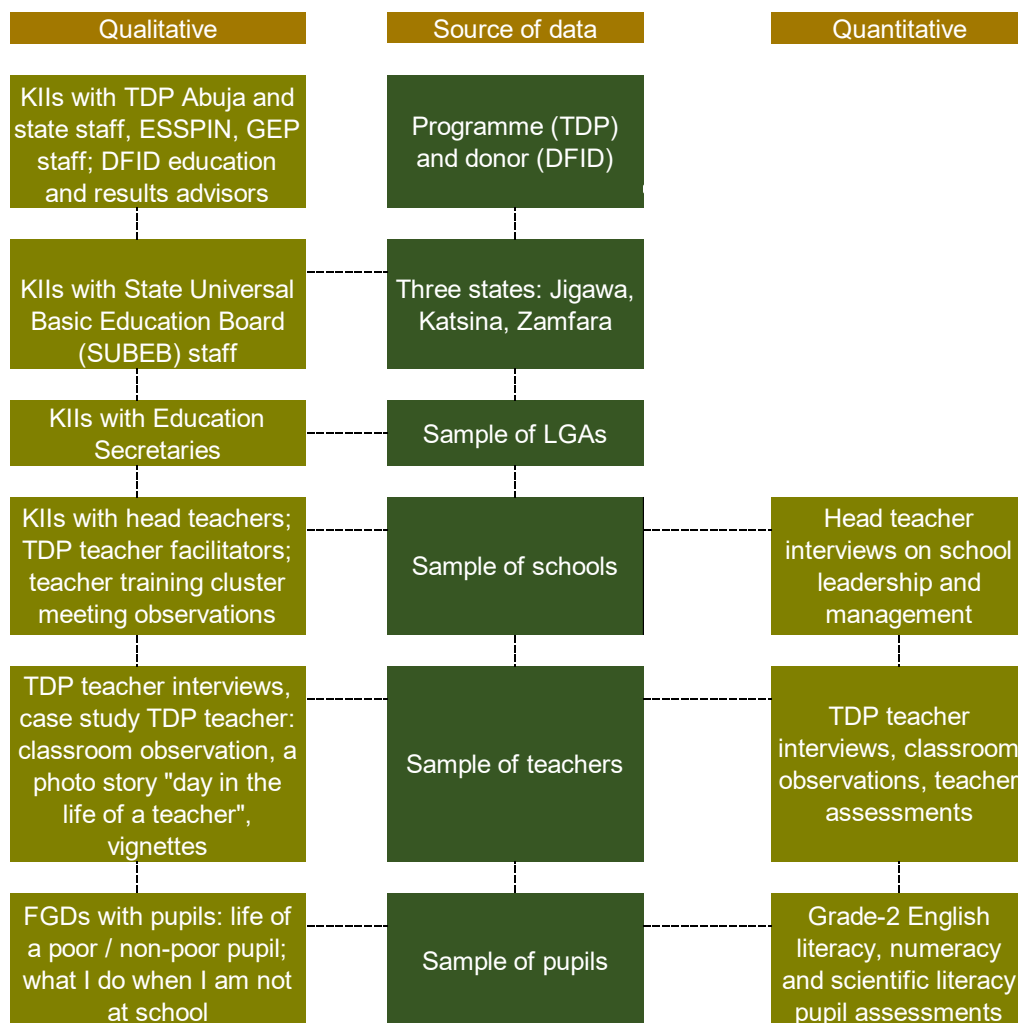
Source: Authors. Note: KII = key informant interview; FGD = focus group discussion

2.4.2   Overview of quantitative and qualitative instruments

During the quantitative survey, the head teacher and selected teachers at each school were interviewed. Each teacher and head teacher who teaches was also observed while they taught a class. Following the completion of the school survey, all teachers and head teachers (irrespective of whether they teach or not) were administered a TDNA at an examination centre. In order to assess pupil learning levels for this baseline survey, eight of all the pupils who started Grade 3 in September 2014, and who were being taught English, maths or science by at least one TDP/control teacher, were randomly selected for the combined English, maths and scientific literacy learning assessment. .

Table 1 lists the quantitative instruments and respondents, and provides brief descriptions of the instruments' contents.

Table 1 Overview of instruments and respondents

Head teacher gender, age, years of experience, academic qualifications, training undertaken Frequency/type of interaction with and supervision of teachers Number of pupils registered and teachers employed, pupil–teacher ratio (PTR), school infrastructure and resources, SBMCs Teacher attendance from school records Portrait photograph of head teacher for panel identification at endline	Head teacher (one per school)
Teacher gender, age, years of experience, academic qualifications, training undertaken Frequency/type of in-service training received Interaction with and supervision by head teacher Self-reported absenteeism Teacher motivation Portrait photograph of teacher for panel identification at endline	Three sampled teachers (teacher motivation questions were also administered to head teachers who teach)
Assessment of subject knowledge and ability to measure and analyse pupil academic progress	Three sampled teachers and head teachers (irrespective of whether they teach or not)
Key teacher behaviour in the classroom, including teacher talk, teacher language, teacher actions Pupil activities in classroom Instances of praise and reprimand by the teacher; use of teaching aids; etc.	Three teachers selected by TDP, and head teachers who teach
English literacy: early literacy, reading with comprehension, writing, other Numeracy: pre-numeracy and Grades 1 and 2 level numeracy questions Scientific literacy: pre-science and Grade 2 level questions Pupil gender, age, language and household assets Portrait photograph of pupil for panel identification at endline	Eight randomly sampled Grade 3 pupils

The qualitative part of the impact evaluation made use of three main research methods –KIIs, FGDs and observations. Table 2 summarises the types of instruments that were used to collect information from different participants in the qualitative research.

Table 2 Instruments administered for each participant group

KIIs	X	X†	X	X†			X	X	X		X
FGDs					X	X					
Observation			X								X

† These were group interviews that included some interactive elements more typical of FGDs.

2.4.3 Sampling strategies and sample sizes

The overall sampling strategy[9] for the quantitative survey was shaped by practical programme considerations and resource constraints. Within these parameters, the design is intended to maximise the statistical power of the impact indicator difference-in-difference measures (and reduce the minimum detectable effect (MDE), to make the evaluation as sensitive as possible to detecting small changes). This is explained further in Volume II. The intended total sample sizes for the quantitative baseline survey for all three states were: 336 head teacher interviews; classroom observations of head teachers who teach (up to 336); 1,008 teacher interviews and classroom observations; 1,344 TDNAs administered to both teachers and to head teachers; and 2,688 Grade 3 pupils tested on Grade 2 learning assessments (Table 3). The same teachers and head teachers, and pupils who were surveyed at the baseline will be surveyed again at the endline in June 2018.

Table 3 Summary of intended sample sizes for the quantitative survey

Evaluation clusters	n.a.	14	14	28	84
Total sampled schools (four sampled per cluster)	n.a.	56	56	112	336
Head teacher interviews	1	56	56	112	336
Head teachers *who teach*: classroom obs.	Up to 1	Up to 56	Up to 56	Up to 112	Up to 336
Teacher interviews	3	168	168	336	1,008
Teacher classroom observations	3	168	168	336	1,008
TDNA (teachers and all head teachers)	4	224	224	448	1,344
Pupil learning assessment	8	448	448	896	2,688

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[9] It is important to note that these reports have used "cluster" in an operational/programmatic sense (borrowing from TDP or ESSPIN) which refers to a collection of schools grouped together by the implementers for logistical purposes. However these "clusters" are not the same as the term "clusters" normally referred to in traditional sampling methodology. Rather than being sampling units drawn from a larger population in order to represent that population, the 84 "clusters" and the schools in them are the whole population that the survey data represents.

For the qualitative component of this impact evaluation the approach to sampling schools is based on stratified purposive sampling. The sample for the qualitative strand is nested within the contexts used for sampling by the quantitative strand. In other words, for each state, the 56 treatment schools selected for inclusion in the quantitative study were first listed in descending order of the average of teachers' baseline scores in the teacher subject knowledge assessment, TDNA. These schools were then divided into three strata, representing the top 10% of schools ('high-performing'), middle 10% ('typical schools', i.e. 45%–55%), and bottom 10% of schools ('low-performing'). Two types of school were removed from each shortlist: schools that were more than 90 minutes' travel from the state capital were removed for logistical and security reasons; and schools that were located in LGEAs that were deemed insecure by security consultants were also removed from each shortlist. Finally, a school was randomly selected from within each strata's shortlist to study in more depth as part of the qualitative study. The process was repeated within each of the three TDP pilot states, Jigawa, Katsina and Zamfara, giving a total of nine schools across the three states. Table 4 below summarises this process.

Table 4 School selection process

56 treatment schools per state	Avg. TDNA score	Top 10% [6]	Accessibility	Top [~2–4]	Random selection	1 High-performing school	x 3 (for each state)
		Mid 10% [6]		Mid [~2–4]		1 Typically-performing school	
		Bott. 10% [6]		Bott. [~2–4]		1 Low-performing school	

Source: EDOREN authors.

2.4.4   Generalisability of baseline results

The findings of the baseline quantitative survey are representative only of the cluster of treatment and control schools where at least one of the TDP-selected (treatment) or control teachers teaches English, maths or science to Grade 3 pupils. Results are not representative of the three Phase 1 TDP states more broadly. This is because the TDP clusters were purposively chosen by SUBEBs in each LGA, rather than being randomly sampled from a comprehensive list of potential TDP clusters (into which all schools can be allocated). Furthermore, in both treatment and control schools, if treatment (or control) teachers did not teach Grade 3 pupils, the entire school was replaced during fieldwork. Replacing schools in this way could introduce a bias, albeit one that is balanced across treatment and control schools, meaning that the impact results would not be representative of TDP impact overall but only of schools where the selected teachers taught Grade 3.

As for the qualitative research, this component was not designed to produce results that are generalisable in the same sense as quantitative data. The qualitative research component was based on a relatively small sample of nine schools and sampling for this component was purposive, with the aim of including schools with particular characteristics, rather than being representative of all schools in the three states. This issue was further compounded by the inability of the research teams to access all or any LGA as they wished, due to security concerns. Thus, more remote schools further away from the state capital were less likely to ultimately feature in the final sample of schools. Generalisability was thus derived from linking qualitative findings to the TOC. In some cases it was

more appropriate to talk of whether findings were transferable rather than generalisable: researchers needed to investigate context in order to construct an argument that a finding in one setting was likely to apply in another. The risk of visiting atypical schools and gaining an incorrect or incomplete understanding of the relevant processes remains, but is mitigated by visiting schools in different states and contexts, and by paying close attention to ways in which the context of each school may be atypical.

2.5   Pointers on how to interpret the results

2.5.1   What the quantitative figures and tables show

All the quantitative figures and tables presented in the results section show the mean estimate or proportion as relevant for each indicator. Unless otherwise stated, the word 'average' has been used in this report to signify central or typical values in the distribution. All figures and tables display the sample size (N) – that is, the number of respondents who answered a particular question for each indicator. In some tables, the estimates have asterisks, which indicate a statistically significant difference between the groups shown: *significant at 10% level **significant at 5% level ***significant at 1% level. The more asterisks that are shown, the more likely it is that the observed difference is due to real differences between the groups rather than to chance, driven by who was interviewed or tested. Some tables and figures compare estimates for different sub-populations, for example male and female pupils.

To give information on the spread of results, the detailed statistical tables in Error! Reference source not found. M of Volume II contain percentile estimates. These are estimated values below which a given percentage of observations lie. For example, the 10th percentile (labelled P10 in the tables) is the estimated value below which 10% of observations lie. Similarly, the 90th percentile (labelled P90) is the estimated value below which 90% of observations lie. These tables also show 95% confidence intervals, which are the range of values for which there is a 95% probability that the estimated confidence interval encompasses the true value of the population parameter. Standard errors are also reported in these tables and these are measures of the accuracy with which a sample represents the underlying population. These statistics have been calculated taking into account single-stage sampling for schools and teachers, and two-stage sampling for pupils within schools.

2.5.2   Weighted estimates

To provide estimates of key indicators that are representative of the treatment and control clusters in the 14 LGAs selected by the programme, the observed values were analysed using survey weights. For instance, if a fixed number of pupils are sampled from Grade 3 of each school irrespective of the number of pupils enrolled in the class, as is the case in this survey, unless weights are used the sample of pupils would be overrepresented by pupils in small schools. The relevant weights to use differs depending on whether analysis is carried out at the school, teacher or pupil level, and survey weights were calculated for each of these levels. For a detailed discussion of the sampling frame and stages see Annex D (Volume II) of this report.

2.5.3   Reference table for assessing strength of evidence

One of the objectives of the baseline analysis is to ascertain whether the core assumptions underlying the TOC of TDP's in-service output hold in reality. At the end of the results section the

authors have summarised the assumptions pertaining to the section, commented on whether the assumptions were met/not met/inconclusive, and the strength of evidence underlying this judgement. Clear standards were agreed between researchers for assessing the strength of evidence that is applied to conclusions about whether assumptions in the TOC held. These are summarised in Table 5 below.

Table 5 Definitions of strength of evidence used by researchers

Strong	Evidence is *both* frequently explicitly mentioned in interviews *and* supported by researchers' own inferences from interviews, context and background literature.
Mixed	Evidence is *either* (a) *both* explicitly mentioned in a minority of interviews *and* supported by researchers' own inferences from interviews, context and background literature; *or* (b) frequently explicitly mentioned in interviews *but not necessarily* supported by researchers' own inferences from interviews, context and background literature. OR There is strong/moderate/weak evidence that an assumption holds in at least two cases but there is strong/moderate/weak evidence that the same assumption does not hold in at least another two cases.
Weak	Evidence is *either* explicitly mentioned in a minority of interviews *or* supported *only* by researchers' own inferences from interviews, context and background literature.

3   Pupil learning levels

This section addresses a set of evaluation questions about how much pupils are learning (; and see also the evaluation matrix in Annex A of Volume II).[10] This information is derived from the English literacy, numeracy and scientific literacy assessments conducted as part of the quantitative baseline survey. It is required both in order to give a picture of current learning levels to inform the programme's design, as well as to make comparisons at endline in order to evaluate the programme's impact. In the final part of the section the qualitative baseline study is used to examine the situations in which children are living, and the aspects of their context that may prevent them from attending school regularly, and learning once they are in school. If these contextual factors act as severe barriers to learning, then the impact of more effective teachers will be limited.

- What are the current levels of learning for Grade 3 pupils in English literacy, numeracy, and scientific literacy? – answered using quantitative survey (pupil learning assessment)
- Is there any significant difference in pupil learning levels between pupils in the treatment and control groups, boys and girls, or poorer and richer pupils? – answered using quantitative survey (pupil learning assessment)
- What aspects of pupils' backgrounds, context and attitudes help explain the current levels of learning? – answered using qualitative survey (FGDs with Grade 3 pupils in separate groups for boys and girls)

As background,   summarises some basic information on the background of Grade 3 pupils gathered during the quantitative survey (for more supplementary statistical tables, see Annex M Volume II).

- The average age of pupils was nine years at the beginning of Grade 3. About 45% of pupils were age-appropriate for Grade 3 (eight to nine years old), while 17% were under-age (less than eight years) and 36% were over-age (older than nine years). Almost 25% of pupils were unable to tell their age.
- Nearly all (99%) of pupils named Hausa as the main language spoken at home. The rest (1%) named Fulfulde, Kanuri or Manga as the main language spoken at home.
- Almost 60% of the sampled pupils were boys.
- In terms of household assets, the average male pupil comes from a less well-off household as compared to the average female pupil.
- Four out of the 2,575 sampled pupils showed one or more forms of disability, including inability to speak or write. They were included in the sample nonetheless, and assessment items which required these abilities were skipped for these pupils.

Source: Quantitative impact evaluation baseline survey (October 2014), pupil learning assessment. Note: Reported percentages are weighted to represent all TDP treatment and control schools.

3.1   Pupil learning levels in English literacy

This section addresses the question: *At the end of Grade 2 have pupils achieved the basic English literacy skills expected at their grade level?* To examine this, pupils were sorted into the three

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[10] This report uses pupil learning *levels* instead of pupil learning *outcomes* to avoid confusion with *outcome* indicators in the logframe.

performance levels shown in Table 6. These are: Level 0, which requires only elementary skills to answer items correctly (pre-literacy); Level 1, which contains Grade 1-level items that require some emerging literacy skills to answer correctly; and Level 2, which comprises Grade 2-level items that require basic literacy skills to answer correctly.[11] A performance level is achieved if pupils are more likely than not to be able to demonstrate the skills linked to that performance level.[12] This baseline survey tested Grade 3 pupils at the beginning of their new school year on items from the Grade 2 curriculum and below. Hence it is expected that they would demonstrate English literacy skills corresponding to Level 2.

Table 6 English literacy assessment framework

Level 0: pre-literacy	Names the letter at the beginning of a familiar word (own name); answers simple oral questions using complete sentences (e.g.: 'What is your name?'); names and writes at least two letters from the alphabet; points to some body parts based on oral cues; orally names some animals and everyday objects based on picture cues.
Level 1: emerging literacy	Reads some two, three or four letter words; identifies some simple written words after hearing them; sounds out or names most lower and upper case letters; identifies first letters of everyday objects and animals; copies short sentences; answers simple questions in full sentence based on visual stimuli; listens to a short story (one paragraph) and answers simple questions.
Level 2: basic literacy	Writes answers to oral questions using some grammar conventions; writes everyday items in plural; spells (written) some two, three or four letter words based on oral cues; reads at least some words from a passage.

3.1.1 Results: Pupil learning levels in English literacy

Data presented in Figure 4 show that only about 3% of pupils in Grade 3 demonstrated basic English literacy skills expected to have been acquired by the end of Grade 2 (performance Level 2). Almost 36% of pupils fell in the middle performance band (Level 1) and demonstrated emergent English literacy skills expected to be acquired by the end of Grade 1. This implies that these Grade 3 pupils had not acquired the basic English literacy skills expected at the end of Grade 2, and thus were falling behind by roughly one full grade. At the bottom of the scale (Level 0) were the largest and most critical group of Grade 3 pupils (61%), who only demonstrated pre-literacy skills and had yet to acquire emergent literacy skills expected at the end of Grade 1. They were below the expected grade level by about two full grades.

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[11] These performance bands are mutually exclusive and collectively exhaustive.

[12] The term 'achieving at band level' means that pupils in a particular band are more likely than not to be able to demonstrate the skills linked to that performance band. In general, the probability of a pupil responding correctly to a question from a lower performance level than the pupil's location in the learning distribution is greater than 0.5, while the probability of responding correctly to a question from a performance level higher than the pupil's location is less than 0.5.

Figure 4 Distribution of pupils by literacy performance levels
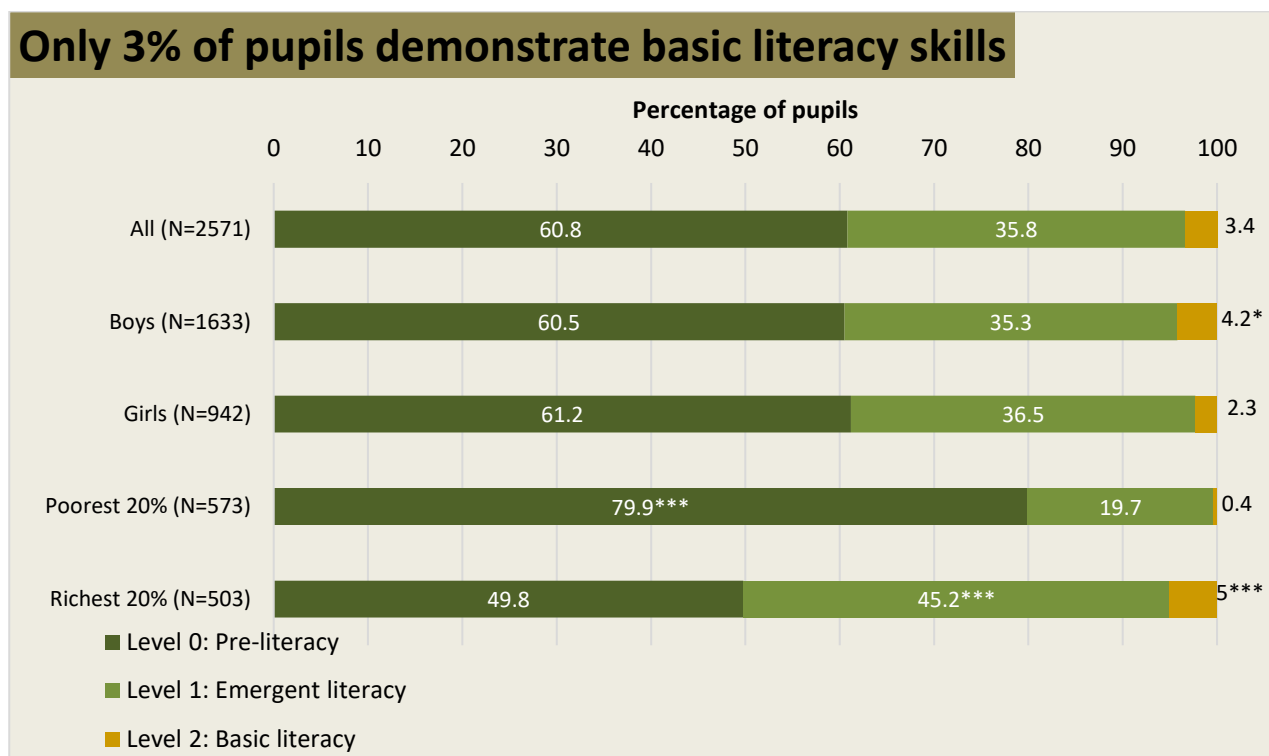
Comparing the distribution of performance in English literacy for different subgroups of pupils revealed a similar pattern for boys and girls at performance Levels 0 and 1. There were, however, significant gender differences in the top performing group (Level 2), with the proportion of boys that have achieved Grade 2-level skills (4%) being significantly larger[13] than the corresponding proportion of girls (2%).[14] The proportion of pupils from poorer households[15] that only demonstrated pre-literacy skills (80%) was significantly larger[16] than the proportion of pupils from richer households (50%). At the other extreme, the proportion of pupils from the poorest households at performance Level 2 (basic literacy) is 0.4%, which is significantly smaller[17] than that from the richest households (5%). There were no statistically significant differences in the proportions of pupils across various performance levels between the treatment and control groups, implying that the pupil learning levels in English literacy were balanced across treatment and control groups.[18][19]

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[13] At a 10% level of significance.

[14] See supplementary tables in Annex M of Volume II for detailed statistical tables.

[15] An asset index was created using principal component analysis. Based on this, the lowest 20% were categorised as the 'poor' quintile and the top 20% as the 'rich' quintile. The asset index was based on photos shown to children of various household assets (a bicycle, a mat, a chair etc.) during the pupil assessment and asking them if they owned the asset or not.

[16] At 1% level of significance.

[17] At 1% level of significance.

[18] Disaggregating pupil performance by main language spoken at home may have provided an interesting insight into the complex relationship between learning levels and language spoken at home, specifically when this is different from the language of instruction in classrooms. However, with almost 99% of pupils being predominantly Hausa speakers this analysis could not be undertaken. This is expected in the north-west zone of Nigeria, which comprises the three TDP states under study, where Hausa is the predominant language. The other languages named by pupils were Fulfulde (0.7%) and Kanuri (0.3%).

[19] See supplementary tables in Annex M of Volume II for detailed statistical tables, including disaggregation by treatment and control groups.

below summarises state-level results on pupil learning in English literacy for Jigawa, Katsina and Zamfara. These are discussed in more detail in the corresponding state report (De, Pettersson, *et al.* 2015a; De, Pettersson, *et al*. 2015b; De, Pettersson, and Morris 2015).

Basic English literacy: scores in Jigawa were significantly lower than in the other two states

All states	60.8	35.8	3.4
Jigawa	76.2	23.7	0.1
Katsina	51.9	43.1	5
Zamfara	61.4	34.9	3.7

■ Level 0: Pre-literacy ■ Level 1: Emergent literacy ■ Level 2: Basic literacy
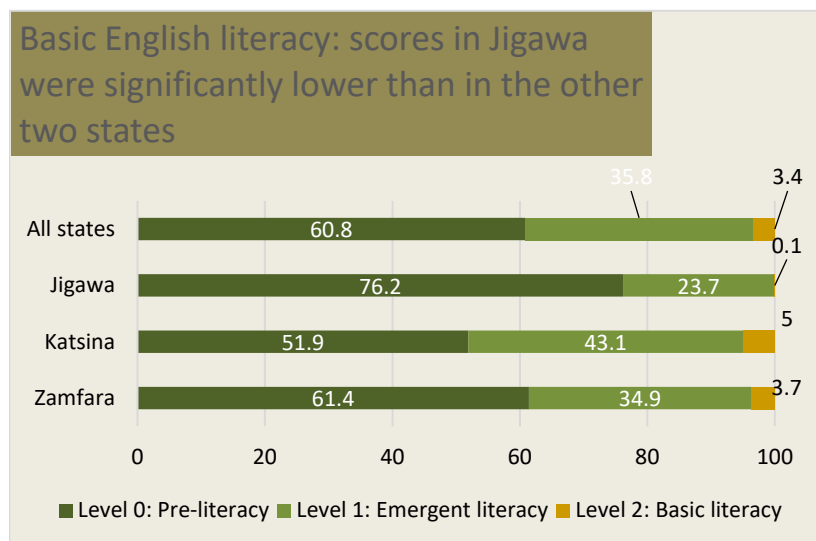
Only a small group of Grade 3 pupils in treatment and control schools demonstrate the basic English literacy skills expected at the end of Grade 2.

Among the three states, pupils in Jigawa perform significantly worse compared to pupils in Katsina and Zamfara. Only 0.1% of Grade 3 pupils in TDP treatment and control schools in Jigawa demonstrate basic literacy skills expected at the end of Grade 2, compared to 5% in Katsina and to 4% in Zamfara.

These impact evaluation survey results are representative of the TDP treatment and control populations. However, these populations are not in themselves representative of the three Phase 1 TDP states more broadly.

For a detailed discussion of the baseline results at state level see the individual state reports (De, Pettersson, and Morris 2015; De, Pettersson, *et al*. 2015a; De, Pettersson, *et al*. 2015b)

3.2   Pupil learning levels in numeracy

This section answers the question: *At the end of Grade 2 have pupils achieved basic numeracy skills expected at their Grade level?* To examine this, pupils were again sorted into three performance levels, as shown in Table 7. These levels include pre-numeracy items that require only elementary skills to answer correctly (Level 0); Level 1, which largely contains Grade 1-level items that require some emergent numeracy skills to answer correctly; and Level 2 mainly constituted of Grade 2-level items that require basic numeracy skills to answer correctly.[20] As mentioned above, sampled pupils who had just started at Grade 3 were expected to demonstrate Level 2 numeracy skills.

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[20] These performance bands are mutually exclusive and collectively exhaustive.

Table 7 Numeracy assessment framework

Level 0: pre-numeracy	Recognises most one-/two-digit numbers; counts orally from one to 10; performs simple quantity discrimination tasks; measures lengths using non-standard methods (palm, steps)
Level 1: emergent numeracy	Measures lengths using conventional methods (rulers); counts from 100 to 110; completes simple missing sequences of single-digit numbers; recognises basic 2-D shapes; performs money sums for small amounts (up to Nigerian Naira (NGN) 10); and addition/subtraction sums of one/two digits
Level 2: basic numeracy	Performs two-/three-digit addition/subtraction sums, money sums for amounts or change up to NGN 500, one-digit multiplication sums

3.2.1   Results: Distribution of pupil learning levels in numeracy

The distribution of pupils by numeracy performance level is shown in Figure 5 below. The top bar shows that only a small percentage of Grade 3 pupils (6%) in TDP treatment and control schools demonstrated basic numeracy skills expected at the end of Grade 2. A larger group of pupils, around 15%, demonstrated emergent numeracy skills expected at the end of Grade 1, and this group was roughly one grade below the level expected. The largest group of pupils by far (79%), had not yet achieved emergent numeracy skills, and were thus below the expected grade level by roughly two grades.

Figure 5 Distribution of pupils by numeracy performance levels

Less than 6% of Grade 3 pupils demonstrate basic numeracy skills
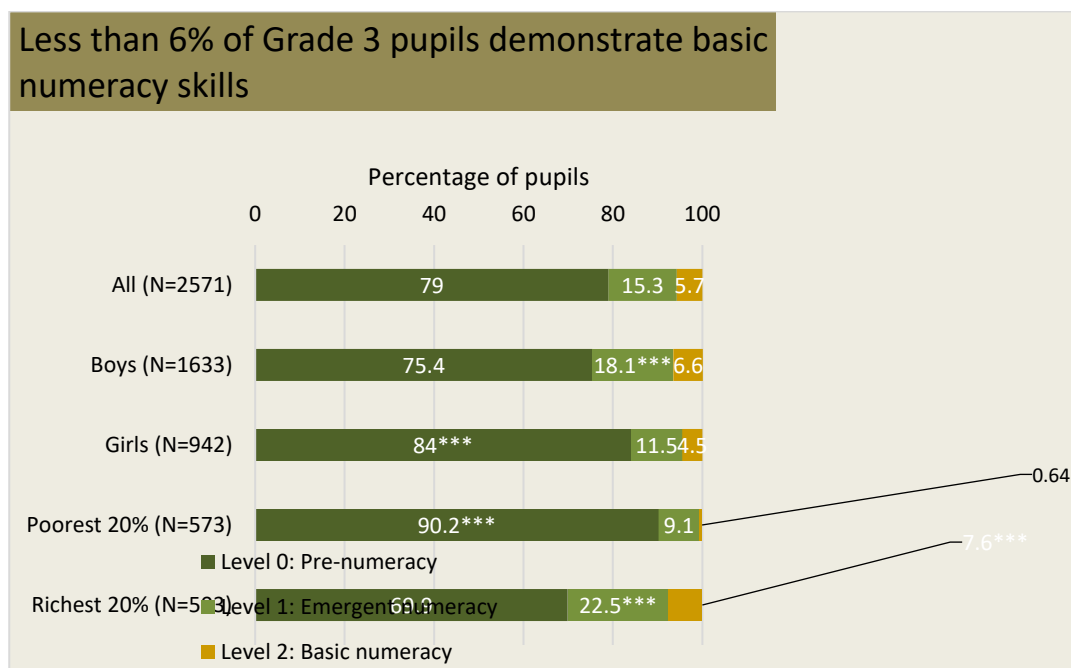
Comparing the distribution of different subgroups of pupils revealed that boys performed better than girls overall. The proportion of girls (84%) with pre-numeracy skills was significantly larger than the proportion of boys (75%) at Level 0, while the proportions of boys at Level 1 (emergent numeracy) was significantly larger than the proportions of girls at these levels.[21] No significant differences were found in the proportion of boys vis-à-vis girls performing at Level 2 (basic numeracy).

Differences in learning levels across subgroups were particularly stark between pupils from poorer versus richer households. The proportion of pupils from the 20% of poorest households that demonstrated pre-numeracy skills (Level 0) was 90%, significantly larger[22] than the proportion of pupils from the richest 20% of households (70%). Conversely, while almost 8% of pupils from the richest 20% of households demonstrated basic numeracy skills, less than 1% of pupils from the poorest households did so. There were no significant differences in the proportions of pupils at various performance levels of numeracy across the treatment and control schools, suggesting that pupil learning levels in numeracy were balanced across the treatment and control groups.

below summarises state-level results on pupil learning in numeracy for Jigawa, Katsina and Zamfara. These are discussed in more detail in the corresponding state report (De, Pettersson, *et al*. 2015a; De, Pettersson, *et al*. 2015b; De, Pettersson, and Morris 2015).

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[21] Both at 1% level of significance. See supplementary tables in Annex M of Volume II for significance tests.
[22] At 1% level of significance.
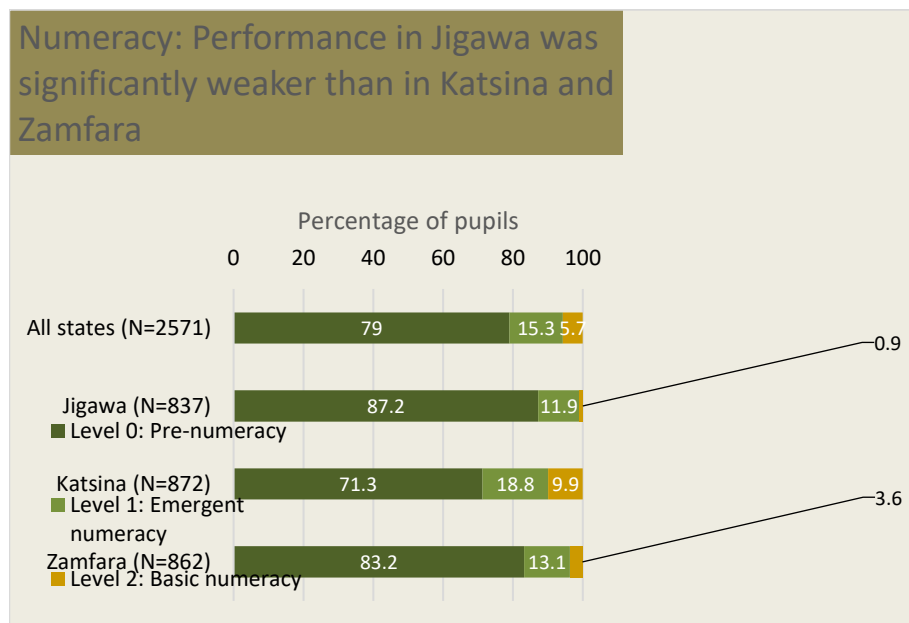
Numeracy: Performance in Jigawa was significantly weaker than in Katsina and Zamfara

Percentage of pupils

All states (N=2571)	79	15.3	5.7	0.9
Jigawa (N=837)	87.2	11.9	
Katsina (N=872)	71.3	18.8	9.9
Zamfara (N=862)	83.2	13.1	3.6

Level 0: Pre-numeracy
Level 1: Emergent numeracy
Level 2: Basic numeracy

Only a small group of Grade 3 pupils in treatment and control schools demonstrate the basic numeracy skills expected at the end of Grade 2.

Among the three states, pupils in Jigawa perform significantly worse compared to pupils in Katsina and Zamfara. Fewer than 1% of Grade 3 pupils in TDP treatment and control schools in Jigawa (five pupils) demonstrate basic numeracy skills expected at the end of Grade 2 (Level 2), compared to 4% in Zamfara and 10% in Katsina.

These impact evaluation survey results are representative of the TDP treatment and control populations. However, these populations are not in themselves representative of the three Phase 1 TDP states more broadly.

For a detailed discussion of the baseline results at state level see the individual state reports (De, Pettersson, and Morris 2015; De, Pettersson, *et al*. 2015a; De, Pettersson, *et al*. 2015b).

3.3   Pupil learning levels in scientific literacy

Alongside assessments in English literacy and numeracy, the sampled Grade 3 pupils were administered an assessment of scientific literacy skills.[23] As shown in Table 8, the scientific literacy assessment framework used for this analysis links performance levels to competencies, with the expectation that at the end of Grade 2 a pupil would demonstrate abilities corresponding to Level 2.

Table 8 Scientific literacy assessment framework

Level 0: observes	Orally describes or recognises basic properties like size, taste, weight, length and colour of everyday objects

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[23] According to OECD-PISA, 1999, scientific literacy is often defined broadly, and is the '…the capacity to use scientific knowledge, to identify questions and to draw evidence-based conclusions in order to understand and help make decisions about the natural world and the changes made to it through human activity.' Our scientific literacy test covered the topics of size, weight, colour and taste discrimination; the motion of objects in water and air; work and effort; and everyday chemical processes relevant to the northern Nigerian context (dyeing cloth). The items all related to a specific strand of scientific literacy, namely the use of science understandings to describe and explain natural phenomena, and to interpret reports about phenomena.

Level 1: understands	Understands interactions, everyday physical and chemical processes or effects that have been experienced using an abstract scientific concept
Level 2: explains with understanding	Understands and orally explains processes or effects in terms of a non-observable property (i.e. phenomena that pupils may not have experienced or seen first-hand) or an abstract science concept

3.3.1   Results: Pupil learning levels in scientific literacy

Data presented in Figure 6 show that 15% of pupils in Grade 3 demonstrated the ability to understand and orally explain everyday processes and phenomena using abstract scientific concepts. This group had roughly achieved the level of scientific literacy expected at their grade level. Around 67% of pupils fell in the middle performance band (Level 1) and demonstrated the ability to understand interactions and everyday physical/chemical processes, but not explain them. This meant that these Grade 3 pupils had not yet acquired the scientific literacy skills expected at the end of Grade 2. At the bottom of the scale (Level 0) was a group of Grade 3 pupils (18%) who demonstrated the ability to orally describe and recognise basic physical properties of everyday objects, but were not able to use abstract scientific concepts to understand the natural world around them or explain these phenomena.

Figure 6 Distribution of pupils by scientific literacy performance levels
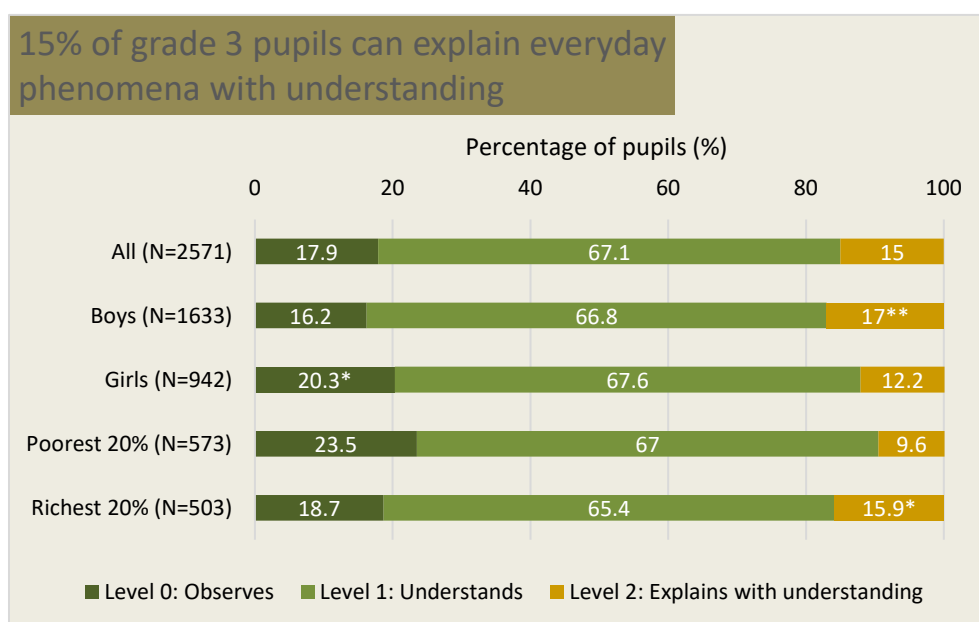
Results revealed similar proportions of boys and girls in the middle performance band for scientific literacy (Figure 6) but there were significant gender differences (at 5% and 10% levels, respectively) in the size of the highest performing group (17% boys and 12% girls), and of the lowest performing group (16% boys and 20% girls).[24] The proportion of pupils from the richest 20% of households in the highest performing group (16%) was significantly larger than the proportion of pupils from the poorest 20% of households (10%).[25] There were no significant differences in the proportions of pupils at various performance levels of scientific literacy across the treatment and control schools, suggesting that pupil learning levels in scientific literacy were balanced across the treatment and control groups.

While the scientific literacy results are seemingly better than the English literacy and numeracy results caution is recommended in drawing comparisons across the three subjects because the three parts of the test assessed different competencies and skills. For instance, one reason for the relatively better performance on scientific literacy could be the presence of a number of test items that assessed pupils on size, weight and length discrimination (e.g. 'which pencil is longer?' with pictorial aids) which are probably competencies pupils pick up from their environment, perhaps even before they enrol in school. To answer these items correctly also does not require simultaneous application of another function, like reading or writing. In comparison, some of the Level 0 English literacy and numeracy items required skills like writing an English letter, or identifying single-digit numbers, which are arguably skills that are not picked up naturally from the environment and which do require simultaneous functions of writing or reading. Hence, it is possible that sampled pupils effectively found the scientific literacy test easier than the English literacy and numeracy tests.

below summarises state-level results on pupil learning in scientific literacy for Jigawa, Katsina and Zamfara. These are discussed in more detail in the corresponding state reports (De, Pettersson, *et al*. 2015a; De, Pettersson, *et al.* 2015b; De, Pettersson, and Morris 2015).

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[24] See supplementary tables in Annex M in Volume II for significance tests.
[25] At 10% level of significance.

Scientific literacy: Performance in Jigawa was significantly weaker than in Zamfara and Katsina
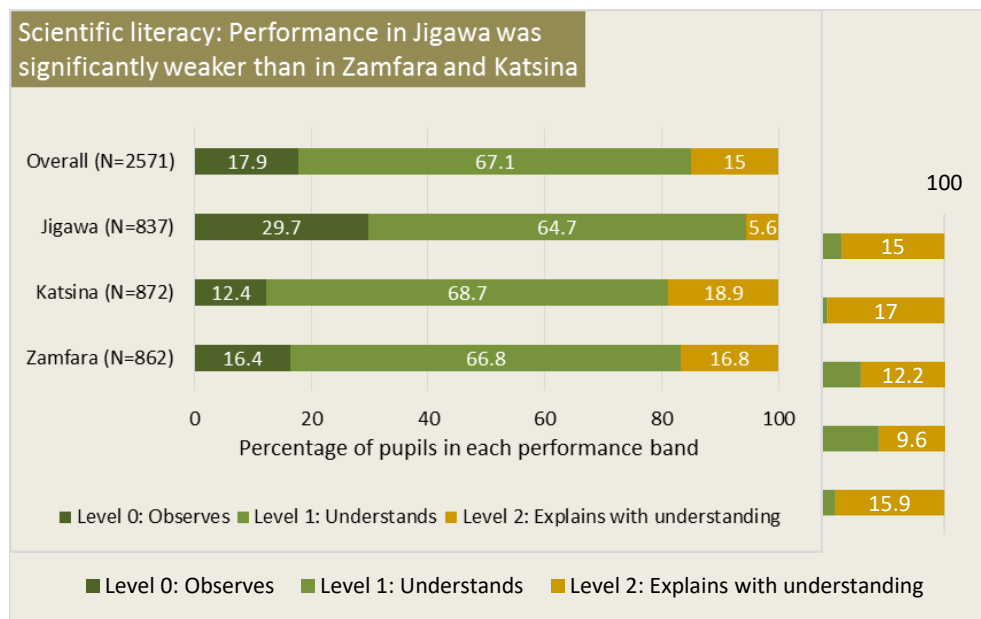
Only 15% of Grade 3 pupils in treatment and control schools demonstrated the scientific literacy skills expected at the end of Grade 2.

Among the three states, pupils in Jigawa performed significantly worse compared to pupils in Katsina and Zamfara. Fewer than 6% of Grade 3 pupils in TDP treatment and control schools in Jigawa demonstrated scientific literacy expected at the end of Grade 2 (Level 2) compared to 17% in Zamfara and 19% in Katsina.

These impact evaluation survey results are representative of the TDP treatment and control populations. However, these populations are not in themselves representative of the three Phase 1 TDP states more broadly.

For a detailed discussion of the baseline results at state level see the individual state reports (De, Pettersson, and Morris 2015; De, Pettersson, et al. 2015a; De, Pettersson, et al. 2015b).

3.4   Pupils' experiences of schooling and learning

The following sections of this report will argue that much of the explanation for low levels of learning lies with the ways pupils are taught, their access to learning materials, teaching quality and instructional time, and ultimately with overall school management. Part of the explanation for low levels of learning, however, is likely to lie in pupils' backgrounds and the levels of support their families are able to provide. This includes issues relating to whether pupils attend school regularly, and reasons, such as child work, that might prevent them from attending; whether they have sufficient nutrition, rest, and time for learning outside school; and whether parents are able to support their learning directly, through help with homework or reinforcing positive behaviour ( ). These aspects of pupils' lives may be beyond the scope of a teacher development intervention, and yet are likely to impinge on the effectiveness of such interventions. They need to be taken into account in programme design and in assessing the probability of success.

This section draws mainly on the results from qualitative discussions with groups of pupils in nine schools across the three states to present pupils' perspectives on schooling and learning, including how pupils see their schools and teachers, and their attitudes towards problems that might constrain their learning. In each school, a group of girls and a group of boys participated, with around eight pupils in each group.

Attendance and child work
- Do pupils attend their school lessons regularly? What are the reasons if they don't attend?
- How might other out-of-school obligations limit their attendance or the time that they can spend on learning outside school?

Pupils' household background
- Do pupils have sufficient nutrition and rest time to be able to concentrate during lessons?
- Do pupils have opportunities outside of school hours to reinforce their learning through discussion and homework? What support do parents provide to their children?
- Do parents encourage children by reinforcing positive behaviour and learning outcomes?

Pupils' attitudes to school and teachers
- What are pupils' attitudes towards their schools and teachers?
- What problems do pupils perceive in the school that might constrain learning?

3.4.1   Attendance and child work

When asked to rank the problems they face, teachers placed pupil absenteeism among the most important. Observed attendance was typically much lower than the numbers of pupils officially registered in each class. The qualitative interviews were carried out with pupils in school at the time of the survey team's visit, and so provide only a partial picture of the pressures that might be placed on pupils' attendance. Teachers and head teachers often alleged that pupils do not attend school regularly because of (paid or unpaid) work, or because their parents prefer them to be simultaneously enrolled in lessons outside the school focused on Islamic education.

Most pupils acknowledged that they carried out household chores. Their household responsibilities included helping on the farm, washing dishes, fetching water, cleaning, sweeping, buying and pounding ingredients, running errands, and helping with cooking. Some of these activities may be carried out more by one gender than another, but in qualitative interviews there was no clear division. A small number of both boys and girls also said that they hawked goods, and one boy claimed to help with car repairs in a garage. However, most of the pupils said that these household responsibilities were undertaken outside of their school hours and did not affect their schooling. Some admitted that tasks such as fetching water, in relation to farming, would sometimes make them late for, or even miss, school. In a few schools, based on discussions and after looking at pupils' notebooks, it was clear that most of the pupils in the focus group had missed the previous day's school.

Many pupils attended part-time Islamic education lessons in the morning or evening under a local *mallam* (teacher), although pupils claimed that this did not affect their attendance at the government school. Teachers and head teachers raised cases of pupils who had left the government school altogether to attend a *tsangaya*,[26] although in one school two boys staying at a residential *tsangaya* school had been allowed to attend the government school during the day.

3.4.2   Household resources for schooling

Although primary schooling is free in Nigeria, schools sometimes charge fees for exams or PTA charges. Additionally, pupils are expected to wear uniforms. There are, therefore, indirect or unofficial schooling costs, even when the official costs are zero.

Pupils' nutritional status is likely to affect their learning in school. As described below, some pupils are described as coming to school hungry and without money for food, due to their parents' limited ability to support them. Furthermore, in theory pupils need time and support from parents to complete homework, but pupils' and teachers' accounts suggested that pupils rarely do homework outside of the school, instead they use the time when teachers are not present in the classroom to complete assignments.

Finally, parents' encouragement and monitoring of their pupils is likely to be important in ensuring they attend regularly; in several schools, teachers ranked lack of support from parents as being among the main constraints that they faced, and this was often cited as a reason for poor attendance in class.

3.4.3   Pupils' experiences of schooling

As part of the qualitative discussion, pupils were asked to imagine and describe a happy and an unhappy child. For the happy child, pupils tended to describe a pupil who has adequate study materials (e.g. stationary, school shoes, etc.), a clean uniform, free time to play, a packed lunch or pocket money for food, and friends in school, and who is loved by teachers and elders, as illustrated by the quotes below from a boys' FGD:

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[26] *Tsangaya* is a traditional form of qur'anic religious education where the teacher moves with his pupils in the belief that an itinerant life is essential for them to fully concentrate on their study. The itinerant children attending *tsangaya* education are called *almajirais*.

> *Interviewer: Now let us think of a boy who is happy with his school, and even happy at home. Let us close our eyes for a while and think about our friend who is happy with his school, and even happy at home. Tell me about our friend…*
>
> *Pupils: He is smiling and happy…he has a cap, his uniform is very clean, he comes to school with writing materials school bag, pens, and pencils….He has a bicycle; he comes with 20 naira pocket money, and his parents loves him as well as the teachers, he is the head teacher's pet.*
>
> *Interviewer: What kind of food does he come to school with?*
> *Pupils: Indomie noodles, rice and stew, bread sometimes yam, sometimes sweet and water in his bag.*
>
> *Interviewer: Let's talk about his family, his lifestyle at home, his hobbies.*
> *Pupils: He runs errands for his mother; he pays attention in the class.*

For the unhappy child, pupils tended to build up a picture of a child who is a social and academic outcast: poor, dirty, unintelligent, disobedient, aggressive, a cheat, a thief, and irreligious. The unhappy pupils' hunger and difficult household background makes him or her, in pupils' accounts, behave aggressively and rudely towards teachers, who then punish the pupil or make him or her repeat grades, and this in turn worsens the pupil's attitude towards the school. Rather than sympathising with this imaginary pupil, the discussants said they would avoid the unhappy pupil and not befriend him or her because s/he is perceived as troublesome and has an unkempt appearance. The following quotes illustrate this.

> *Interviewer: Let us talk about his life in the class please? Does he come to school every day?*
> *Pupils: He is dull in the class, comes to school without a good uniform and no pocket money, his bag contains only some pieces of papers, and even if he asks his parents don't provide for him, many times he absents himself from the school.*
> *Interviewer: Why?*
> *Pupils: Because he hates school, he will prefer to go to farm and work and get paid, his head is very dirty. [Boys' FGD]*
>
> *Interviewer: Why does he come late to school?*
> *Pupils: Because they flog him.*
> *Interviewer: Because they flog him?*
> *Pupils: Yes, they flog him in school and when he goes home they also flog him so he comes to school angry. [Boys' FGD]*
>
> *Pupils: She cries a lot, sometimes teachers send her back home if she keeps crying in the school, her house is far away from the school, and it is a mud house.*
> *Interviewer: Why do you think she is not happy, or why do you think she cries a lot in the school?*
> *Pupils: She doesn't want to come to school; she has no good uniform, no shoes.*
> *[…]*
> *Interviewer: How do teachers treat her in the class?*
> *Pupils: They sometimes used to beat her because even if they talk to her she would never stop crying, she is dull, she doesn't copy notes or answer questions in the class.*
> *Interviewer: Why do you think she cries a lot?*

> *Pupils: She hates school maybe that is why she cries a lot, she abstains from school, she has a worn-out uniform. [Girls' FGD]*

The accounts of both pupils and teachers indicated that pupils have some agency in deciding whether or not to attend school. This would suggest that pupils' experience of school is an important influence on attendance. The pupils who lack parental support are depicted as having distressing experiences in school and, in some cases, as dropping out or attending school inconsistently.

The association between child work and this pattern in pupils' accounts was not straightforward. In several cases farm work was associated with the unhappy child, while the happy child was sometimes depicted as willingly helping with household chores. This suggests a distinction between accepted forms of children's work, compatible with a good experience in school, and other forms of work where pupils' and teachers' views were more ambiguous.

Coming to school hungry and with no pocket money is closely linked to the pupil being unhappy and is depicted as driving a series of bad behaviours. As noted in the preceding sections, pupils from poorer households were significantly less likely than pupils from richer households to achieve test scores at the expected grade level in English literacy, numeracy, and science. Pupils' accounts are suggestive of the causal links that might underlie this pattern. They depict a vicious cycle linking household poverty – manifested particularly by coming to school hungry, without money to buy food, and without a proper uniform – to exclusion from learning and broader social exclusion.

3.4.4 Pupils' attitudes towards their school and teachers

Pupils did not articulate in detail what they liked or disliked about teachers, except to identify some teachers who were particularly violent in the way they punished pupils, and others who made lessons more fun by using activities like singing or jokes. As mentioned above, the happy child described by pupils is one who is loved by his or her teachers, while an unhappy child is one who is often hurt physically or humiliated by the teachers for not being able to answer questions. The quotes below illustrate this.

> *Pupils: Malam A---, he beat us a lot, he used cable and other sophisticated instruments to beat us with it, we thank God they transferred him to secondary school now. [Boys' FGD]*

> *Interviewer: Let's talk about his [the unhappy child's] relationship with teachers, how do his teachers treat him?*
> *Pupils: If they ask a question and he couldn't answer, teachers use to beat him and give him all sort of punishment like frog jump and the rest, and sometimes the teachers threatened to lock him up in the office for two days. [Boys' FGD]*

Most pupils' accounts revealed an acceptance of the fact that teachers often did not come to class on time, or at all. While it was rare for pupils to criticise their teachers directly, they were frank about classes not being held regularly, and occasionally, as in the quotation below, recognised how badly this was affecting their learning. As explained in Section Teacher effectiveness below, one in seven teachers were typically found to be absent during the quantitative study. In the FGDs, pupils told researchers that when teachers were absent they would copy notes from the previous day or complete homework, or just wait. In observations of some classes where no teacher was present, pupils played noisily.

Interviewer: Do you want your teachers to be changed?
Pupils: We want the old teachers to be changed because they sleep and they don't enter class every day.
Interviewer: Old as in how? Age wise, or they stayed longer in the school?
Pupils: They stayed long in the school, so we want new teachers though our Hausa teacher is new but she has never entered our class. [Boys' FGD]

Pupils in schools with poor infrastructure were conscious of the problems this caused for the teachers, and were not themselves in a position to do anything about this. When asked what they would do if they could magically transform their schools, most pupils said they would add new blocks, repair the classrooms, add concrete floors in schools that did not have them, or add a gate or wall. One group of children in a rural school wished that their school would become 'like an urban school', showing that they were aware that not all schools suffered similar problems to theirs. More often, though, pupils recognised the effects of the infrastructural issues on their learning but could do little other than to accept the situation:

Interviewer: You find maths easy to understand?
Pupils: No not very well.
Interviewer: Why don't you understand it very well?
Pupils: The board has a hole so we cannot see very well.
Interviewer: Is it only the maths teacher that writes on the board with a hole or all the teachers?
Pupils: Some divide the board into two and write on the part without a hole.
Interviewer: Don't you tell them you cannot see?
Pupils: They said we shouldn't make noise in class [Girls' FGD]

As will be explained in the following sections, pupils typically spent a lot of time copying notes from the board. While some were able to understand and read out the notes that they had written, most were not able to identify basic information such as the date or title. Some pupils were not sure which exercise book related to which subject. This suggests not only that learning outcomes are poor, but that pupils spend much of their time on futile exercises that do nothing to address their learning needs.

4   Teacher effectiveness

In order to understand how to improve teaching in northern Nigeria it is important to understand how effective teachers currently are, the factors that might enable them to become more effective, or prevent them from doing so, and the context in which they are working generally. This analysis is guided by examining assumptions regarding four key aspects of teacher effectiveness that our analysis suggests underpins the in-service intervention being studied. Prior evidence suggests that these assumptions need to hold for the programme to work as expected. If they do not hold, the programme will need to take this into consideration, and perhaps in some cases, revise its TOC or design. These assumptions are:

- **Subject knowledge**: Teachers have the foundational subject knowledge to be able to understand training and curriculum materials (Section Teachers' subject knowledge).
- **Pedagogy**: Teachers have a foundation of pedagogical skills to be able to apply new training; and they have feedback mechanisms that enable them to reinforce positive learning and correct mistakes (Section Pedagogical skills).
- **Motivation:** Teachers are motivated – whether through external incentives like salaries, promotions, etc. or their own commitment – to attend school and lessons regularly, to try to improve their teaching, to take part in learning opportunities and to apply new knowledge when they get it (Section Teacher motivation and attendance).
- **Context**: Teachers have access to sufficient materials, their class sizes are not too large, and the social and political context does not prevent the adoption of new teaching practices (Section Contextual factors that influence the quality of teaching and learning).

This section of the report examines these assumptions in turn in order to understand how likely it is that the TOC for in-service training will be realised in practice. It draws on data from both the quantitative and qualitative baseline studies conducted in 2014 and 2015. Some basic background information on the teachers is provided in Table 9.

Table 9 Teacher background characteristics

- …age is 37 years.
- …teaching experience is 12 years. However, there is a large variation in teaching experience, ranging from less than one year (10th percentile of teachers) up to 36 years (90th percentile of teachers).
- …work experience in her current school is about five years.

and

- …teachers are more likely to teach both the lower primary Grades 1, 2 and 3 and upper Grades 4, 5 and 6 than to specialise in either the lower or the upper grades.

- …only 18% are female.
- …the majority (67%) hold an NCE qualification.
- …48% reported receiving in-service teacher training during the last two years.

4.1   Teachers' subject knowledge

For pupils to be able to learn while in the classroom, teachers must have sufficient knowledge of the subject they are teaching. Recent studies from sub-Saharan Africa, including for some states in Nigeria, find that frequently teachers do not have 'adequate 'working knowledge' of the subjects they teach' and do not have 'a sufficient level of literacy to read for information from one or more sources, to integrate information, and to summarise it in a form, either written or verbal, that can be presented to students or used in the planning of lessons' (Johnson 2010; Johnson and Hsieh 2014; OPM 2015).

The quantitative baseline survey establishes levels of teacher subject knowledge in English, maths and science, and of teachers' knowledge of how to assess pupils' academic progress prior to the start of the TDP. As part of the qualitative research, teachers and other respondents were also asked about the issue of teachers' subject knowledge and whether they saw it as a constraint to their effectiveness as teachers. The aim was to understand whether they acknowledged issues around subject knowledge and had any strategies for dealing with them. A full list of evaluation questions is presented in Table 10 below.

Table 10 Evaluation questions on teacher subject knowledge

What are current levels of teacher subject knowledge on the primary school curriculum in English, maths and science?	Quantitative (TDNA)
Are there any differences in subject knowledge between treatment and control groups of teachers, and by gender?	Quantitative (TDNA)
Do teachers, head teachers, LGEA officers and TDP TFs understand the issues around teacher subject knowledge?	Qualitative (interviews and FGDs)
How do teachers with poor subject knowledge manage in the classroom? Do teachers themselves, head teachers, LGEA officers and TDP facilitators have strategies or ideas for ensuring that teachers have the subject knowledge they need?	Qualitative (lesson observations, interviews)

4.1.1   Measuring teacher subject knowledge

The estimates of teacher subject knowledge come from a TDNA administered at examination centres to the head teachers and three teachers sampled from TDP treatment and control schools. Drawing from Johnson and Hsieh (2014), the TDP TDNA covered Grade 4 level subject knowledge in English, maths and science, and also tested teachers' ability to assess and monitor pupils' academic progress. The TDNA had four parts, as described below and in Table 11. The TDNA instrument is explained in more detail in Section 3 (Volume II) of this report.

Table 11 Mapping of TDNA topics, exercises and questions

English	Reading for factual information, interpreting words, phrases or sentences, writing a model letter in English
Maths	Addition, subtraction, multiplication, division, fractions, decimals, time, measurement, unit conversions, reading graphs, square roots, exponents
Science	The lifecycle of insects, changes in weather, functioning of the human digestive system, measurement, the process of evaporation, forms and sources of energy
Assessing and monitoring pupils' academic progress	Analysis of pupil tests scores, including making simple graphs to monitor performance, short assessment, pointing out the strengths and weaknesses in each letter. Commenting on the following: purpose, organisation, grammar, spelling and punctuation *These results are examined in the following section on teachers' pedagogical skills.*

Source: TDP baseline survey (October/November 2014), TDNA instrument.

4.1.2   TDNA levels of achievement

To examine differences in teacher subject knowledge, four achievement levels were defined for the GEP TDNAs (Johnson and Hsieh 2014), and these were used for the TDP TDNA too (Table 12). **Achievement Level 1** captures teachers who have 'sufficient professional knowledge' (TDNA score 75%–100%): that is, they meet the benchmark minimum knowledge threshold and are considered to be effective in the classroom. At **achievement Level 2** are teachers who have 'near-sufficient professional knowledge' (TDNA score 50%–74.9%) and who would benefit from some in-school support and in-service training to make them effective in the classroom. **Achievement Level 3** includes teachers who have 'emerging professional knowledge' (TDNA score 25%–49.9%) and who, to be effective, would require a combination of school-based in-service training and more fundamental professional development. Finally, teachers at **achievement Level 4** (TDNA score 0%–24.9%), have limited professional knowledge and would need substantial and sustained training and support in order to become effective in the classroom.

Table 12 TDNA levels of achievement, descriptors and score ranges

Level 1	Sufficient professional knowledge	75<=score<=100
Level 2	Near-sufficient professional knowledge	50<=score<75
Level 3	Emerging professional knowledge	25<=score<50
Level 4	Limited professional knowledge	0<=score<25

Source: (Johnson and Hsieh 2014)

Note: Scores signify percentage of questions correctly answered

4.1.3   Results: Teachers' subject knowledge in English, maths and science

Table 13 shows that levels of teacher subject knowledge in English, maths and science are low: the average TDNA score for science is 21%, for English it is 23%, and for maths it is 45%. Female and male teachers perform similarly in English (average score of 22%, compared to 23%) and in science

(average score of 23%, compared to 22%), but female teachers perform significantly worse than male teachers on maths (average score of 43%, compared to 45%) in the three states even though this difference is relatively small. By comparison, the ESSPIN composite survey conducted in 2014, which covered six states – Jigawa, Kaduna, Kano, Enugu, Kwara and Lagos – found that female teachers performed significantly better than male teachers on English and maths, but these gender differences are driven by female teachers in the southern states and are not present in the northern states (De and Cameron 2015). There are no significant differences in average TDNA scores for English, maths or science between teachers in treatment and control schools, which suggests that teacher subject knowledge levels across the two groups is balanced.

Table 13 Teacher and head teacher subject knowledge: % of correct answers

Teacher and head teacher subject knowledge (logframe Outcome Indicator 1.3)

TDNA scores (% correct answers, max score 100%)

English	23.1	22.8	23.4	23.2	21.9	1158
Maths	45.1	44.8	45.4	45.4*	42.7	1158
Science	21.7	21.2	22.2	21.5	22.7	1158

Source: Quantitative baseline survey (October 2014), TDNA. Note: (1) Estimates are for teachers and all head teachers; (2) statistically significant differences between groups are marked with asterisks: *significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

The TDNA finds that a large majority of teachers do not have sufficient or near-sufficient subject knowledge to teach English, science or maths effectively. Applying the four achievement levels (as given in Table 12), it is evident that teacher subject knowledge is very weak across all three subjects, and more so in English and science than in maths (Figure 7).

Only 0.1% of teachers have **sufficient subject knowledge** in science and 0.4% (5 out of 1,158) in English. The group of teachers with sufficient subject knowledge in maths is larger at 8% (90 out of 1,158), but this still means that fewer than one in 10 teachers have sufficient subject knowledge of maths to be considered effective in the classroom. The group of teachers that have **near-sufficient subject knowledge**, meaning that they could with some targeted support and training move into the group of teachers with sufficient knowledge, is also very small. For English only 5%, and for science only 4%, of teachers have near-sufficient knowledge to be effective in the classroom. This compares to a much larger group for maths, for which 33% of teachers have near-sufficient knowledge. There are large groups of teachers with only **emerging subject knowledge** for all three subjects: 43% of teachers for maths, 42% for English and 33% for science. Furthermore, the groups of teachers who have **limited professional knowledge**, and who without extensive and continuous training and support are unlikely to be considered effective in the classroom, comprise 63% of teachers for science and 53% for English. Although for maths the group of teachers with limited subject knowledge is notably smaller (17%), this still means that nearly one-in-five teachers in the treatment and control schools are unlikely to be able to teach maths effectively without extensive and continuous training and support.

Figure 7 Teachers' subject knowledge by level of achievement
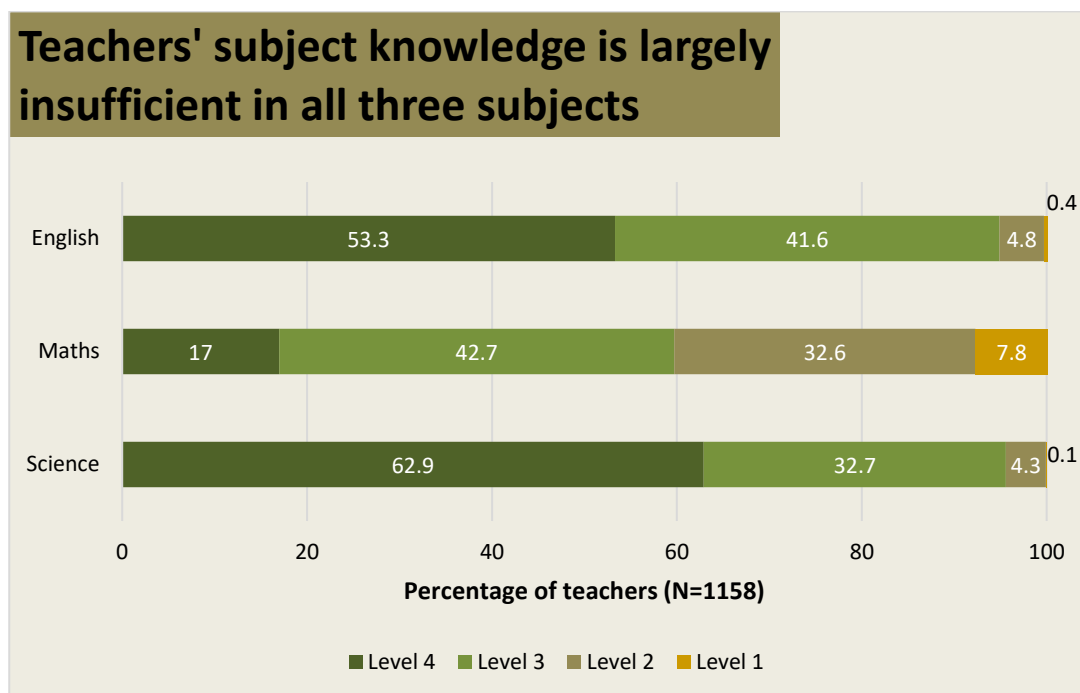
Further examination of teachers' subject knowledge shows that performance is significantly correlated across the three subjects. That is, if a teacher does relatively well on one subject she also tends to do well on the other two subjects.[27,28] The reverse is also true: teachers who perform relatively poorly on one particular subject tend to do relatively poorly on the remaining two subjects. State-level baseline results for teacher subject knowledge are discussed in   below and are available in more detail in the individual state reports (De, Pettersson, *et al*. 2015a; De, Pettersson, *et al*. 2015b; De, Pettersson, *et al*. 2015b).

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[27] Correlation coefficients for maths and English, and for maths and science, TDNA scores are significant, and are about 0.6 in both cases.

[28] The TDNA was administered in English and therefore there is a possibility that it not only assesses subject knowledge and ability to comprehend pupil progress but, to some extent, teachers' English language skills too. The maths section would be relatively unaffected by this, as items were numerical, with minimal instructions (in English). The English exercises aimed to assess subject knowledge of English and needed to be administered in English. For the science and pupil assessment exercises, the language could potentially be an issue in that these items might seem like tests of language competency in English, rather than tests of knowledge of science or ability to assess pupils. Nonetheless, the official medium of instruction in Nigeria is English from Grade 4 onwards (Federal Republic of Nigeria 2004), and thus teachers would be expected to understand the basic assessment instructions in the TDNA and to be able to answer questions in English.

- Teacher subject knowledge is weak in all three states
- But teachers perform relatively better in maths than in English and science in all three states:
    - the average score in English is 28% in Katsina, 22% in Jigawa and 19% in Zamfara;
    - the average score in science is 23% in Katsina, 22% in Jigawa and 20% in Zamfara; and
    - the average score in maths is 49% in Katsina, 45% in Jigawa and 40% in Zamfara.
- These results, although not directly comparable, are roughly in line with those from previous assessments of teacher development needs. The average TDNA score for maths was 41%, and for English it was 18%, in Jigawa in 2010 (Johnson 2010) and in Katsina in 2014 the average maths TDNA score was 48%, and for English 8% (Johnson and Hsieh 2014).

These impact evaluation survey results are representative of the TDP treatment and control populations. However, these populations are not in themselves representative of the three Phase 1 TDP states more broadly.

For a detailed discussion of the baseline results at state level see the individual state reports (De, Pettersson, and Morris 2015; De, Pettersson, *et al*. 2015a; De, Pettersson, *et al*. 2015b).

4.1.4   Perceptions about teachers' weak subject knowledge

Given these findings on teachers' limited subject knowledge in the quantitative survey, a key question for the qualitative research was whether teachers themselves, head teachers, LGEA officers, and TDP TFs, recognise this as a constraint and have strategies for dealing with it.

There was varied but limited acceptance among respondents that lack of subject knowledge was an issue. Their responses may, to some extent, reflect a sense of embarrassment or a reluctance to criticise. Nevertheless, the lack of awareness of the problem or of possible solutions is potentially problematic for attempts to improve teachers' subject knowledge. Some TFs acknowledged that teachers' limited ability in English was sometimes a problem during training, or that their teachers were difficult to train because they lacked the expected foundational skills or were simply 'lazy' and 'incompetent'.

Some LGEA education secretaries claimed that there was no problem with teachers' subject knowledge. One had observed teachers with limited subject knowledge writing incorrect information on the blackboard, and argued that teachers undertaking their NCE by distance learning (compared to the classroom-based NCE) resulted in worse teachers. Some head teachers claimed that there was no issue with teachers' subject knowledge because they had all, or nearly all, achieved NCE, while others admitted this was not a major concern for them. According to one respondent 'there are some teachers that cannot read out their names even though they have an NCE' [TDP teacher], including some who have obtained their NCE fraudulently. One described a teacher who lacked subject knowledge and was 'not willing to learn even when you offer to teach him' [head teacher]. This teacher was placed in the first grade mathematics class to teach 'some basic things'.

Few teachers acknowledged their own difficulty in terms of subject knowledge, although one mentioned using a dictionary to look up difficult words and one visited teachers at other schools 'to teach me the subject I don't know' [non-TDP teacher]. In the teachers' constraint ranking exercise, teachers tended to place 'poor teacher subject knowledge' in the middle – meaning they were fairly ambivalent about the severity of the problem.

Teachers did, however, discuss the poor subject knowledge of *other* teachers, especially those who had undertaken their NCE by distance learning. One teacher had been warned not to mix up lower

case and upper case letters in English, but did not appear to have been offered any further support to strengthen his writing ability. Some teachers acknowledged that they may not understand everything in the curriculum, particularly if they were asked to teach a subject that was not their usual subject. They complained of not having books to research subjects they did not know, or they said that in such cases they did not receive support from other teachers or the head teacher. To some extent it is reassuring that in these cases, teachers had at least identified a need for support, but they still did not receive the support they wanted.

> *In my own opinion there is a need to address poor subject knowledge of the teachers as well as the curriculum, to be honest with you 35%–40% of teachers have issues and challenges with their subject knowledge, you will find such cases in a seminar and workshops, many of us cannot present a simple thing, there is a need to boost the confidence of the teachers and make them more effective. [TDP teacher]*

When asked whether it was common for teachers to be teaching something incorrectly because of a mistake in the text book, one teacher said 'something of this nature happened to one of our former teachers, and at the end the teacher realised he was just teaching rubbish because of that mistake in the text book' [TDP teacher]. Teachers do not appear to have either the subject knowledge or pedagogical skills to deviate from the textbook, even when the textbook may at times be inappropriate or contain errors.

Table 14 Summary of strength of evidence underpinning assumptions relating to teachers' subject knowledge

Subject knowledge: Teachers have the foundational subject knowledge to be able to understand training and curriculum materials		
• Teachers have the foundational subject knowledge to be able to understand training and curriculum materials	No	Strong
• Teachers, head teachers, and LGEA officials understand the challenges encountered by teachers regarding their subject knowledge and demonstrate possible ways to address this	Mixed	

4.2   Pedagogical skills

Teachers spend a considerable proportion of their time in the classroom and their teaching practices influence pupil learning (Bayer *et al*. 2012). This makes it important to understand if teachers use teaching practices that are conducive to pupil learning in the classroom. There exists some literature which discusses a set of teaching practices considered to characterise effective teachers and classroom practice (Siraj *et al.* 2014; Westbrook 2013).[29] These practices include: organising teaching time well; having shared and clearly stated goals, with guidance on how to achieve them; using homework; creating a positive classroom climate; managing pupil behaviour effectively; using group work for collaborative and peer learning; using personalised learning based on pupil needs; appropriate use of teaching resources; using open-ended questions to develop a deeper understanding of concepts and to encourage pupils to participate; using continuous assessment of pupil academic progress; and using plenaries at the end of lessons to summarise and repeat key

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[29] These pedagogical practices have been provided as examples only and are not mapped to the pedagogical techniques delivered through TDP's training.

learning points. A related question is whether teachers have the knowledge required to analyse and monitor pupil academic progress in order to address learning needs. Evidence from selected states in Nigeria find that teacher knowledge in this area is generally weak (Johnson and Hsieh 2014).

The TDP will provide in-service training to promote effective teaching practices aimed at moving from predominantly teacher-centred to more pupil-centred practices. To understand teaching practices before the TDP begins, and to be able to measure any changes in teaching practices over time that are attributable to the programme, the baseline quantitative survey examined teaching practices at the baseline using timed classroom observations in the quantitative survey. In addition, qualitative lesson observations were conducted, in which observers watched a lesson, made qualitative notes on the ways in which teachers and pupils interacted, and later interviewed the teacher about his or her methods of teaching. This section seeks to address a range of questions around pedagogy and assessment (see Table 15).

Table 15 Evaluation questions on pedagogy

What are current levels of teacher effectiveness in the classroom?	Quantitative and qualitative (lesson observation)
Are there differences in teacher effectiveness in the classroom between treatment and control groups of teachers, and by gender?	Quantitative (lesson observation)
What are teachers' own perceptions about effective methods of teaching?	Qualitative (interview)
What proportion of teachers knows how to assess and monitor pupils' academic progress?	Quantitative (TDNA)
Is there any difference in the proportions of teachers who know how to assess and monitor pupils' academic progress between treatment and control groups, and by gender?	Quantitative (TDNA)
What are teachers' own perceptions about their pupils' performance? What do teachers say about how they monitor and assess pupil performance?	Qualitative (interview and FGD)

4.2.1   Results: Teachers' positive interaction with pupils during lessons

The baseline survey included observations of TDP or control group teachers teaching a lesson. The observation recorded the proportion of time that the teacher was engaged in interaction that was classed as effective (see Section 3 in Volume II for details of the classroom observation instrument).

The average teacher in TDP treatment and control schools involved pupils in positive interaction for 24% of the total lesson time (Table 16). This suggests that there is considerable scope to introduce more effective teaching practices in the classroom. Male teachers on average engaged pupils in positive interaction for a larger proportion of total lesson time than female teachers, significant at the 10% level. There were no significant differences between teachers in treatment and control schools.

Table 16 Teachers' positive interaction with pupils during lessons (mean estimates)

Teacher pedagogy (logframe Outcome Indicator 1.1)

| Time teacher involves pupils in positive interaction during lesson (% of total lesson time) | 24.2 | 24.0 | 24.5 | 24.5* | 22.9 | 1054 |

Source: Quantitative impact evaluation baseline survey (October 2014), classroom observation. Note: (1) The above indicators include teachers as well as head teachers who teach a primary class regularly; (2) statistically significant differences between groups are marked with asterisks: *significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

Additional analysis of teachers' pedagogical skills is discussed in Volume II, including teachers' use of praise and reprimands, teacher resources in the classrooms, presence of multi-grade teaching, and teachers' actions at the end of the lesson.

4.2.2   Results: Lesson length and loss of instructional time

An additional result of this baseline survey relates to lesson length: most lessons tended to be considerably shorter than the standard 35 minutes.[30]   discusses the loss of instructional time due to reduced lesson length, which in many cases is substantial, and has consequences for pupil learning.

The amount of instructional time pupils receive from their teachers affects the amount of learning that can occur during a lesson (Robinson, Lloyd, and Rowe 2008). In the three states,

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[30] The lesson length criterion used here has been borrowed from the ESSPIN logframe, which considers a standard lesson to finish within five minutes of a standard 35-minute lesson (i.e. lesson length is 30–40 minutes) (Cameron 2015a).

the average lesson length was 28 minutes, and a large proportion of observed lessons (more than 45%) were shorter than within five minutes of a standard 35 minute lesson (Figure 8), implying large losses in instructional time.

Around 15% of lessons were 18 minutes or shorter, equivalent to losing nearly half of the lesson time, which implies a substantial loss of instructional time, with serious implications for pupil learning. This loss of instructional time is additional to losses due to teachers being absent from school and to teachers who are present at school and scheduled to teach but who are not in the classroom (classroom absenteeism, not measured by the survey).

About 54% of lessons met the criterion of lasting for at least 30 minutes; and some of these lessons may have even also lasted longer (the classroom observation instrument was designed to stop recording classroom activities after the 36th minute).

Figure 8 Lesson length is frequently (much) shorter than expected
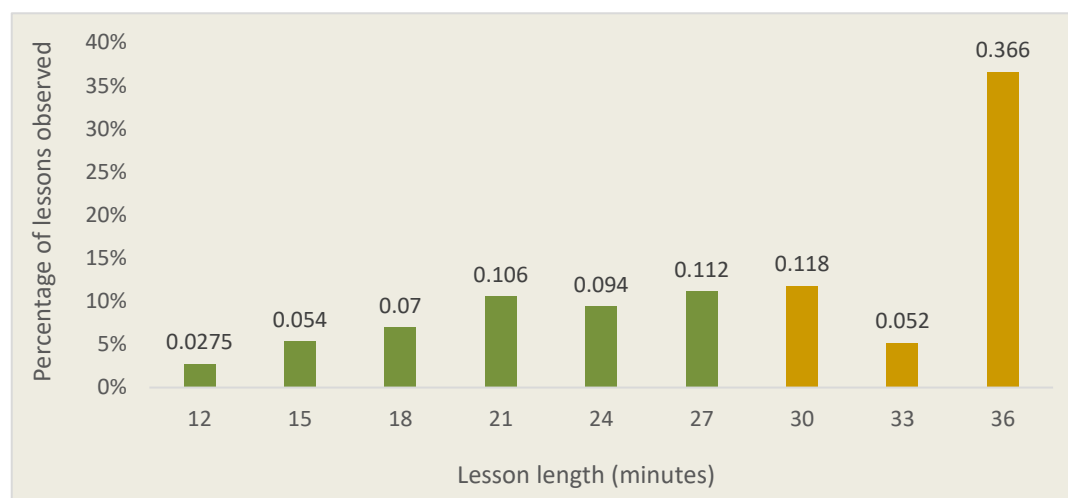
Source: Quantitative impact evaluation baseline survey (October 2014), classroom observation. Note: (1) N=1,054 all teachers and head teachers who teach; (2) excludes lessons that were nine minutes or shorter.

Lessons that were shorter than nine minutes (fewer than 2% of lessons observed) are excluded from Figure 8 and the analysis. This was done to address the possibilities that in some cases teachers may have shortened lessons because they were being observed or because of enumerators having arrived after the start of the lesson. Excluding these cases did not significantly alter the results presented above. Moreover, the average lesson length of 28 minutes is consistent with analysis carried out by this report's authors on classroom observation data for northern Nigerian states covered by the ESSPIN composite survey, which found an (unweighted) average lesson length of 26 minutes in Jigawa, 28 minutes in Kaduna and 30 minutes in Kano.

contains a summary of state-level baseline results for teacher pedagogy in Jigawa, Katsina and Zamfara.

- Teachers spent a mere 24%–25% of total lesson time in positive interactions with pupils in all three states.
- However, the majority of teachers appear to create a positive classroom climate:
  - In Zamfara, 88% of teachers used praise more than reprimands, in Jigawa 78% of teachers did so and in Katsina 72% did so.
- The average lesson length was 28 minutes in all three states, which is shorter than the standard of 35 minutes and indicates a notable loss of instructional time

These impact evaluation survey results are representative of the TDP treatment and control populations. However, these populations are not in themselves representative of the three Phase 1 TDP states more broadly.

For a detailed discussion of the baseline results at state level see the individual state reports (De, Pettersson, and Morris 2015; De, Pettersson, *et al*. 2015a; De, Pettersson, *et al*. 2015b)

4.2.3   Teachers' perceptions of their pedagogical skills

In the qualitative study, teachers were in many cases unable to articulate in any detail what methods they use for teaching pupils and ensuring that they learn. Exceptions were the use of 'energisers' or exercises to keep pupils interested; using a container of soil to demonstrate what soil is; and using song to capture pupils' interest and help them to learn faster. Some of these methods may have been picked up during the early TDP training, or in Jigawa from ESSPIN, or other forms of pre- and in-service training, or may even have been the result of teachers' own initiative. As with subject knowledge, teachers who had gone through NCE were often considered to have 'all the necessary methodology'.

In particular, teachers did not demonstrate ideas about how pupils learn and about how teachers can respond to different learning levels within the same classroom to ensure all pupils achieve at least a minimum level. When asked about how they would help a pupil who does not understand, some said their pupils were simply untalented; others expressed frustration with having tried different teaching techniques without success; and (perhaps most commonly) some said that they would repeat the same information until the pupil absorbs it. One teacher described a strategy of placing pupils in groups with one 'talented' pupil within each group.

> *INTERVIEWER: Ok, what do you understand by untalented pupils?*
> *TEACHERS: What I understand is when you teach a pupil and he does not understand, honestly we have a few of them that are untalented, they hardly understand.*
> *INTERVIEWER: Like when you give them work, can they do it?*
> *TEACHERS: When you give them work sometimes they can't even write, you have to hold their hands to show them. [Non-TDP teacher]*

> *INTERVIEWER: To what extent do you feel the topics you covered in the lessons you taught previously are well understood?*
> *TEACHERS: I am always happy to revise with the pupils what I taught them, but there are some pupils who never understand what you teach no matter how you teach them.*
> *INTERVIEWER: How do you treat those pupils who never understand?*
> *TEACHERS: I always try my best to gradually get their attention till they understand.*
> *INTERVIEWER: Sir, how do you get their attention?*

TEACHERS: I do that by repeating several times one after the other until they understand what I am teaching them. [Non-TDP teacher]

Teachers spoke mostly in Hausa during lessons, interspersed with sections of English from the textbook. Very few teachers could correctly state the federal government's language policy, which is to teach in the language of the environment, i.e. mother tongue, from Grades 1 to 3 and then in English from Grade 4 onwards. Teachers instead believed that the policy was to teach in English, and were apologetic that they had to switch to Hausa to make the pupils understand. Some teachers said they read everything in English and then repeated it in Hausa, which seemed an inefficient use of instructional time. Some of the teachers' frustration with pupils who were unable to understand a lesson may have been caused by teaching in English, with an emphasis on written English in particular, when pupils were unable to recognise English words in writing or speech. The lesson observations confirmed that there was a large amount of repetition of set phrases in English, usually copied from the textbook onto the board, with pupils copying the same text at the end of the class after having repeated it several times.

Teachers, particularly those who had received training from ESSPIN or TDP, talked about child-centred learning or the 'play way' method, but often seemed to understand this mainly in terms of using imaginative lesson materials, such as money (for mathematics) or water or soil (for science), or of using songs, poems and jokes. Even where teachers had adopted more child-centred methods, they still tended to finish their lessons by writing notes on the board and leaving the pupils to copy them, an activity which took a large amount of time and may have reflected a need for teachers to demonstrate to parents that their pupils are doing something productive in school. In principle, pupils were also supposed to use their notes to prepare themselves for tests and exams, but the notes available for observation by researchers were often scant and indecipherable.

4.2.4   Do teachers know how to monitor and assess pupils' academic progress?

The TDNA test included questions for measuring teachers' (and head teachers') ability to assess and monitor pupils' academic progress (see Section Teachers' subject knowledge above, and Section 3 in Volume II for discussion of items covering this skill). Their ability in this part of the test was weak, the average score being 15%. The average teacher, at the baseline, is unable to correct errors in pupils' work and provide relevant feedback, or to identify learning needs of individual pupils and monitor their academic progress over time. There are no significant differences between teachers in treatment and control schools.

Examining teachers' ability to assess and monitor pupil progress using the achievement levels, the results are even starker. The vast majority (80%) of teachers only have limited knowledge in this area (Figure 9) and answered less than 25% of the questions correctly. At the other end of the range, a mere 0.3% of teachers have sufficient knowledge to assess and monitor pupil performance.

Figure 9 Ability to assess and monitor pupils' progress
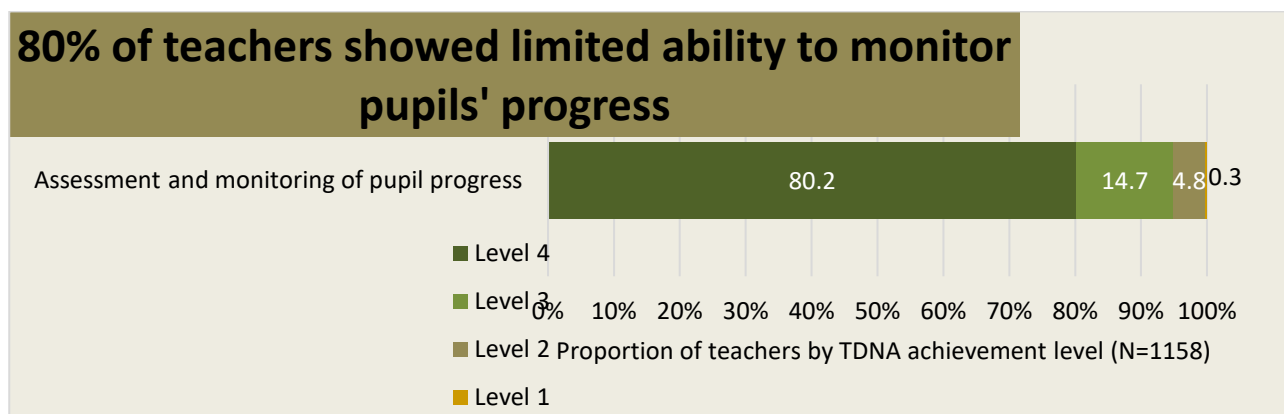
These results are supported by findings from other assessments. In Jigawa in 2010 no teacher was considered to have sufficient knowledge to identify pupil learning problems or use graphs and tables to monitor pupil progress, and in Katsina in 2014 only 0.2% and 1.5% of teachers had sufficient knowledge of how to correct and provide feedback on pupil writing and monitor pupil progress respectively (Johnson 2010; Johnson and Hsieh 2014).[31]

In the qualitative survey, only one of the nine schools was regularly conducting continuous formative assessment in the form of class tests. Elsewhere, feedback mechanisms by which teachers could judge the progress of their pupils were lacking. Teachers claimed to know whether pupils were learning or not from their test or class work. In the classroom observations (both quantitative and qualitative) it was noted that teachers did spend a large amount of time correcting pupils' notebooks. However, in qualitative observations they usually spent very little time checking each notebook before ticking it and handing it back. Some teachers noted the difficulty in marking work properly when classes are very large:

If you collect 137 books you can't mark them all within one period [head teacher].

From observation of notebooks of pupils, and from talking to the pupils about these notes, it appeared that they did not know how to write letters or the meaning of what they had written. This was the case even when teachers had marked the work as correct. This suggests that teachers are either unable to pay proper attention to the pupils' work, for example because of large class sizes, or lack the knowledge to mark the work appropriately, or both. They may also not have the pedagogical skills and subject knowledge needed to support pupils whose learning levels are low relative to the expectations set in the curriculum.

Table 17 Summary of strength of evidence relating to teachers' pedagogical skills

Pedagogy: Teachers have adequate pedagogical knowledge to be able to apply new techniques learnt in training; and they have feedback mechanisms that enable them to reinforce positive learning and correct mistakes		
• Teachers have a foundation of pedagogical knowledge on which they can base further development	No	Strong
• Teachers know how to monitor and assess pupils' progress		Strong

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[31] These comparisons of results across the different studies should be caveated by the fact that the instruments, although similar in structure, had a somewhat different scope and contents.

4.3 Teacher motivation and attendance

The TDP TOC argues that TDP materials and support can improve teachers' motivation by raising teacher self-esteem (McCormick 2014). The evaluation framework (EDOREN 2014) elaborates on this mechanism, suggesting that teachers' motivation is increased as teachers feel more effective and see their pupils' learning outcomes improve. However, this link in the TOC assumes that teachers are motivated (externally through salary, promotions, etc. or internally through their own commitment) to attend school and lessons regularly, to try to improve their teaching, to take part in learning opportunities and to apply new knowledge when they get it. The quantitative baseline survey administered a teacher motivation instrument to the sampled teachers in both treatment and control schools in the three states, with a sample of 1,077 teachers. In the qualitative baseline study, 27 teachers were asked to talk about their motivation in FGDs and one-on-one interviews. This section presents the results of the teacher motivation scale, and a discussion of teachers' own narratives about the causes and effects of (low or high) motivation. It then examines teachers' attendance in school and in the classroom, using official attendance registers consulted in schools during the quantitative baseline survey, observations during the qualitative study, and teachers' and head teachers' views on the issue. This section uses quantitative and qualitative baseline data to examine teachers' existing levels and drivers of motivation as well attendance in school and classroom (Table 18).

Table 18 Evaluation questions on teacher motivation

What are the current levels and drivers of teachers' motivation?	Quantitative (teacher motivation scale) and qualitative (teacher FGDs, head teacher interviews, case study interviews and self-directed photography)
Does teachers' motivation vary between states, between male and female teachers, and between control and treatment groups?	Quantitative (teacher motivation scale)
What are current levels of teacher absenteeism from school?	Quantitative (teacher interviews and attendance registers)
Is there any significant difference in teacher absenteeism from school between treatment and control groups of teachers, and by gender?	Quantitative (teacher interviews)
Why are teachers absent from school and classrooms?	Qualitative (teacher FGDs, head teacher interviews, case study interviews and self-directed photography)

4.3.1 Current levels of teacher motivation

For the purposes of the baseline survey, teacher motivation is defined as the propensity of teachers to start and maintain behaviours that are directed towards fulfilling their professional goals, and in particular towards achieving better learning outcomes for the school's learners, based on Bennell and Akyeampong (2007) and Hoy and Miskel (1991). As part of the quantitative baseline study a motivation instrument was developed, relating to different aspects of motivation, that could be

administered verbally to teachers (see Volume II and Cameron, 2015b). The resulting data were used to calculate an overall motivation score for each teacher.[32]

This score is useful for comparing different groups of teachers (Figure 10). Teacher motivation is significantly higher for NCE-qualified teachers than for teachers who do not have an NCE qualification, and is higher in Katsina than in Jigawa or Zamfara. Although significant, these differences are small in scale: for example, the mean motivation score in Zamfara is less than 0.3 standard deviations below that in Katsina. Differences between male and female teachers, and between Jigawa and Zamfara, are small and statistically insignificant. There is also no significant difference in overall teacher motivation scores for the TDP treatment and control groups.

Figure 10 Overall teacher motivation score by qualification, gender and state
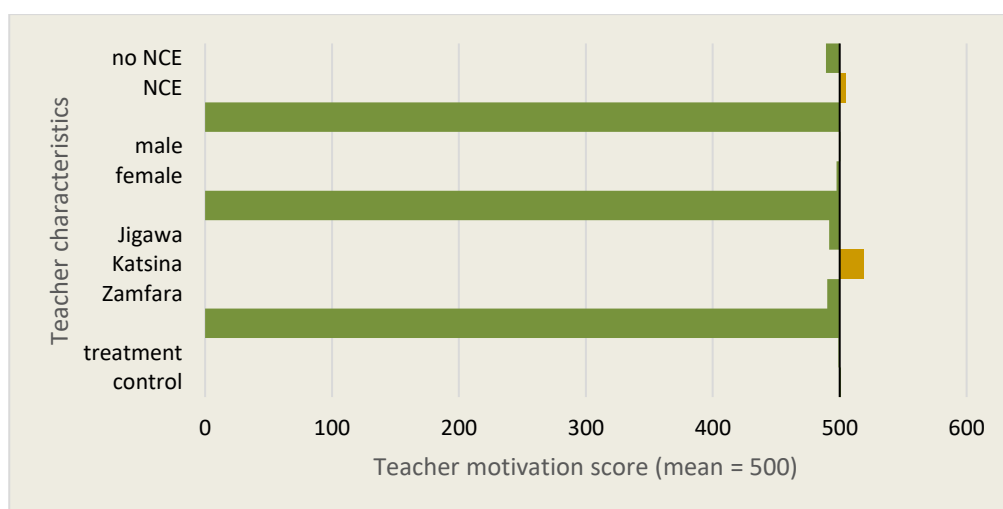
Examining the relationship between overall teacher motivation and teaching experience, classroom pedagogy, absenteeism and subject knowledge provides interesting insights. There is no significant correlation between teacher motivation and experience, teacher motivation and positive interaction with pupils in the classroom or teacher motivation and (self-reported) absenteeism (Figure 11, see Cameron (2015b) for full results). However, the relationship between overall teacher motivation and performance on each part of the TDNA – English, maths, science and ability to monitor and assess pupils' academic progress – is small, though positive and significant. [33]

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[32] The score is normalised – calculated in such a way that ensures it has an average (mean) of 500 and a standard deviation of 100.

[33] The lack of correlation between the overall teacher motivation score and absenteeism and positive interaction in the classroom is somewhat surprising and warrants further exploration. In subsequent TDP research, multivariate regression models could be fitted to explore the data in more depth. Questions for further research may include: are pupil learning levels higher for pupils taught by more motivated teachers? Why are NCE-qualified teachers and teachers with better subject knowledge more motivated? Further data collection as part of the TDP endline survey will make it possible to answer questions of causation with greater confidence by testing, for example, whether pupil outcomes improve faster if they are taught by more motivated teachers.

Figure 11 Teacher motivation scores and teacher background characteristics
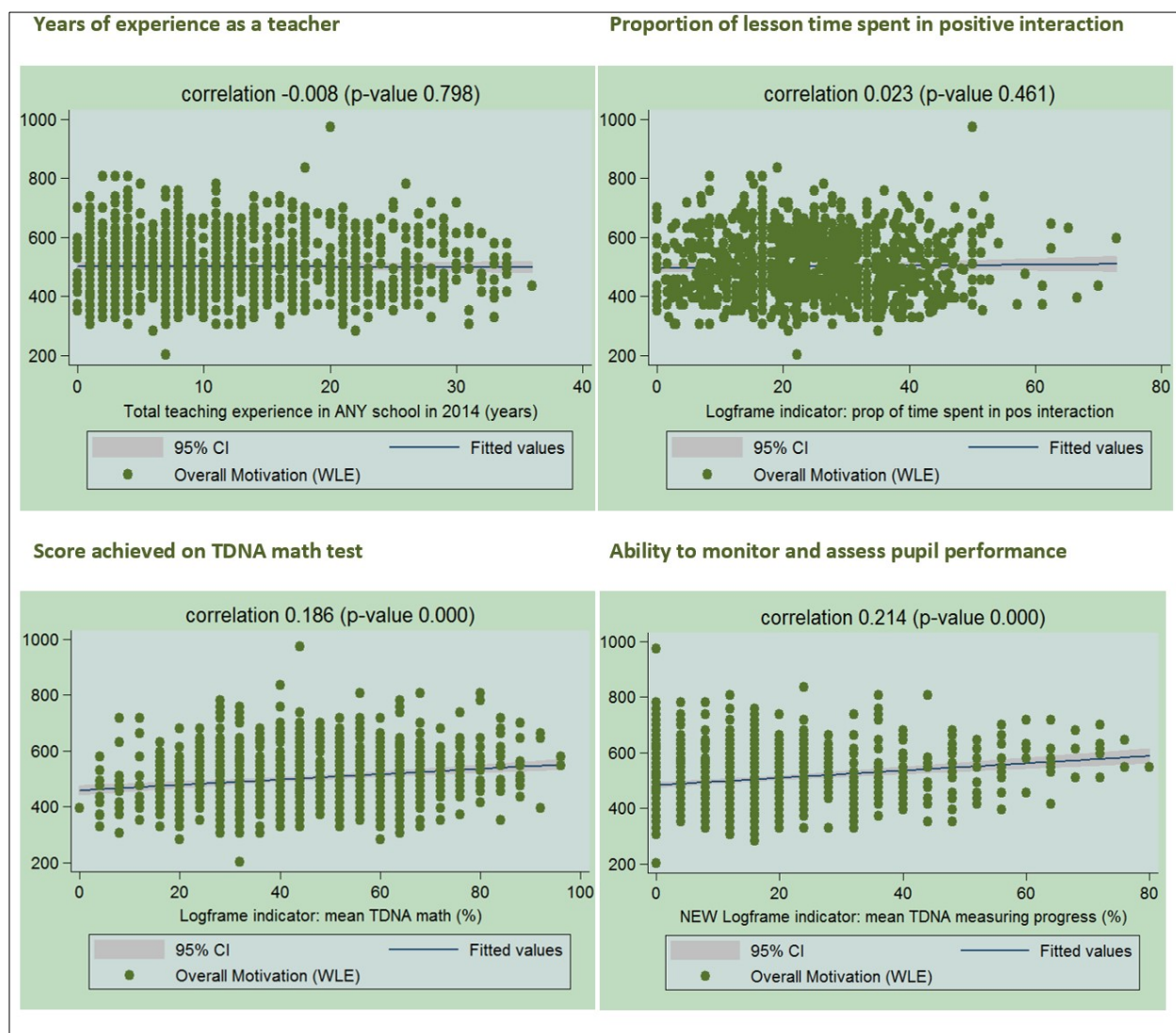
4.3.2   Drivers of teacher motivation

The idea that receiving training would improve motivation through teachers' sense of their own effectiveness echoes insights from the theory of, and studies of, the psychology of *self-efficacy* (Bandura, 1977, cited in Fernet *et al.*, 2008). Self-efficacy, defined as the perception of one's own ability to have an effect on desired outcomes, is thought to be important in motivation. Individuals who do not see themselves as able to affect the world around them are unlikely to expend much effort in trying to do so. If teachers' pedagogical methods are a major factor undermining their self-efficacy, and self-efficacy is in turn important for motivation, then improvements in pedagogy would be likely to improve motivation. If, on the other hand, other external factors – for example, poor infrastructure or lack of learning resources – mean that teachers will not achieve visible gains in effectiveness even after adopting new pedagogical practices, then the intervention is less likely to affect their motivation. Similarly, if their motivation is kept low by factors such as erratic pay or rules around promotion and transfer, then the effects of the intervention on motivation are likely to be limited.

Teachers in several cases talked about feeling demotivated when pupils do not understand.

Teachers: What discourages me is that when you teach a child he claims he knows but when you ask him about it he will just stand and say nothing even though some may give you what you taught, but this is frustrating because you may sometimes take a long time to explain but the children are not understanding. It is so annoying at times, especially when you give out your possible best.

Teachers gave varied descriptions of their attitudes towards the teaching profession, ranging from those who described teaching as a noble profession that advanced society, to those who accepted teaching jobs because they were unable to find anything else. One teacher explicitly became a teacher because it allowed him to carry on a side business.

I decided to become a teacher because the job is simple and is not time consuming. I got two appointments from the beginning, that is Nigeria Custom Service and this teaching job, I decided to accept the teaching job because I have a shop and it is not possible for me to mix the customs job and my shop business, but teaching will give me ample time to manage my business. For example, we open this school by 7:00am and close after 1:00pm, this shows that after closing hours I will have time for my family and my business as well. We have holidays unlike other jobs … [TDP teacher]

Some teachers cited respect towards teachers, the idea that teaching is an inherently valuable occupation, and the satisfaction of seeing children learn, as motivating factors – particularly in the absence of a good or regularly paid salary. Teaching was also seen as respectable on the grounds that it is relatively free of corruption compared to other jobs in government, 'a way of getting pure and clean money' [TDP teacher]. However, others refuted altogether the idea that teaching was respected by others in the community, placing the blame on the government's attitude towards teachers or on the fact that they are not well paid. One argued that the teacher was still a respected figure in rural communities, but that in urban areas teaching is just a 'stepping stone' to a better career prospect.

Interviewer: Okay do you see yourself as a primary school teacher less important in society?
Teacher: No, I am very important to society, even though some people might think we are not important, but as far as I am concerned, I am important, for example we are the grass roots, everything depends on us…. [TDP teacher]

I hate teaching because people no longer respect teachers; sometimes security personnel respect students more than teachers. I wish the new government would do something about it. Many services that are not like teaching get more respect and a higher salary than the teaching profession. From the beginning it has been my father who was interested in the profession, not me. I am doing it because I don't have any other job [Case study teacher]

In the future, how do you see your career progressing?
Teacher: Well, we are praying for a way out regarding the teaching occupation, because a teacher is considered as nobody, this is because a teacher can spend like three months without salary and still going to work. [TDP teacher]

Teachers described a career path for a primary school teacher that would take them first to the position of head teacher, and then to a position in local government and eventually to the SUBEB. Even among those who described teaching as an important and respected profession, many seemed

to want to leave teaching itself to reach these supervisory roles, which clearly held higher status. As noted above, some were pursuing further studies, sometimes with a view to advancing out of primary school teaching.

When asked about demotivating factors, teachers predominantly talked about salaries, working conditions, the lack of learning resources and poor infrastructure. Salary complaints were never far from the surface, although increases in salary in Katsina had, reportedly, led to an increase in applicants to become teachers, and an increase in the proportion with NCE qualifications. As well as salary payment problems, teachers said they were demotivated by the lack of promotion or perceived unfairness in promotions; arbitrary transfers; the poor state of infrastructure and teaching resources; over-crowded classrooms; irregular attendance of children; and 'untalented' pupils. Teachers could be discouraged by inspection that was too harsh, but positively motivated by inspection that was encouraging or constructive. Lack of textbooks was sometimes cited as a demotivating factor, although researchers also saw schools with large numbers of unused textbooks locked up in the head teachers' office.

In some cases an explicit causal link was drawn by teachers between demotivating external factors – family problems or delayed salary – and teachers' inability to ensure that pupils learn. Unmotivated teachers, it was suggested, would turn up and teach, but not 'effectively or zealously', and without bothering about whether pupils are actually learning or not.

> *Teacher: If a teacher has a lot of issues like family problems this will affect his performance and when he comes into the school he will not be very active so he will only teach as a duty not minding whether they understand it or not. [TDP teacher]*

> *Teacher: Honestly it is not always, especially when there is no salary and you don't have anything that will help you to fuel your bike and what to give to your family, when you come to school without a penny in your pocket you even hate the job and go to the office thinking, you will not even have the zeal to work well even when the pupils are present. [TDP teacher]*

4.3.3 Current levels of teacher absenteeism

For pupil learning to take place meaningfully and effectively teachers have to be present in the school and classroom, and they have to teach for the intended duration of time. If teachers are absent, instructional time is reduced – with adverse effects on pupil learning (Das *et al*. 2004; Suryadarma *et al*. 2006; Wobmann 2000), and the potential impact of in-service training on teacher effectiveness is weakened. TDP will seek to reduce absenteeism by training head teachers to strengthen SLM. As noted above, the programme also hopes that teacher motivation will improve as increases in pupils' learning outcomes become apparent, and that this in turn will improve teacher attendance (EDOREN 2014). This section examines quantitative data from the baseline survey on the extent of teacher attendance before the start of TDP.[34]

The average level of daily teacher absenteeism over the previous five days, according to the schools' records, was 14% (Table 19). This average conceals large variations in teacher absenteeism across schools. At one extreme, for the 10% of schools with the lowest level of teacher absenteeism, average daily absenteeism during the previous five days was zero, while at the other extreme, for the 10% of schools with the highest level of absenteeism, more than 33% of teachers were absent

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[34] See Volume II for further explanation of indicators.

on average (see supplementary analysis in Annex M of Volume II for details). As these records were observed on announced visits, it is also possible that absenteeism is higher at other times. There is a two percentage point difference in teacher absenteeism between the treatment and control groups, at a 10% level of significance.[35]

Table 19 Teacher absenteeism (mean estimates)

Teacher absenteeism from school records (logframe Outcome Indicator 1.2)

Average daily teacher absenteeism (% of teachers absent)	13.8	12.9*	14.8	330

Source: Quantitative baseline survey (October 2014), school records. Note: (1) The average daily absence rate is computed over the previous five working days; (2) statistically significant differences between groups are marked with asterisks: *significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

The average daily absenteeism in the three states can be broadly compared to absenteeism results from other studies in Nigeria and in the region, although there are caveats. The studies differ in terms of how absenteeism is defined, how the data are collected (including whether school visits were announced or unannounced), and geographical scope. Nonetheless, these studies help place absenteeism in the three TDP states into context. The TDP design mission in Niger state found that teacher absenteeism ranged from 16% to 29% in three different LGAs (DFID Nigeria 2012). Another study that used unannounced school visits found much lower teacher absenteeism – 3.4% of teachers in Enugu and 2.4% in Kaduna were absent on the day of the survey (Guerrero 2012). This suggests that teacher absenteeism varies markedly across states in Nigeria. Similar rates to our TDP estimate of 14% have been found in other countries in sub-Saharan Africa (see OPM 2015 on Tanzania; World Bank 2012b on Kenya; and Chaudhury *et al*. 2006 on Uganda).

State-level baseline results for teacher and head teacher absenteeism in Jigawa, Katsina and Zamfara are set out in   below.

- Average daily teacher absenteeism is lower in Katsina (13%) than in Zamfara (14%) and Jigawa (15%).

- The most commonly reported reason for absenteeism given by teachers is own or family illness (51%–64%) in all three states.

- Social/religious obligations are more commonly reported as a reason for absenteeism in Zamfara (15%) compared to Katsina (11%) and Jigawa (7%), and late or non-payment of salaries is cited more often in Jigawa (10%) and Zamfara (5%) than in Katsina (1%).

For a detailed discussion of the baseline results at state level see the individual state reports (De, Pettersson, and Morris 2015; De, Pettersson, *et al*. 2015a; De, Pettersson, *et al*. 2015b).

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[35] The effect size is very small (0.05) and as such this difference is likely to be negligible in practice. These differences between treatment and control groups is discussed in more detail in Section 3 (Volume II).

4.3.4   Drivers of teacher absenteeism

The baseline survey asked teachers who had been absent in the previous five days what the reasons for their absence were.[36] The most commonly cited reason was own or family illness (58%), followed by: collecting salary and family reasons (20%); social/religious obligations including attending funerals (10%); late or non-payment of salary (6%); transport (6%); epidemic/disease outbreak (2%);[37] training (1%); and a meeting or event at the LGA or SUBEB (1%).

In the qualitative study, however, researchers found a somewhat different set of reasons. Several teachers combined their teaching work with farming or small businesses outside the school. Most claimed that this did not affect their teaching, because the school day ends around 1pm and teachers can then attend to household chores, farms or businesses. In some cases, such as those quoted below, however, teachers were frank about their jobs or other home commitments or financial problems keeping them out of school even during lesson times. Some teachers had several businesses to supplement their income from teaching. These responses also suggest that teachers may not give much time to their work outside of teaching hours: for example, planning the next day's lessons.

> *Interviewer: How do you balance the farming, your manual work and the teaching job?*
> *Teacher: I am trying my best to give the teaching job my best, these two businesses of manual work and farming are just there to support me, because the teaching salary is not good enough to take of me and my family, my salary is just NGN 11,000 … and remember I have relations and family members that depend on me and sometimes we used to spend about 40 days without salary so with that manual work and farming I will be able to take care of myself and my family.*
> *Interviewer: So do you think your manual work will not affect your teaching job?*
> *Teacher: Maybe farming might affect my teaching job, because during the rainy season sometimes I am absent for one or two days to take care of my farm, plant seeds so that I will not be left behind. [Case study teacher]*
>
> *Teacher: Honestly, sometimes after every two weeks I used to miss like one or two days, this is because of financial challenges, I am not from this community and sometimes I will wake up with only NGN 200, I am a family man, I need to provide for them, so instead of fuelling my motorcycle and coming to school will prepare to stay at home and assist my family with it [non-TDP teacher]*
>
> *Teacher: I was in school throughout last week, just that I used to come late. I have to hustle for what will keep me for the day before coming to school. The reason behind all this is the fact that we don't get our salary on time [TDP teacher]*

Some teachers were undergoing further training or education at the same time as teaching, taking them away from their regular jobs. In most schools, researchers also saw teachers arriving late. Late attendance by female teachers was explained in terms of the expectation that they would prioritise family issues such as illness and childcare over their jobs, however researchers often saw male teachers arrive late too.

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[36] Teachers could give up to three reasons and therefore the categories may not sum to 100%.
[37] This possibly refers to the 2014 outbreak of Ebola in West Africa, including in Nigeria from July to October 2014, which is roughly around the time when this baseline survey was being conducted.

The quantitative survey only measured teacher absenteeism from school, but during the qualitative study researchers also observed teachers present in school but not teaching, sometimes at the same time as one or more classes were without a teacher. This accords with previous evidence from Enugu and Kaduna in Nigeria, and from other sub-Saharan African countries, suggesting that, in addition to school absenteeism, there is also typically a classroom absenteeism problem. In many cases it is substantially higher than school absenteeism and accounts for large losses in instructional time. In Enugu, classroom absenteeism was found to be at 13% and in Kaduna at 6% (World Bank, 2008). Two studies in Tanzania found that 50%–67% of teachers in rural schools, although present at school, were absent from classrooms (OPM 2015; World Bank 2012b),[38] while in Kenya classroom absenteeism was at 40% (World Bank 2012a). Watts and Allsop, 2015, also noted that, until recently, teachers were trained in the NCE programme to see themselves as subject specialists, and they argue that this makes them poorly prepared for teaching in the primary classroom. Teachers' specialised training often does not match the subject that is needed when they are posted to a school, and shortages of teachers can arise in specific subject areas, even when there is not an overall shortage of teachers. One head teacher directly linked absence from classrooms to the late payment of salaries, suggesting that teachers were on a kind of unofficial strike or were severely demotivated.

Table 20 Summary of strength of evidence relating to teachers' motivation and attendance

Teachers are motivated – whether through external incentives like salaries, promotions, etc. or their own commitment – to attend school and lessons regularly, to try to improve their teaching, to take part in learning opportunities and to apply new knowledge when they get it		
• Teachers are intrinsically motivated , to try to improve their teaching, to take part in learning opportunities and to apply new knowledge when they get it	Mixed	
• Teachers are extrinsically motivated to do the same	No	Strong
• Teachers attend school regularly, and are in the classrooms when in school		Strong

4.4   Contextual factors that influence the quality of teaching and learning

It is widely acknowledged that teachers in some parts of Nigeria face a particularly challenging environment in terms of class sizes, school infrastructure, recruitment and transfers, and the social and political context. Past studies have suggested that school characteristics may influence teacher effectiveness (Bennell and Akyeampong 2007; Robinson, Lloyd, and Rowe 2008; UNESCO 2004), and, conversely, that the impact of other investments in education are dependent on the quality of teachers (Hanushek and Rivkin 2006; Yoshikawa *et al*. 2007).

The theory underlying TDP's in-service training component implicitly suggests that these contextual factors will not be severe enough to hinder the quality of teaching and learning. To test this assumption, this section examines teachers' physical, social, and political context, and how it affects their teaching (Table 21). The baseline quantitative survey gathered information about the

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[38] This ignores if a teacher was scheduled to teach or not. Accounting for whether teachers were scheduled to teach, one of the studies found that classroom absenteeism was 66.8% (OPM 2015).

characteristics of the surveyed schools to help understand the environment in which teachers work and how it may limit their effectiveness. The qualitative study also asked teachers about how they deal with aspects such as poor infrastructure, limited resources, and large class sizes, and how they relate to their pupils and the family and community that their pupils come from. The following sub-sections examine each of these questions in turn.

Table 21 Evaluation questions on the context that influences the quality of teaching and learni

What class sizes do teachers have to teach?	Quantitative (interviews and school records)
How do teachers cope with large and multi-grade classes?	Qualitative (lesson observation and interviews)
How are teachers affected by the poor state of infrastructure and resources in some schools?	Qualitative (lesson observation and interviews)
How are teachers affected by recruitment and transfer processes?	Qualitative (interviews)
How are teachers affected by other aspects of the social and political context?	Qualitative (interviews)

4.4.1 Class sizes and multi-grade classes

As shown in Table 22 below, the average PTR is 59:1. This compares to the national PTR of 36:1 in 2011 (UNESCO 2014) and the official policy of 35:1 (Federal Republic of Nigeria 2004). The 10% of schools with the lowest PTRs have 23 pupils per teacher but at the other end of the distribution the 10% of schools with the highest PTRs have 106 pupils per teacher or more. This implies that these latter schools have a severe shortage of teachers, with likely consequences for teacher effectiveness in the classroom.

The average class size is 42 pupils per classroom; early grades (Grades 1–3) constituted 60% of the classrooms observed. The fact that the average class size is lower than the average PTR (59:1) could imply that early grade primary class sizes are typically smaller than upper primary grade class sizes and/or all pupils are not taught at the same time (e.g. double shifts), leading to class sizes being less than the PTR. Finally, pupil absenteeism may also be driving the difference between class size and PTR since class size calculations were based on the number of pupils present in the observed classes on the day of the survey, while PTR was based on the total number of pupils registered in the school. Pupil absenteeism would thus lower the class size on the day of the survey while not affecting the PTR. Treatment schools on average have significantly smaller[39] class sizes than control schools.[40]

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[39] At a 5% level of significance.
[40] The effect size is very small (0.03) and this difference may be considered negligible in practice. These differences between treatment and control groups is discussed in more detail in Section 3 (Volume II).

Table 22 School characteristics: Size, PTR and class size

Indicator	Overall	Treatment	Control	N
Number of teachers employed (Grades 1–6)	12.2	11.9	12.6	330
Number of pupils registered (Grades 1–6)	654.8	614.9	696.6	328
PTR	58.7	58.2	59.2	328
Number of pupils per observed classroom (class size)	41.9	39.6**	44.3	1053
Source: Quantitative baseline survey (October 2014), school records, classroom observation and head teacher interview. Note: (1) Class size data come from the classroom observation instrument; (2) statistically significant differences between groups are marked with asterisks: *significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.				

While it is clear that not all classes are over-crowded, some teachers in the qualitative study described large classes, sometimes in excess of 200 pupils, and talked about the difficulties of teaching in these classes. Teachers sometimes admitted to having lost control of a large class, and complained that it took a longer time to finish a lesson with a large class. Large classes made it difficult for teachers to get to know their pupils and monitor attitudes or behaviour among the pupils that might affect their learning. They also made it difficult to apply child-centred methods that teachers have been trained on. It was not clear that they had any strategies for how to deal with this issue.

> INTERVIEWER: How do you know if they understand or not?
> TEACHER: We do know when some few pupils in the class understand because… they are too many in a class, as you are working a pupil may be beating another while another one is dragging another and you are all alone to control the class. [Non-TDP teacher]

> Even when you try using the child centred approach, due to the overpopulation you find it difficult because they keep making noise. [Non-TDP teacher]

Some schools were operating *de facto* multi-grade classes because of a shortage of classrooms or teachers, but teachers had little to say about how to teach these classes. They appear to have had no support on how to deal with pupils from more than one grade sitting in the same classroom. Teachers detailed using informal methods for multi-grade teaching, such as rotating the grades so that different pupils were sitting at the front during different periods, but researchers did not see these methods effectively put into practice.

Although large class sizes was often cited as a problem, it is also worth noting that during the survey visit there were often far fewer pupils in class than the number registered. Teachers usually attributed this to pupils being kept at home to work on farms during the planting/harvest season. In urban schools, there were also sometimes unused or barely used rooms for IT or libraries, which could have been pressed into service as temporary classrooms if necessary.

4.4.2   Infrastructure and resources

In the quantitative survey, head teachers at 88% of schools reported that their school needed major repairs. In teacher interviews, 70% of teachers agreed with the statement that their school's building was in a 'poor condition', and 33% said they did not have adequate materials to do their job properly. The types of repairs most frequently reported as being needed were: repairs to the school roof or ceiling (68%); repairs of broken windows (65%); repairs of classroom walls (53%); repairs of toilets (52%); repairs of outside walls (30%); and repairs of the playground (21%). In a qualitative constraint ranking exercise, 'inadequate classroom resources' and 'inadequate school infrastructure' were fairly consistently ranked among the worst constraints faced by teachers. Several head teachers also reported that they needed additional resources, in particular additional classrooms, furniture and blackboards. Even though all respondents were told that data were being collected for research purposes only, some degree of 'need signalling' (in anticipation of receiving school resources) may be influencing these responses.

Teachers' own accounts during qualitative interviews suggested that the poor state of infrastructure, shortage of classrooms, and lack of textbooks made teaching difficult and demotivated them. Teachers also claimed to arrive late sometimes because of rain, poor roads, or because they do not have vehicles. Teachers complained about the lack of a teachers' room, forcing them to sit outside during off periods, although in schools that did have teachers' rooms researchers observed that they were often uncomfortable, and were used for storage of furniture or textbooks, and that they were little used by the teachers.

Textbooks were not routinely given to all pupils, but sometimes pupils sat in groups and one textbook was given to each group to share. This was sometimes because there were insufficient textbooks, although in some cases there were textbooks that were not used. During one observation teachers handed out textbooks that looked virtually unused, and pupils were unable to find the correct page number or recognise which part of the page the teacher was talking about. The lack of textbooks was sometimes linked to the style of teaching, with teachers copying extensive notes on the board and leaving pupils to copy these.

4.4.3   Recruitment and transfers

Several teachers described how they became teachers through having relatives or other connections that were able to get them the job, even when some of them lacked the appropriate qualifications. There was evidence that the least competent or least motivated teachers were being posted to remote rural areas as a punishment by LGEAs that were unable or unwilling to discipline them in other ways, or to remove them from service. Teachers suggested that well-connected head teachers could find a way to have a teacher transferred if they took a dislike to that teacher, or in an attempt to settle a conflict between teachers.

> *Teacher: Some few teachers are lazy and they don't want to teach, they are after the salary they will receive.*
> *Interviewer: Do you report those kinds of teachers?*
> *Teacher: Yes, we used to report them to the EO (education officer).*
> *Interviewer: What action does he take usually?*
> *Teacher: He usually talks to them and if all things prove abortive then he will take the issue to the Education Secretary (ES), if that teacher is not careful the ES will post him out to a very remote area. [Case study teacher]*

… once you have a problem here they will transfer you without investigating into the matter, they just transfer at any time, I was even transferred to a village called --- before I was later transferred back to this school were I think I will retire from, even here I was transferred last month but I refused to go [laughs] yes, because my time is almost over why should they play me like a ball. Too much transfer is the only problem we are facing, once the headmaster does not like you he will make a way to transfer you. [Non-TDP teacher]

4.4.4 Social and political context

This section considers the social and political relationships between teachers and LGEA and SUBEB officers, communities, parents, and pupils, in order to understand how these affect their ability to do their jobs, their motivation, and the likelihood of them putting new insights from training into practice.

Some teachers complained that LGEA and SUBEB inspection officers victimised and intimidated them, rather than supporting them. On the other hand, although they faced the risk of transfer, some teachers were reportedly unfazed by the threats of punishment from the LGEA, and often did not appear to be particularly subordinate to head teachers or LGEA officers. LGEA officers had the power to caution teachers or transfer them, but not to remove them from service or deduct pay. Inspectors reportedly 'don't care about what we teach as teachers, they are concerned with the record of work, they will just check our diary and praise us and move on' [TDP teacher].

Teachers alleged that promotions were given unfairly, based on a teacher's political or social connections, rather than seniority. Similarly delays in payment and transfers were sometimes thought to be due to political connections.

… In fact in Nigeria you can hardly see an area where politics has not interfered, but what we experienced for the past two to three weeks is alarming in Zamfara state, our friends and brothers were transferred illegally to different areas, take for example in B---, and you are from B--- and you teach there but because you don't support the ruling party they will post you to a village. [TDP teacher]

Teachers claimed to have a cordial relationship with parents and the community. In practice this seemed to involve varying levels of mutual respect depending on the relative social standing of the teachers and community members. Some teachers lived in the same community as the pupils in their school, while others, particularly in remote areas, travelled from nearby towns. Living in the same area did not guarantee close relationships with parents, but may have played a role. In urban areas, some teachers send their own children to private schools. Overall, most teachers did not always feel they were respected by the community. Despite this, some responses suggest that teachers in rural areas had a higher social standing than most parents, although they could be held to account by more respected or politically connected members of the community, such as village heads and SBMC heads (often the same person). PTA meetings were rarely mentioned, and in one case it was clear that parents were charged PTA fees even though no meetings took place. SBMCs were often mentioned as a place for teachers to interact with parents and the broader community, but in some cases they were inactive.

When asked how they would respond to a father who complained that his child was not learning enough in school, teachers tended to raise points about the importance of parents' own role in ensuring their children attend school regularly and supporting their learning. Similarly, teachers

often blamed pupil absenteeism on farming or other household work, discounting problems such as teacher absence or poor infrastructure that might have deterred pupils from attending school. While valid, these points tend to shift responsibility away from the teacher and on to the parents – who in many cases are likely to be illiterate and have little time to supervise their children – to ensure children learn.

The relationships of teachers to the pupils they teach are also likely to be important for the way that they teach and adopt new training, especially when the aim of the training is to move towards more 'child-centred' forms of teaching. Teachers stressed the need to control a classroom and maintain authority over pupils, by being friendly, telling jokes, using songs, and so on, and sometimes by giving small amounts of money to pupils who answer questions or perform well, but if necessary also by beating or otherwise punishing them. Teachers talked about themselves as being 'a father' to the community, or even as 'parents of the nation', about being a person who steps into a parental role in relation to the pupils in their care, and as having a role in instilling morality, which is valued at least as much as their role in imparting other kinds of knowledge.

> *The advice [for a hypothetical new teacher] is that he needs to show the pupils he is a teacher, he is above them because at times you need to force a child to do something and sometimes you have to beat that child, if he doesn't do that the pupils may decide to disrespect him and turn him into a play toy and that will make them unserious with their studies. [Non-TDP teacher]*

> *I love discipline, it goes hand in hand with teaching, education goes with morality and so if you educate a child without moral value his education is valued less because morality is very important in any society you live, this made me choose to be a teacher. [Non-TDP teacher]*

Teachers' role in ensuring good behaviour could sometimes result in the exclusion or embarrassment of pupils from poorer or less supportive home backgrounds, for instance those who arrive at school with dirty uniforms, or without notebooks. In one case teachers' authority apparently extended to being able to use pupils for farm work.

> *Teacher: Sometimes we call the dirty learners to come forward and warn others not to come to school like that again, by bringing the dirty pupils out, they feel embarrassed and then you will find out that many will strive hard to wash their uniforms because of the fear of being called in front of the assembly. Another we conduct inspection, check their nails and their body to make sure they are clean, we conduct inspection every week.*
> *Interviewer: Don't you think by embarrassing the dirty ones will affect their mood that day?*
> *Teacher: We want to discipline them, we don't want them to copy that behaviour, though they will feel rejected and sometimes even cry a lot, but that really helps us a lot, and tell them to watch him as a dirty boy, many of them will not try it again.*
> *Interviewer: We notice how teachers whip pupils in this school, how often do you do that and why?*
> *Teacher: Yes, we are just trying to make them stop coming late and sometimes it is the way of settling them when they fight each other [Case study teacher]*

> *Interviewer: What about the school land, do you plant some things for your use as a teacher?*

> *Teachers: Yes, teachers utilise the school land and also use pupils to work for them in the farm…*

One teacher recognised that pupils' attendance in the school is in effect voluntary, and that 'we cannot continue to beat the learners and punish them', because their parents will not force the child to go to school if he or she does not want to. In other cases teachers were deterred from punishing pupils because parents would complain. Though they were expected to take on a semi-parental role by parents and the community, teachers were not always able to do this because of the number of students they were in charge of.

Teachers encounter problematic political relationships with LGEA and SUBEB officers as part of the processes of inspection, recruitment, promotion and transfer. This tends to affect their motivation negatively and may have resulted in less competent teachers being placed in certain schools, particularly remote rural ones. Their relationships with communities and parents are apparently cordial, but generally not on equal terms; other than through powerful members of the community, such as village heads, there appears to be little accountability of teachers to the community. Their relationships with pupils reflect their perceived traditional role as moral guardians and notions of controlling a classroom that are potentially difficult to reconcile with the putative move towards child-centred learning, and may mean that training on child-centred methods is taken up in a superficial way, rather than as a fundamental adjustment in the relationship between pupils and teachers.

Table 23 Summary of strength of evidence relating to contextual factors influencing teaching and learning

Context: Teachers have access to sufficient materials, their class sizes are not too large, and the social and political context does not prevent the adoption of new teaching practices

• **Class sizes** are small enough for teachers to teach effectively	No	Strong
• **Infrastructure and materials** are adequate for teachers to teach effectively	No	Strong
• **The social and political context** in which teachers work permits engagement with parents, communities and pupils	Mixed	

4.4.5 Linkages between various aspects of teacher effectiveness

Additional analysis was conducted to examine linkages between three key aspects of teacher effectiveness (subject knowledge, pedagogy and absenteeism). The detailed analysis is reported in Volume II but some noteworthy results are discussed below.

First, correlations between TDNA scores across the three subjects shows that teachers who do relatively well on one subject also do relatively well on the remaining two subjects, and vice versa. Second, teachers with higher TDNA scores also demonstrated better skills at assessing and monitoring pupils' academic progress. However, by contrast, teachers demonstrated an almost uniformly low proportion of total lesson time (22%–25%) in positive interaction with pupils, irrespective of their subject knowledge scores, thus strongly suggesting that all teachers, irrespective of their achievement level in the TDNA, would benefit from in-service training in pedagogy. Teachers with higher subject knowledge scores also demonstrated marginally lower rates

of absenteeism. Finally, the proportion of teachers who hold an NCE is larger among teachers with sufficient (maths)[41] subject knowledge (85%) than among teachers with near-sufficient subject knowledge (78%) or limited subject knowledge (72%).

Overall, the available evidence suggests that levels of subject knowledge and knowledge of assessment and monitoring of pupil progress are very low. However, there exists a small group (8%) of relatively more effective teachers who on average have relatively stronger (albeit still weak) maths, English and science subject knowledge, and ability to assess and monitor pupil progress, and somewhat lower absenteeism. However, this relatively more effective group of teachers still displays a limited use of effective teaching practices, similarly to the other three groups of teachers.

4.4.6   Relationships between teacher effectiveness and pupil learning levels

The theory underlying the outcome-to-impact link in the TDP in-service training model is that pupils learn more when they are taught by effective teachers. This section discusses the relationship between pupil learning levels and aspects of teacher effectiveness measured by the baseline survey, namely subject knowledge, ability to assess and monitor pupils' academic progress, pedagogy and teacher motivation (the graphs presented in Figure 12 show some of these results).[42]

Based on a simple bivariate and multivariate regression analysis, no significant relationship was found between pupils' learning scores in English literacy and teachers' TDNA English scores; pupils' scores in numeracy and teachers' TDNA maths scores; or pupils' scores in scientific literacy and teachers' TDNA science scores. Similarly, pupils' learning levels in the three subjects were not significantly associated with teaching practices in the classroom, as measured by the proportion of lesson time teachers spend in positive interaction with pupils. In contrast, pupil learning scores in all three subjects were positively and significantly correlated[43] with teachers' ability to assess and monitor their pupils' academic performance. Overall, more than half of the variation in school performance in pupil knowledge cannot be explained by observed teacher-level characteristics measured in this survey.

However, it is noteworthy that a significant amount of the variation in pupil learning comes from differences in pupils' own family backgrounds (as measured by an asset index) and community-level characteristics (as picked up by LGA fixed-effects), both of which relate to aspects of school performance that the quantitative survey is not measuring.

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[41] This analysis was only carried out for performance bands in maths because the other two subjects (English literacy and science) did not have adequate samples sizes (especially in the top performance band) to permit reliable testing of differences in means.

[42] School-level pupil and teacher variables were constructed to examine the direction and significance of correlations between selected aspects of teacher effectiveness and pupil learning.

[43] At a 1% level of significance.

Figure 12 Teacher effectiveness and pupil learning levels: Simple bivariate regression analysis
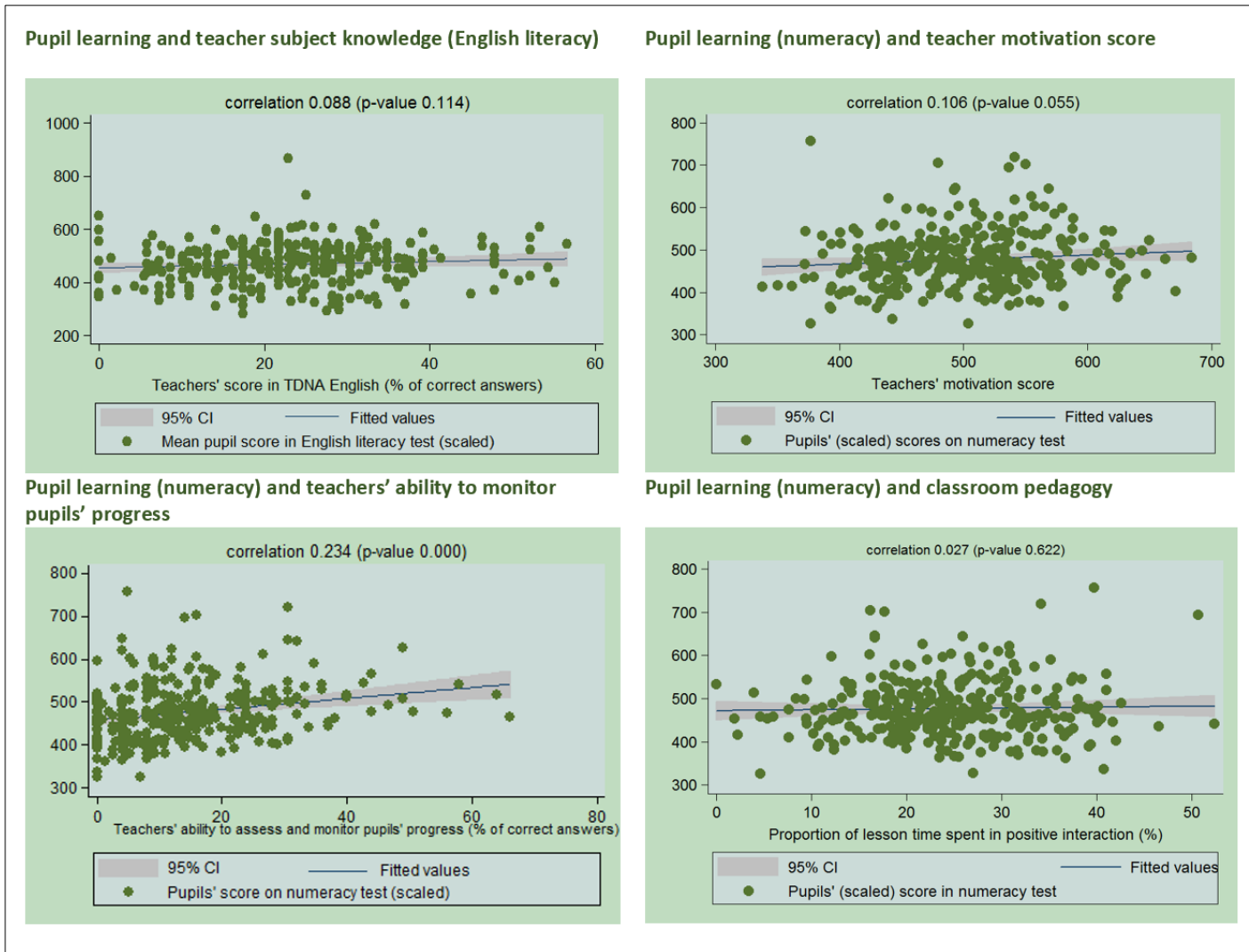
The fact that teacher knowledge, pedagogy and ability to assess pupils has very low (or maybe even zero) predictive power does not necessarily invalidate the importance of teaching quality for improved pupil learning. The low correlations and explanatory power could merely reflect the fact that it is very difficult to accurately measure teacher knowledge and ability – a perfectly accurate measure of teacher knowledge, pedagogy and ability might have stronger predictive power. However, characteristics like teacher knowledge, pedagogy and ability are inherently noisy and often unobservable measures, and consequently as the level of noise increases, the coefficient value tends towards zero. In sum, even though this analysis found no significant relationship between pupils' learning scores and some characteristics of teacher effectiveness, it does not conclusively invalidate the importance of teaching quality for improved pupil learning, and, rather, highlights the challenges involved in measuring characteristics like teacher knowledge, pedagogy and ability.

5 School leadership and management (SLM)

Many factors influence teacher effectiveness. These factors include SLM and school characteristics (Bennell and Akyeampong 2007; Robinson, Lloyd, and Rowe 2008; UNESCO 2004). There is also a growing body of research examining the 'school system', which focuses on the complex relationship between school-level dynamics and the accountability, political economy, and broader socio-economic context within which a school is embedded (Moore 2015; Lemke and Sabelli 2008). The focus of this section of the report is guided by the TDP TOC (Figure 2 above), and draws on data collected in both quantitative and qualitative surveys. It examines the SLM practices and other behaviours of head teachers, and the factors that explain these.[44]

5.1 Assumptions relating to SLM in the TDP TOC

Effective SLM is crucial in raising school performance. Literature shows that school functionality before the start of education quality improvement programmes is an important factor in determining the ability of schools to take advantage of and benefit from interventions (Hopkins, Harris, and Jackson 1997). Some important aspects of SLM and the creation of a school environment that is conducive to learning are captured by this baseline survey. These include support and supervision provided by head teachers to teachers; whether and how head teachers manage pupil and teacher absenteeism; and if there is an active SBMC. This quantitative analysis is complemented by a rich picture of what it is like to be a head teacher in the schools visited as part of the qualitative research.

SLM is relevant to the evaluation of the TDP in two ways. First, teachers cannot be assumed to be motivated to invest the time and energy required to learn and adopt new teaching practices without appropriate leadership and management from head teachers. Effective SLM is therefore an important factor in determining whether TDP training (output) leads to improved subject and pedagogical knowledge (outcome), and whether this knowledge is applied through improved teaching practices (intermediate impact). Second, the TDP plans to train head teachers on issues relating to SLM.

Effective SLM is therefore both an implicit assumption in, and an explicit outcome of, the TDP TOC. Three headline assumptions relating to SLM were thus identified on the basis of the qualitative evaluation matrix (Annex A, Volume II) and thematic analysis of the data. The following sections examine whether each of these assumptions hold, assess the strength of evidence, and break down the assumptions into their main constituent parts to allow for more nuanced interpretation.

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[44] The scope of this report does not extend to an assessment of education system governance and accountability at the state or federal level, or to an in-depth analysis of parental perceptions that may influence SLM.

Table 24 Summary of assumptions tested regarding SLM

Assumption 1	Head teachers are either **motivated or incentivised** to identify, incentivise and influence the positive teaching and management practices that TDP promotes	**Quantitative** (head teacher interviews on inspectors, SBMCs); **qualitative** (mostly KIIs and FGDs with head teachers, TDP/non-TDP teachers, LGEA, SUBEB)
Assumption 2	Head teachers have the **ability** to identify, incentivise and influence the positive teaching and management practices that TDP promotes	**Quantitative** (lesson observations, teacher interviews); **qualitative** (mostly FGDs and KIIs with head teachers, TDP/non-TDP teachers, LGEA, SUBEB)
Assumption 3	Head teachers are able to exercise **effective management of school infrastructure and resources** to facilitate the adoption of the positive teaching practices that TDP promotes	**Quantitative** (interviews on infrastructure, repairs); **qualitative** (mostly head teachers, LGEA, SUBEB tools)

5.2 Head teachers' motivation and incentives to identify, incentivise and influence teacher behaviour

Head teachers need to be either motivated or incentivised to identify, incentivise and influence the positive teaching and management practices that TDP promotes. At best, without such motivation or incentives head teachers have no reason to align their leadership and management of their teachers and schools with the objectives of the TDP. At worst, head teachers may encounter countervailing incentives that actively undermine the adoption of TDP. This section discusses two groups of accountability actors (SUBEB, LGEA and inspectors; and community and parents) that may be expected to influence head teachers' incentives, and, finally, it addresses the issue of head teacher motivation.

5.2.1 SUBEB, LGEA and inspectors as accountability actors

SUBEBs and LGEAs are the government institutions that head teachers report to. Thus, they might be expected to be influential actors in incentivising head teachers. Most contact between the SUBEB/LGEA and head teachers takes place through inspection visits. In the quantitative survey, some 28% of head teachers reported that their school was visited more than three times per month by school inspectors, 58% that their school was visited two or three times per month, and 14% that school visits occurred once per month or less (Figure 13).[45] There were no significant differences in regard to any of these SLM or external support results across the treatment and control schools. These findings broadly match the experience of the nine head teachers in the qualitative study: the

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[45] These findings regarding the frequency of school inspections stand in sharp contrast to international practice. For example, the OECD TALIS survey, which collates data from 34 countries, found that on average only 9.3% of lower secondary education school head teachers reported having their teachers formally appraised by external individuals or bodies twice or more a year (OECD 2014). The frequency of formal appraisal of *schools* (rather than *teachers*) by external individuals or bodies may be higher than this if such visits are made without involving the appraisal of teachers. Moreover, a comparison of figures regarding frequency of visits in high- and low-income countries may be misleading, since high-income countries are more likely to have data infrastructure that enables remote monitoring/ongoing appraisal that reduces dependence on in-person visits by external bodies.

one head teacher who had not received an inspection in the current school term (i.e. in more than two months) was based in a rural and relatively poorly performing school:

This term we didn't have any inspection team, the last one was done last term … You find out that nearby schools lack class rooms resources, no good infrastructures, the officials doesn't visit the school and the teachers regularly. [Head teacher]

Figure 13 Frequency of school inspections

Frequency of school inspections last academic year (% of schools)

- Once a month or less — 14%
- Two or three times a month — 58%
- More than three times a month — 28%
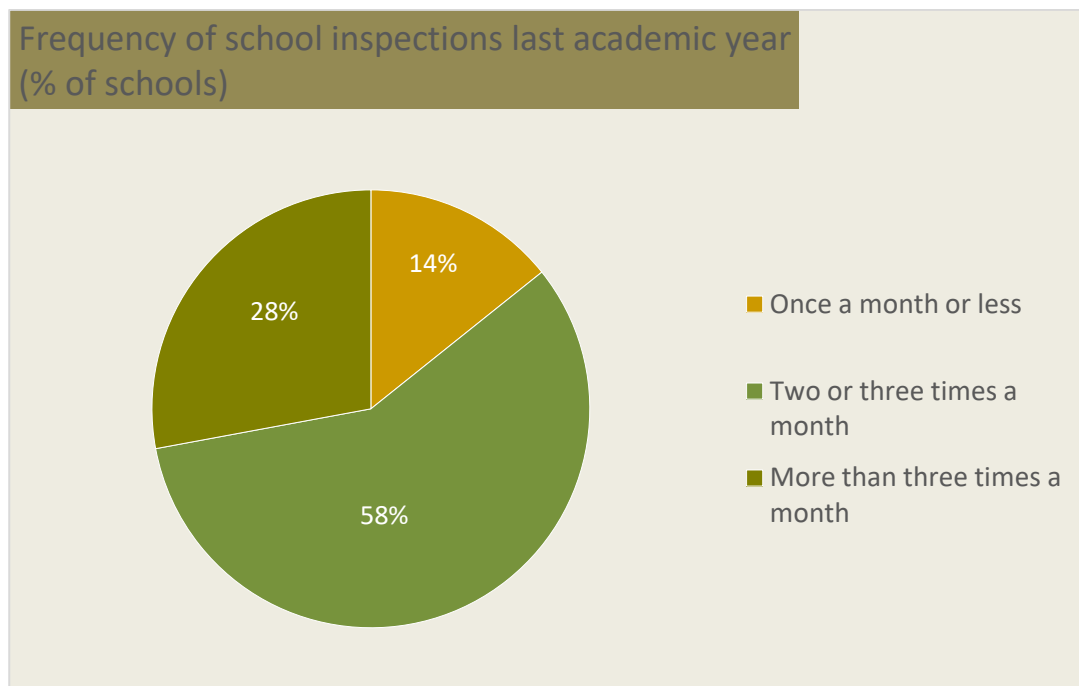
However, in most cases there was limited evidence that these inspection visits incentivised improved performance of the head teachers in a major way, for several possible reasons.

The information collected by inspectors was often too 'shallow' to provide an informed basis for assessing quality of teaching (routine inspections, unlike the relatively rarer full-school inspections, focus on checking records, such as the teacher and pupil school attendance register and the visitors book rather than lesson observations). In most cases, head teachers' examples of feedback from LGEA inspectors included raising issues of low attendance and cleanliness, and to a lesser extent corrections of subject knowledge rather than pedagogy. Records checked by inspectors were occasionally misreported or deliberately manipulated to give a misleading impression of school performance (for example, entries in one teacher attendance register were forged and in another were filled in at mid-morning).

A significant majority of head teachers interviewed during the qualitative study complained that LGEAs did not follow up on inspection through the provision of feedback to head teachers or responding to head teachers' requests for advice or support. This tended to be more the case in rural schools. In such a school one head teacher noted that inspectors provide 'no feedback. They only report that they came to such-and-such a school and this is what they saw and write it on a notebook. That is all'. In another school a head teacher stated that inspectors 'wrote a report but we have not heard any feedback from them'.

In a minority of cases, head teachers shared teachers' complaints that the critical and public manner in which inspectors give feedback damages head teacher motivation, thereby undermining any

positive impact. A head teacher described how the inspectors 'decided to victimise us: these minor things are what really discourages many of us. Instead of the inspectors making corrections for us, some of them end up intimidating us'. Some well-connected head teachers allegedly use their political connections to resist LGEA officials' attempts to discipline them. In one case, the reverse happened: politically active LGEA officials allegedly transferred teachers to remote rural postings due to their membership of an opposing political party.

In one instance, inspectors who were unfamiliar with child-centred learning practices advised against the adoption of related teaching techniques, such as the use of multimedia, thus disincentivising the head teacher's efforts to support TDP. A head teacher noted that whilst SUBEB inspectors 'always discouraged us to use TDP materials … because they are not trained, on the other hand whenever some LGEA officials come they will encourage us to make use of TDP materials, because they are trained and are involved'.

Head teachers in a minority of schools – which tended to be based in urban areas – reported more constructive relationships with the LGEA. One head teacher noted:

> *What motivates me is how supervisors visit to see how the work is done … we see that all what we are doing is being appreciated. … If you are facing any problem you write and send it to them and they will come to see how the problem can be solved. – Head teacher*

Another head teacher noted:

> *I am just very lucky whatever I reported they will follow it up and take action against it. –* Head teacher

In a 'low-performing school', the head teacher noted that drastic action was not taken until the SUBEB chairman, rather than general inspectors, visited the school. The head teacher described that when the chairman found only seven out of 15 teachers were at the school, 'he was very angry, very angry then he gave out directives to withhold their salaries, and they succeeded in withholding their salary for three months, after sometime he posted them out to another school and replaced them with other teachers from another school'. The lack of previous action by the LGEA may be explained by a perception of the disempowerment of senior LGEA officials. For example, one official in an LGEA mentioned that it was previously 'the responsibility of the LGEA to employ, to discipline, to promote all the Level 1–6 teachers, but it is now the responsibility of the SUBEB'. There was some variation in LGEA officials' perceptions of their formal responsibilities and powers, even within the same states, which suggests that confusion may undermine LGEAs' attempts to incentivise positive head teacher behaviours.

Despite these causes for scepticism, most LGEA officials maintain that they are willing and able to take appropriate action to punish head teachers for poor performance. The 'sticks' that LGEA officials claim they can use to influence head teacher behaviour include disciplinary committees, demotions, and suspension of salaries, though they admit that these are rarely used and there was little evidence from head teachers or teachers that such measures had been taken.

There is therefore strong evidence that, despite regular inspection visits, in most cases SUBEBs and LGEAs do not significantly incentivise head teachers to identify, incentivise and influence the positive teaching and management practices that TDP promotes.

5.2.2   Community and parents as accountability actors

Communities and parents are the second group of accountability actors that may be expected to influence head teachers' incentives. Communities generally have inputs into SLM through representation on SBMCs. Nearly all schools (99%) had an SBMC, and 92% of schools reported an SBMC meeting in the current term or over the preceding vacation. Community or SBMC members were not interviewed as part of the qualitative study, however some common themes relating to SBMCs did emerge from interviews with head teachers, teachers and officials.

SBMCs and PTAs were generally spoken about by head teachers and government officials as a means to address low pupil enrolment and attendance.[46] The quantitative study found that 75% of head teachers reported pupil absenteeism problems to the SBMCs, which were praised by head teachers for their efforts:

> *During break, some pupils may decide not to come back on time and stay in town to loiter round, the SBMC created a committee that will ensure that the pupils are back to school on time* – Head teacher

> *During SBMC meetings we normally discuss issues related to pupils' absenteeism and we normally advise the parents to stop sending their children to almajiri school* – Head teacher

> *The SBMC created a team of the youth in this community to help the pupils cross the main road every morning and after closing hours* – Head teacher

Teachers and head teachers did not report SBMCs taking an interest in the quality of teaching or learning outcomes of students, which suggests SBMCs do not effectively hold head teachers to account on the basis of school performance. This is noteworthy given that one of the key tasks for SBMCs is to 'challenge bad management and make head teachers and teachers accountable for poor performance' (ESSPIN, n.d.). This may be because SBMC meetings tend to be organised by head teachers, who therefore see SBMCs as a resource to be drawn upon rather than as a mechanism for making them accountable to the local community. Indeed, one head teacher noted that SBMCs were 'responsible' for important elements of SLM, rather than for ensuring his positive performance:

> *During the SBMC training, parents are told that it is their responsibility to take care of the school, it is the parents' responsibility to send their children to school, it is the responsibility of the village head and whoever is responsible for the town to supervise its development. SBMC is an organisation responsible for community and school. – Head teacher*

Parents in one rural community had decided to stop sending their children to school because they were frustrated with the lack of progress their children had made in English. The fact that they took such drastic action suggests that this community in particular did not feel they were able to hold the school to account – whether through SBMC or other means – to improve standards.

5.2.3   Head teachers' internal motivation

The assumption described above outlines two broad ways in which head teachers can be motivated: either through external incentivises to influence teacher behaviour in the way TDP promotes, or

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[46] SBMCs were also spoken about in terms of mobilising finances or in-kind support to maintain school infrastructure or resources. This function is discussed in more detail in Section Management of school infrastructure and resources on 'Management of school infrastructure and resources'.

through their intrinsic motivation to do so.[47] Whereas the previous two sections dealt with external incentives, this section addresses internal motivation.

Head teachers generally reported the same sources of low motivation as teachers (see Section Teacher motivation and attendance). Common complaints included dilapidated school infrastructure, inadequate teaching resources, parents not adequately supporting their children with food and resources, and external pressures such as farming and hawking preventing pupils from attending school. Additional but rarer complaints unique to head teachers included: teachers not being responsive to the head teacher's feedback (particularly relating to teacher absenteeism); their lack of control over the recruitment of teachers, who tend to lack appropriate subject and pedagogical knowledge despite having the relevant formal qualifications (SSCE, NCE, B.Ed.); and delayed or low salary payments that demotivate the teacher workforce.

However, a minority of head teachers reported being motivated by support given by the community, either to the school or personally to the head teacher (such as gifts of clothes, food or medicines). Two head teachers, both of whom happened to be based in better resourced urban schools, also reported being motivated by contact with the LGEA, such as through school inspection visits. These head teachers were noticeably more proactive when it came to managing teacher and pupil behaviour.

There is therefore mixed evidence on whether head teachers' intrinsic motivation to influence teacher behaviour compensates for the lack of accountability mechanisms or appropriate incentive structure.

Table 25 Summary of strength of evidence underpinning assumptions relating to head teachers' motivation and incentives

Head teachers are either **motivated or incentivised** to identify, incentivise and influence the positive teaching and management practices that TDP promotes

• **SUBEB and LGEA inspectors incentivise** head teachers to identify, incentivise and influence the positive teaching and management practices that TDP promotes	Strong
• **SBMCs** and other community actors **incentivise** head teachers to identify, incentivise and influence the positive teaching and management practices that TDP promotes	Moderate
• Head teachers are **intrinsically motivated** to identify, incentivise and influence the positive teaching and management practices that TDP promotes	Mixed

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[47] In practice, 'external incentives' and 'internal motivations' may overlap and interact. For example, certain individuals may be intrinsically motivated by social status or respect. However, social status is determined by a set of external factors. In this sense, external incentives and internal sources of motivation may be considered more a spectrum of influences on head teacher performance, rather than two distinct categories. For the purposes of this evaluation, external incentives cover proximate factors that are consciously designed and implemented by others in order to influence head teacher behaviour. Internal sources of motivation refer to the set of factors that head teachers themselves report as influencing their own behaviour.

5.3 Head teachers' ability to identify, incentivise and influence teacher behaviour

For the TDP TOC to hold, it is not sufficient for head teachers only to be *incentivised or motivated* to identify, incentivise and influence teachers to adopt the positive teaching practices that TDP promotes. Head teachers also need to have the *ability* to identify, incentivise and influence such change. This section examines three ways head teachers may have this ability: through monitoring, and providing advice to, teachers; through authority delegated from the LGEA/SUBEB; and through innovative ways of rewarding and disciplining teachers that do not rely on LGEA/SUBEB's delegation of authority.

5.3.1 Head teachers' monitoring of, and advice to, teachers on content, pedagogy and behaviour

Head teachers must be able to identify teacher behaviour and performance in order to incentivise and influence the positive teaching practices that TDP promotes. Without this ability, head teachers cannot distinguish between 'positive' and 'negative' behaviour and apply the appropriate SLM approaches to encourage and discourage these respectively. Information regarding teacher behaviour and performance is mostly collected through the attendance register and lesson observations.

In the quantitative survey, the large majority of head teachers (80%) reported carrying out lesson observations during the previous two weeks (Figure 14), suggesting that head teachers are supervising teaching.[48] Teachers also reported having their lessons observed on a fairly regular basis and spoke positively of the feedback they received. Examples of feedback discussed during the qualitative research included correcting spellings or subject knowledge mistakes, encouraging teachers to praise pupils who answer questions correctly, encouraging silent pupils to answer questions, increased use of teaching aids, and comparing lesson execution against the lesson plan (if one exists). In only one instance was there agreement between the head teacher and teachers that the head teacher's advice was regularly ignored.

However, such feedback on lesson observations will only result in positive change where the content of the advice is appropriate. While the quantitative survey found head teachers' TDNA scores to be statistically significantly higher[49] than teachers' scores, the head teachers' absolute TDNA scores (25% items correctly answered) could still be deemed as 'emerging professional knowledge'. There was no significant difference in pedagogical scores between head teachers and teachers. Given this finding of the quantitative baseline and qualitative observations, there is little reason to believe that head teachers have significantly better pedagogical or subject knowledge than the teachers that they are meant to be providing feedback on.

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[48] There were no significant differences in any of the indicators shown in Figure 14 between TDP treatment and control schools.
[49] At a 5% level of significance.

Figure 14 SLM practices, based on head teacher self-reported data
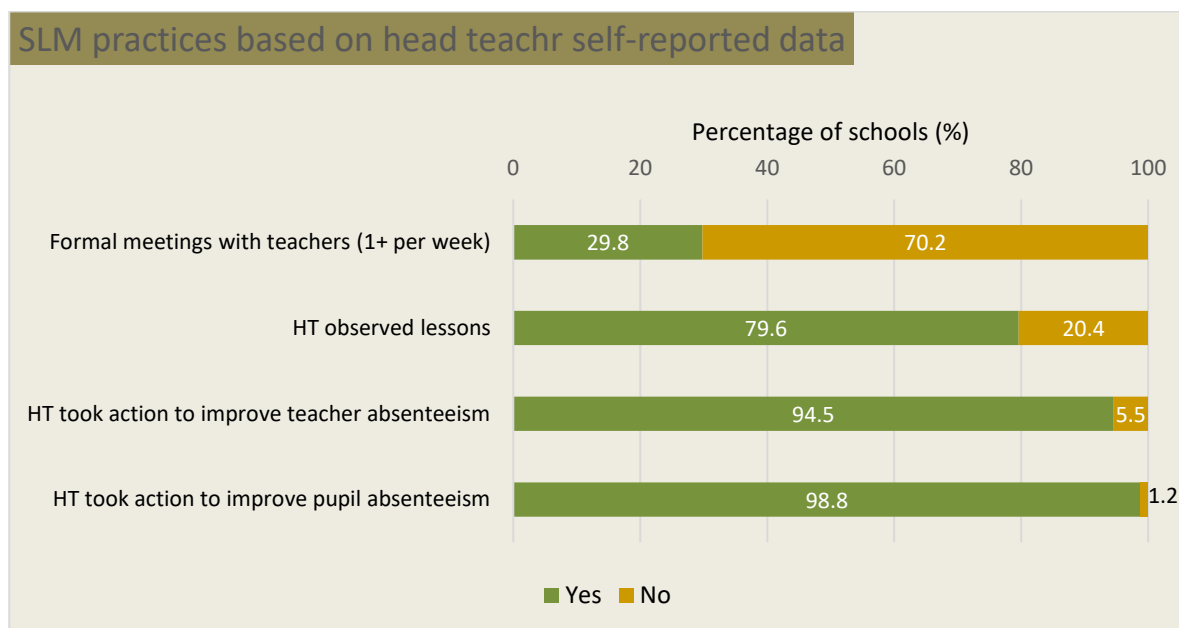
In the three states, 30% of head teachers reported holding formal meetings with all or a group of teachers once a week or more frequently (casual meetings are not included). The most common topics discussed in these meetings were: teacher absenteeism and punctuality (70%); pupil absenteeism (63%); teaching practice and pedagogy (45%); teachers' professional development (26%); parents and the community (15%); individual pupil needs (13%); materials (9%); school building and repairs (5%); teachers' pay and salaries (3%); and training (2%).

Almost all head teachers reported taking action to reduce teacher absenteeism (95%) in the last academic year (no evidence was sought by data collectors to substantiate head teachers' responses). The reported actions taken to reduce teacher absenteeism were: discussing with the teacher(s) concerned (69%); monitoring the attendance book and following up on absences (47%); insisting on written absence requests (41%); the completion of a movement book during school hours (30%); addressing pay-related grievances (10%); addressing childcare/maternity related issues (5%); addressing a lack of teaching materials (2%); and addressing issues related to school infrastructure and conditions (1%).

However, teacher behaviour observed in every school visited during the qualitative research revealed that there still exists a significant number of teachers who are absent from classrooms for large parts of the school day, despite these teachers being present at the school. The fact that this remains the case suggests that the above actions taken to reduce teacher *classroom* absenteeism are largely ineffective and therefore raises doubts about head teachers' ability to influence teacher behaviour without recourse to stronger 'carrots' and 'sticks'.

5.3.2   Reward and discipline: Head teachers' formal authority

Where informal feedback and advice is insufficient to influence teacher behaviour, head teachers may need to resort to using more concrete 'carrots' and 'sticks' to reward successful, and discipline under-performing, teachers. However, a majority of head teachers feel that they are not empowered by government to do so, especially in regard to their ability to influence teachers' career progression.

Head teachers frequently complained about the lack of input into the SUBEB recruitment and LGEA posting and transfer processes. In practice this means that teachers posted to schools often lack the specific subject knowledge required to fill gaps identified by head teachers, and head teachers have no opportunity to assess teachers for personality traits prior to recruitment, or to retain high-performing staff. The qualitative research encountered head teachers in all three states who were frustrated with teachers who had been appointed to their schools on the basis of personal connections rather than ability:

> *[The LGEA] 'recruit[s] teachers that are lazy, based on personal connection ... The [recruitment] process is not even there, they cannot employ even a common gate man for us. Even the teachers that teach voluntarily have stopped coming because we cannot pay them ... I find it very difficult to retain or secure talented teachers to teach in this school.' – Head teacher*

In one case, a teacher admitted that he had secured employment through a family member, despite not having an NCE. One state-level government official noted that head teachers could not credibly punish these well-connected teachers:

> *There is a political issue. You can see a teacher not attending school but if you talk to him he will directly go and tell either a councillor or somebody else with a higher rank in the political ladder. So instead of being punished, he will just lobby [the LGEA] and they will allow him to go.*

This was a frustration that was shared explicitly by at least one head teacher:

> *Some people have godfathers who stand for them, so even if you forward [a complaint to the LGEA], nothing can be done to them – Head teacher*

Head teachers have little opportunity to influence teacher remuneration through providing advice on promotions or through requesting salary deductions as a result of poor attendance.

> *I want headmasters to [be able to] deduct from the teacher's salary the number of days they are absent from school and this will make teachers be absent only when they have a tangible reason – Head teacher*

In around half of schools, the qualitative survey found that head teachers expressed frustration that the LGEA was unresponsive to feedback even when it was provided. A head teacher in a 'low-performing school' explained that 'the reason why we don't report them to the LGEA is because they don't take any action ... I personally never reported any teacher'. In such cases there is a danger that a vicious cycle emerges in which head teachers' low expectations of LGEAs make them less demanding and, in turn, this results in lower levels of LGEA support, though this dynamic was not explicitly raised by interviewees. However, there was a perception among a small number of head teachers that they were not entitled to support from the LGEA on some issues, such as staffing or resources. For example, one head teacher commented: 'I don't even follow up or call to ask if they don't do it because I don't have the right.'

This lack of formal levers with which to influence teacher behaviour was reflected in a commonly observed distinction between the language of 'reward' and the language of 'appreciation'. Head teachers and government officials often noted that in a context in which they lack options to reward

teachers, the best they can do is to provide words of encouragement and appreciation for teachers' efforts. A head teacher noted:

> *'[I only e]ncourage and appreciate the teacher and make corrections for the teacher where possible, that is the only authority I have … [It] is the LGEA that has the authority to reward and discipline teachers.'*

The sense of disempowerment was also mentioned by LGEA officials, some of whom noted that whereas they used to be responsible for taking decisions relating to recruitment, discipline and promotion, their role had shifted over time to one of merely making recommendations to the SUBEB. It was not clear whether this was the result of genuine confusion over the division of responsibilities or a tactical 'shifting the blame' for failing to support head teachers in handling teacher underperformance.

Overall, there is strong evidence that head teachers lack the formal authority to administer 'carrots' and 'sticks' that would enable them to incentivise and influence teacher behaviour in the way that TDP seeks to promote. This finding broadly corroborates those of a previous EDOREN teacher management study (Watts and Allsop, 2015).

5.3.3   Rewards and discipline: Head teachers' informal innovation

Despite these constraints, a significant minority of head teachers appear to think creatively about how they can influence behaviour indirectly within an otherwise constraining context. The most common practice was the giving of financial or in-kind rewards financed out of head teachers' own salaries. Such gifts were generally small cash rewards (NGN 100–200),[50] food, or transport costs, but in one instance included textbooks and teaching aids. Since such rewards are dependent on the financial resources available to the head teacher, not all head teachers are able to use this method to influence behaviour. As one of the head teachers lamented, 'Since I don't have anything to give, I use my mouth to thank them'.

Perhaps the greatest potential for influencing behaviour lies in head teachers' ability to harness the formal powers of LGEAs and SUBEBs. A key mechanism for doing this is the teachers' attendance register, which in most cases is checked by inspectors from the LGEA on a regular basis. A head teacher noted that 'if a teacher is absent without a reason, to discipline him we stop him from signing the time book and that really hurts them'. Although in some cases head teachers were under social pressure to manipulate entries in the attendance book (generally by marking late-attending teachers as arriving on time), they can in theory signal attendance problems to LGEA inspectors, who can then take matters into their own hands.

Head teachers can also exercise leadership by mobilising SBMC support in a dispute with LGEAs, as happened successfully in a school regarding a teacher deemed by the head teacher to be high-performing who was transferred away from the school:

> *'I was posted out from this school to [another] school in 2008, but the SBMC and other members of the community protested by meeting with the LGEA officials and begged the management to bring me back to this school and that is how I came back.'*

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[50] Enough for a soft drink or snack.

In a 'high-performing' urban school one head teacher took an interest in the regular continual assessment of pupils to identify high-performing teachers, and also threatened to strip teachers of positions of authority (perhaps as head of subject or member of school committees) that he had given them in the first place to punish poorly performing ones

These techniques highlight the importance of strong SLM skills to overcome the limitations of head teachers' formal powers. However, in most schools it appeared that head teachers were so deeply involved in the day-to-day administration that they had little time for critical reflection, creativity and academic leadership.

Table 26 Summary of strength of evidence underpinning assumptions relating to head teachers' ability

Head teachers have the **ability** to identify, incentivise and influence the positive teaching and management practices that TDP promotes	
• Head teachers are **able to identify and differentiate positive and negative teaching practices** and provide feedback to teachers to influence the positive teaching practices that TDP promotes	Mixed
• Head teachers are **formally empowered by LGEAs/SUBEBs to use 'carrots' and 'sticks' effectively** to incentivise and influence the positive teaching practices that TDP promotes	Strong
• Head teachers are able to find **informal** (i.e. non-government mandated) **ways of using 'carrots' and 'sticks' effectively** to incentivise and influence the positive teaching and management practices that TDP promotes	Mixed

5.4 Management of school infrastructure and resources

SLM include tasks relating to the school's physical as well as human resources. Section Contextual factors that influence the quality of teaching and learning discussed the importance of adequate school infrastructure and resources in providing a supportive environment for practising teaching practices that TDP promotes. Inadequate physical infrastructure in schools and lack of teaching materials can reduce teacher motivation, and therefore teacher effectiveness. This section explores the issue of inadequate school infrastructure and resources, and highlights the ways in which head teachers are supported by other actors in maintaining and repairing these.

5.4.1 Government and community roles in maintenance and repairs

Broken ceilings, furniture, and windows were all frequently observed in the qualitative study. With the exception of a few urban schools, head teachers also complained about the lack of textbooks and one 'low-performing school' had stopped being provided with chalk by the LGEA, and therefore had run out at the time of the survey team's visit.

The division of responsibilities between government and non-government organisations for maintaining school infrastructure and resources is not clear. Head teachers frequently noted that their request for additional infrastructure, repairs, and resources from the LGEA/SUBEB had gone unanswered. About 72% of schools reported receiving in-cash or in-kind support from non-

government organisations (NGOs) or programmes.[51] Of these, about 70% of sampled schools in Jigawa reported being in receipt of support from the DFID-funded ESSPIN, while a similar percentage of schools in Katsina and Zamfara reported being in receipt of support from GEP, another DFID-funded programme.

Head teachers spoke favourably of the financial and in-kind support provided by SBMCs and PTAs. In nearly all schools, local communities play a significant role in contributing modest funds to buy teaching resources[52] and mobilising expertise to fix broken school infrastructure. It was not uncommon to find that parents or other community members are required to contribute a small fee to raise funds for repairs and the purchase of new materials. It is unclear whether SBMCs are officially responsible for such a role, or whether they step in to fill the void left by the LGEA/SUBEB's failure to discharge their responsibility, and in doing so inadvertently undermine incentives for LGEA/SUBEBs to perform this role effectively. Overall, this reflects the rich confluence of community-based, national and international donors with which TDP would need to interact during its years of implementation, especially with other large education programmes running similar teacher training activities such as ESSPIN and GEP. However, the frequency of repairs reported as being needed, combined with observations made during the qualitative study and the relatively small scale of community support, suggests that in the majority of cases head teachers do not have access to adequate support to maintain and repair the school infrastructure and resources that facilitate the adoption of the positive teaching practices that TDP promotes.

5.4.2 Relatively well resourced schools

Two of the nine schools visited as part of the qualitative research stood out as having vastly better infrastructure and resources than other schools, both of which had received significant support from the SUBEB. It is likely that, as sources in the school claimed, these relative 'anomalies' arose due to their connections to influential politicians at the state and federal level who were able to direct resources in their direction. In one of these schools, the head teacher noted that whereas:

> '...nearby schools lack class rooms resources, no good infrastructure, the officials don't visit those school and the teachers there regularly, in our own case we have everything, enough class room resources, even these two additional blocks, were provided to us by [name of influential politician]. We have enough desks and enough teaching materials as well as qualified teachers, all as a result of his assistance.' – Head teacher

At a more general level, urban or semi-urban schools were generally found to be much better equipped than rural schools, with one school even having a library where textbooks were stored (though not used). However, one government official complained that

> 'When you visit some schools you find a lot of textbooks in their stores. This is why when we go for supervisions we ask them to share out the whole books, but they complain that they are afraid of sharing them out and not getting any other ones … But they were told to give out those books to the pupils! This is a challenge.'

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[51] Of the 72% schools which reported receiving non-government support, about 24% received support from private individuals or firms; 16% of schools received support from an NGO; 7% from international donors other than DFID or UNICEF; and 2% from a religious institution (e.g. church or mosque) or private individuals. Furthermore, 25% of schools reported receiving in-cash or in-kind support from 'other sources', and these were mostly specified as being from SBMCs.

[52] Purchases financed by SBMCs/PTAs mentioned in the qualitative research included writing materials, textbooks, brooms, kettles, mats, and footballs.

This pattern of unused teaching resources suggests that even in the rare cases where they are sufficient school resources are not always managed and allocated efficiently under the guidance of head teachers.[53] On the one hand, this will limit the effectiveness of TDP teacher training by reinforcing the challenges discussed by teachers in Section Contextual factors that influence the quality of teaching and learning. On the other hand, this suggests that there is significant scope in some cases for TDP's planned head teacher training to improve approaches to resource management.

Table 27 Summary of strength of evidence underpinning assumptions relating to SLM of school infrastructure and resources

Head teachers are able to exercise **effective management of school infrastructure and resources** to facilitate the adoption of the positive teaching practices that TDP promotes

● Head teachers have access to adequate support to **maintain and repair the school infrastructure and resources** that facilitate the adoption of the positive teaching practices that TDP promotes	Mixed
● Head teachers **manage and allocate school resources efficiently** to facilitate the adoption of the positive teaching practices that TDP promotes	Mixed

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[53] The World Bank found a similar dynamic in a randomised evaluation of a textbook provision programme in Sierra Leone. In many treatment schools, student access to textbooks did not increase because a large majority of the books were stored rather than distributed to students. They hypothesise that schools with a high uncertainty with respect to future transfers are more likely to store a proportion of current transfers as a form of 'smoothing consumption' (Marshak, Evans, and Sabarwal 2014).

6 TDP's delivery model for in-service training

6.1 Scope and rationale

This penultimate section summarises preliminary observations regarding TDP's implementation of in-service training activities. It is based on a 'light touch' process evaluation undertaken as part of the baseline qualitative study, which took place roughly six months after commencement of the implementation of in-service training activities. This gave the authors a nascent opportunity to study various implementation processes and practical dynamics, and in turn to provide initial impressions of how implementation of the in-service output is progressing.

TDP's in-service delivery model is multi-pronged. It involves scheduled monthly classroom-based training sessions ('cluster meetings') where pairs of teachers within a school are 'coupled' to attend the training together (peer-to-peer learning), along with other participating teachers from the LGEA. Training materials received by teachers are also numerous. Printed materials, including structured lesson plans and guides, are distributed, as well as audio-visual resources through one basic mobile phone per teacher ('a trainer in the pocket') and two amplifier-radios per school for use in classrooms. Finally, TDP teachers receive ongoing guidance through school support visits by their trainers, and head teachers in TDP schools will receive training on SLM. Teachers are trained by a selected cadre of TFs who are in turn trained by a group of 'master trainers' recruited from SUBEBs and CoEs, called the Teacher Development Team (TDT). More discussion on some of these aspects of implementation is provided in the section below, and can also be found in TDP 2014 and EDOREN 2014.

The theory underlying the in-service training component is that pupils learn more when they are taught by 'effective' teachers, and that teachers become more skilled and knowledgeable (both in terms of pedagogy and subject knowledge) through training. As discussed in the sections above, this theory rests on a number of key assumptions relating to (head) teachers' own motivation, ability, and context. Additionally, this theory also rests on a number of operational and process-based assumptions, which, based on our theoretical deduction and field observations, would need to hold in order for the various training materials and activities to result in teachers becoming more skilled and knowledgeable.

This section provides insights into some of these key operational and process-based assumptions that underpin the logic of the TDP TOC. To reiterate, this study was undertaken in the initial months of implementation, covering nine schools and, as such, does not intend to be a comprehensive analysis of whether these assumptions hold or not in each instance.[54] Instead it provides a preliminary picture of how and why the delivery model for TDP's in-service training will determine teacher effectiveness and ultimately enhanced pupil learning.

Three overarching assumptions relating to the core features of TDP's delivery model were identified for this (qualitative) process review on the basis of the qualitative evaluation matrix (Annex A, Volume II) and thematic analysis of the data. These are:

- Assumption 1: **Cluster meetings and peer-to-peer learning** – Cluster meetings are conducted regularly and effectively, and teachers are motivated to participate in them.

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[54] The scope of this analysis does not include an assessment of TDP's organisational setup at the central management (Abuja) or state levels; neither does it include assessment of the head teacher training component on SLM (which had not started at the time of our fieldwork) – nor an in-depth appraisal of the pedagogical content contained in the training material.

Teachers' learning from cluster meetings is further reinforced by peer-to-peer interactions with other trained teachers in schools.

- Assumption 2: **Materials** – Both printed and audio-visual training materials are fit-for-purpose and appropriate for the levels of skills and knowledge teachers have and the day-to-day challenges they encounter in classrooms.
- Assumption 3: **Teacher facilitators** – TFs who constitute the core frontline training workforce for the programme are appropriately selected and trained, and have the correct workload, to deliver their role effectively.

Data for the following analysis come from qualitative interviews with recipient and non-recipient teachers and head teachers, TFs, cluster meeting observations, observation of training-of-trainer sessions, and with staff at LGEAs and SUBEBs.

6.2   Cluster meetings and peer-to-peer learning

The research team's fieldwork schedule in June 2015 allowed for observation of around six cluster meetings across Jigawa and Zamfara that were taking place as part of that month's instalment of training sessions. To describe these meetings briefly: during cluster meetings, which last two days, TDP teachers from schools within an LGA generally meet in a centrally located school to receive training on the pedagogical material for that month. Each LGA has 12 TDP schools and four teachers participating from every school. Teachers are assigned to either English or maths training, and half of them (i.e. around 24) attend the first day's training on one of the two subjects (say, English), and the remaining attend the second day's training on the other subject (e.g. maths). Two TFs are assigned to each LGA and they distribute the training load amongst themselves.

6.2.1   Monetary incentives and teachers' motivation to participate in cluster meetings

A recurring theme arising in teachers' feedback on cluster meetings related to their unmet expectation of compensation, in addition to the transport costs and meals provided to them during the meeting. The absence of such compensation was a 'complaint' whose frequency far exceeded any other feedback on cluster meetings relating to training activities, materials or quality of teaching. To be specific, teachers voiced that a travel allowance of NGN 2,500 per meeting was inadequate to cover a return trip to the venue (around NGN 500–1,000) and additional costs of going to the bank to withdraw the allowance (especially for teachers who resided in rural parts of the LGEA and had to travel a long distance to find a bank or automatic teller machine). Moreover, when inadequate numbers of materials were received by TFs, teachers sometimes had to pay for photocopying them. On a related point, the mode of payment of the per diem (e-payments directly into participants' bank accounts, presumably to ensure transparency) was another source of complaint. Teachers mentioned long delays in receiving these payments (often up to eight weeks from the date of the meeting), meaning they had to bear the upfront costs of transport.

A TF succinctly explained that what, in the end, motivates teachers to attend cluster meetings is the amount they manage to save from their monthly per diems after deducting transport and other costs of participation in cluster meetings. Coupled with poverty, and low and late salary payments, this indicates a severe offsetting of teachers' intrinsic motivation to attend training: 'the money to convey them to the cluster meeting is the greatest problem, what is motivating them is the little allowance they received from TDP, but they don't get the allowance on time and coupled with the fact that they are not getting their salary on time, in terms of participation they are trying their best…'.

This points to the need to understand what motivates teachers to participate in any form of in-service training. As mentioned in Section Teacher motivation and attendance above, there are certainly teachers who take pride in their profession and seek out opportunities for learning. However, given the level of poverty of the poorly paid (if at all) teaching workforce, what appears to be the overwhelming case is that any such intrinsic motivation is eroded by extrinsic, pecuniary motivation.

6.2.2   Levels of participation and effectiveness of cluster meetings

It was reported by TFs and teachers that the cluster meetings were being conducted regularly and as per schedule. However, the general levels of teachers' participation and effectiveness of cluster meetings was observed to be weak overall. TFs spent large amounts of time writing on flipcharts or the blackboard, often with a series of spelling or grammatical errors, against a backdrop of teachers who were clearly disengaged with vast amounts of instruction, and with little discussion. A handful of teachers (often male, and head teachers) dominated cluster meetings in terms of responses to questions and eagerness to participate. While TFs often tried to encourage broader participation and attention from across the group, their efforts were not necessarily successful.

Female teachers often constituted a small minority of those attending the cluster meeting, a reflection of the low levels of female participation in teaching and the workforce in general in northern Nigeria. Females attending cluster meetings often displayed far less participation and were more often late, presumably due to family commitments and living far from the venue. Those that did attend had to take frequent breaks to attend to their young children.

An additional important driver of weak overall participation may have been the significant use of English in cluster meetings, given the low levels of competency in the language among teachers, as evidenced in the quantitative baseline survey. Teachers were often lectured on pedagogical techniques in English using relatively difficult terms they were unfamiliar with (e.g. 'segmenting' and 'blending' in phonics instruction). Thus, similar to the case in primary school classrooms, cluster meetings also encountered complex language challenges in teaching and learning: while teachers' own knowledge of English was generally weak, many of the discussions (and reading and writing) in cluster meetings still took place in English, without adequate adjustment and repetition by TFs in Hausa – the language a vast majority of teachers are familiar with.

6.2.3   Peer-to-peer learning

A key pillar of TDP's in-service training model is peer-to-peer learning. This mode of learning expects that pairs of teachers from a school undertaking training together will provide an ongoing support network for teachers within their own school to discuss the material taught and challenges faced in the classroom. According to the model, this would also then gradually lead to a broader discussion of materials within the school among TDP and non-TDP teachers, leading to a whole school improvement model.

In cluster meetings, TFs try to facilitate peer-to-peer learning by seating teachers from the same school near each other, to encourage discussion among them. This is of course not easy, particularly if there is not a pre-existing culture of collaboration to attain common professional goals, and is further compounded by the presence of age or gender or other cultural, social and/or economic barriers among teachers. There appeared to be nascent signs of peer-to-peer learning based on teachers' anecdotes of observing their peers' lessons and discussing common challenges; however,

these were not observed by the research team directly in any of the schools. Absenteeism of teachers from school, especially on long periods for study, could potentially put at risk any incipient signs of peer-to-peer learning because of the limited time spent in face-to-face contact with one's peer.

As for sharing of knowledge and materials by TDP teachers with other teachers in the school, the evidence seems to suggest that presently no such exchange appears to be taking place, or is very limited and is happening in rare cases only. TDP teachers often claimed to be sharing materials among colleagues, while non-TDP teachers claimed that this was not true and insisted on the need for direct TDP training for themselves. On a related point, in one school complaints of favouritism by the head teacher and local authorities towards TDP teachers in regard to selecting them for participation in the programme, and instances of hostility between TDP and non-TDP teachers, were reported. In this particular instance, the non-TDP teachers were aggrieved about not being selected to participate, even though they fulfilled the required selection criteria. Such aggravation is more likely in large schools with many teachers, less so in small schools.

Table 28 Summary of strength of evidence underpinning assumptions relating to cluster meetings and peer-to-peer learning

Cluster meetings and peer-to-peer learning – Cluster meetings are conducted regularly and effectively, and teachers are motivated to participate in them. Teachers' learning from cluster meetings is further reinforced by peer-to-peer interactions with other trained teachers in schools.

• Teachers' are **motivation to participate** in cluster meetings (and their motivation is not offset by countervailing incentives)	No	Strong
• General levels of teachers' **participation and effectiveness** of training activities in cluster meetings is high	No	Strong
• Teachers' learning from cluster meetings is further reinforced by **peer-to-peer interactions** with other trained teachers in schools	No	Strong

6.3   Content and usage of materials

TDP teachers receive a bundle of materials, both printed and audio-visual, as part of their training: this includes lesson plans and teachers' guides (printed) and the phone-based 'trainer in your pocket', which contains uploaded training materials and other audio-visual materials for use in the classroom.

6.3.1   Relevance of training materials

As mentioned in Section Contextual factors that influence the quality of teaching and learning above, teachers face severe day-to-day constraints in the form of insufficient infrastructure and materials in classrooms, coupled with their own weak subject knowledge and pedagogical skills. Any programme aiming to enhance teachers' knowledge and skills in this difficult context would thus need to help teachers deliver instructional content to pupils in large, (often) multi-grade classrooms to the best of their abilities, given teachers' own weaknesses in knowledge and skills.

Do TDP materials address these challenges sufficiently? First, training material and cluster meetings do talk at length about some of these challenges, mainly classroom management techniques in large

classes. However, field observations offered limited evidence, if any at all, of any perceptible shift in teachers' behaviour and skills in the classroom amidst these challenges. It is likely to be too early in the programme's life to expect changes in deeply entrenched classroom practices, and indeed field observations suggest this is the case. However, what was clearly observed in classrooms was a certain superficial adoption of some of the techniques taught to teachers in regard to child-centred learning. For instance, teachers displayed a tendency to organise pupils into groups irrespective of whether the content being taught required group work or not, leading to a certain 'isomorphic mimicry'[55] of practices that are deemed to be associated with superior performance, irrespective of context or need. However, it was not possible to conduct a detailed pedagogical appraisal of the training materials under this study due to time constraints and the lack of a pedagogy expert in the team.

A number of more specific issues were raised by teachers and TFs as part of their feedback on training materials. The lesson plans, it was mentioned, were designed for one-hour lessons, while the standard lesson length in practice was typically 35 minutes – thus leaving teachers to either cram an hour's worth of material into approximately half the time or work out for themselves how to modify the lesson plans to the shorter lesson lengths. The lesson plans, also used by ESSPIN in Kano and Jigawa (called 'Kan-Jiga' lesson plans), were fairly detailed and structured to the extent that page numbers of specific textbooks of specific publishers were used to guide a teacher's lesson through a class, even when the particular publisher's textbooks were not readily available in some of the TDP states (Katsina and Zamfara), thus leaving teachers unable to fully follow lesson plans with the corresponding content in textbooks. It was not possible to definitively say whether and to what extent teachers were able to adapt these (longer) lesson plans to their class lengths.

Usually cluster meetings began with a brief session on listing such challenges and feedback, and there did appear to be mechanisms for TFs to route these messages up to programme staff in the state capitals and Abuja: for instance, senior programme managers in Abuja were certainly aware of the lesson length issue pertaining to lesson plans. What is less apparent is whether there are mechanisms for such feedback to translate into action and rectification.

6.3.2   Usage of materials

As mentioned above, aside from printed materials, each teacher also receives audio-visual material uploaded onto a simple mobile phone for use in their own time ('trainer in the pocket'); and each school receives two mobile amplifiers to play a variety of such audio material in the classroom.

How often are these novel materials being used? In most schools visited for the qualitative study, teachers had now made the 'trainer in your pocket' their personal phone for making calls and sending text messages – this is not necessarily undesirable since using the phone for other purposes might also prompt them to use the phone-based training materials more frequently. By and large, it appeared that usage of these materials varied substantially from case to case, largely dependent on teachers' own initiative and interest. There was a teacher in Jigawa who, by his own initiative, now recorded new songs and poems onto the phone and played them back to his class. On the other end of the spectrum, there was also a teacher who thought 'trainer in your pocket' essentially

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[55] 'Isomorphism' and 'isomorphic mimicry' are terms from evolutionary biology, popular since the 19th century, which refer to different organisms evolving to look similar without actually being related. In particular, isomorphic mimicry is the process by which one organism mimics another to gain an evolutionary advantage. Lately the term has caught on in the area of education, courtesy of Lant Pritchett, and is used to refer to fundamentally dysfunctional education systems that look like well-performing systems. Such dysfunctional systems pretend to conduct teaching and learning like the kind that goes on in functional education systems, but without their core underlying functionalities.

referred to the per diem he could pocket every time he attended a cluster meeting. On the whole it was not rare for head teachers to send a pupil or a teacher to his home to fetch a mobile amplifier because visitors, i.e. the research team, had arrived in the school to talk to them about TDP. Similarly, it was not uncommon to see entirely unused lesson plans and teacher guides stored in the school library. In sum, while there are individual cases of teachers who may have taken to the new materials and technology more effortlessly, there is limited evidence of perceptible shifts towards their usage and it is hoped that as the programme matures teachers' use of materials will increase over time.

6.3.3   Too many teacher training programmes?

Training of primary school teachers in northern Nigeria is a crowded space, i.e. in many cases, schools and teachers are in receipt of multiple state- or donor-funded in-service teacher training programmes. For instance, all of TDP's schools in Jigawa are also in receipt of another DFID-funded programme, ESSPIN, which also trains teachers in English and maths, and in fact both programmes use similar materials. Multiple training means each programme comes with their own set of jargon related to pedagogical practices and techniques. This often leads to situations whereby some of the same pedagogical concepts are referred to by different terms, leading to confusion among the recipient teachers and even trainers.

For instance, teachers suspected what was being taught to them as using 'no-cost/low-cost materials' in the classroom was essentially the same as the concept of 'improvisation' taught to them in pre-service training (for those who has an NCE). Similarly, some teachers in Zamfara were in receipt of Jolly Phonics as well as TDP training, both of which train on how to teach children to phonetically break down words in order to facilitate reading skills. However, cluster meetings in the Zamfara clearly demonstrated teachers' (and trainers') confusion about how to teach using phonic deconstruction, often mixing up names of letters with their sounds within the same word. While it is not being suggested here that a single programme such as TDP should take up the mantle of harmonising these overlapping techniques across programmes, the resulting confusion is certainly something to consider when designing pedagogical training material for a programme.

Table 29 Summary of strength of evidence underpinning assumptions relating to content and usage of training materials

Materials – Both printed and audio-visual training materials are fit-for-purpose and appropriate for the levels of skills and knowledge teachers have and the day-to-day challenges they encounter in classrooms.

• Training materials are relevant to the subject knowledge, pedagogical and language skills of teachers and their day-to-day classroom challenges	No	Strong
• There are mechanisms to feed back challenges faced by teachers in using these materials (to TDP for action and rectification)	Mixed	
• Training materials are actually used by TDP teachers regularly for self-learning and discussions with other teachers	Mixed	

6.4 TFs are appropriately selected and trained, and have a manageable workload

As described above, TFs are a vital cadre of frontline training personnel who interact with the TDP beneficiary teachers monthly through cluster meetings and school support visits. They receive two days' training each month (one each for English and maths) from the TDTs ('master trainers') and subsequently train the teachers for a day each on the two subjects. This last sub-section looks at how TFs were selected, their backgrounds, the training received by them, and their workload – and what this implies for their effectiveness as teacher trainers.

6.4.1 Background and skills

It appeared from interviews with the TFs that a vast majority of them had previous backgrounds as classroom teachers and/or head teachers, with requisite NCE (or higher qualifications); thus theoretically placing them in a good position to understand the constraints teachers face daily in their jobs, especially in the classroom, and to try to address these through training. In practice, while TFs appeared to be well aware of extraneous constraints faced by teachers ('disengaged parents', 'untalented pupils', 'low salary'), most of them seemed fairly unaware (or at least unwilling to discuss) teachers' own weaknesses in terms of knowledge and skills. Poor teaching quality and low teacher effectiveness, in the words of one TF, came down to teachers essentially being 'lazy' and 'incompetent'. Thus, ultimately it remains unclear how much of their own background and experience TFs are able to harness for effective training of teachers.

A further question on TFs relates to the adequacy of the training received by them, and whether this prepares them well to undertake the difficult task of teacher training. A TF described the training she received as follows:

> *At first we were taken to Abuja for 10 days' training on special skills and techniques of teaching. They started with mathematics, English and said they are going to include sciences. And when they started, they said they are going to trained us on how to teach primary 1, 2 and 3, then 4, 5 and 6, then JSS1–JSS3. We were trained on how to teach mathematics and English in primary 123. After the 10 days we return and we were still trained in the LGEA headquarters and we stepped down the training to other teachers. (TF)*

This initial training was followed by a two-day monthly training session with the TDTs on that month's materials, just before the TFs themselves trained the teachers. Is this training optimal? TFs themselves largely felt the quantity of training was adequate, but the quality of teaching in cluster meetings varied substantially from one TF to another, as evidenced by cluster meeting observations. As mentioned above, as in school classrooms, TFs displayed limited usage of 'child-centred learning', spending large amounts of time writing on flipcharts or the blackboard, often with a series of spelling or grammatical errors, against a backdrop of teachers being clearly disengaged and with large amounts of instruction but little discussion. TDTs, who are often available and at hand to correct TFs, often have to intervene to correct them or manage the meeting. Having said this, it is not a foregone conclusion that more training for TFs would necessarily lead to better teaching – constraints imposed by absorptive capacity might soon kick in, combined with the fact that TFs usually also have to deliver their regular jobs in the LGEAs during the remaining days of the month. This is discussed further in the sub-section below.

6.4.2   TFs' workload and training responsibilities

On paper, a TF's role includes three key tasks: a) attending monthly training with TDTs before cluster meetings (two days); b) conducting monthly cluster meetings and reporting on programmes to TDTs (two days); and c) conducting monthly school support visits (three days). In practice, however, the gamut of activities TFs perform goes above and beyond these three activities. It thus requires a fair amount of displacement of time from their regular jobs in the LGEA (say, as school inspectors or support officers) or, in some cases, as regular classroom teachers. TFs directly or indirectly, in many cases, spoke of the immense workload on them in organising cluster meetings, including logistics and administrative activities. In conversations with TFs, it was calculated that on average a TF spent about seven days for cluster meetings and inspections per month (two days for TDT training, two days for cluster meetings, and approximately three days for school support visits) but this does not take into account any peripheral preparatory reading they had to undertake for cluster meetings. Most importantly, these seven days do not take into account large amounts of administrative tasks TFs have to undertake before cluster meetings – not to forget their regular jobs as LGEA staff. TFs routinely complained of not receiving adequate copies of teacher guides, lesson plans and other handouts, which meant they would have to make photocopies themselves (often using their own money). TFs similarly voiced frustration regarding having to spend their own money supplementing stationary, flipcharts, etc. received from TDP in order to carry out the vast number of activities expected to be completed during a single cluster meeting.

Table 30 Summary of strength of evidence underpinning assumptions relating to appropriate selection, training and motivation of TFs

TFs who constitute the core frontline training workforce for the programme are appropriately **selected, trained, and motivated** to deliver their role effectively

• TFs are appropriately selected: i.e. they have a suitable background and experience to understand the constraints faced by teachers, and address them effectively	Mixed	
• TFs are appropriately trained	Mixed	
• TFs are appropriately motivated, and in particular their workload and supplies from the programme allow them to deliver their role effectively	No	Strong

7   Conclusion and discussion

One of the primary objectives of this mixed-methods report is to provide baseline results for potential adjustments to TDP's design and implementation, as deemed appropriate by the programme and DFID Nigeria. The section below draws the report to a conclusion by first summarising key results and then highlighting their implications for the programme. Planned follow-up evaluation activities are also discussed.

7.1   Pupil learning levels and overall experience of schooling

Pupil learning levels in English, maths and science are very low in the treatment and control areas. Only very small groups of Grade 3 pupils demonstrate the basic English literacy skills (3%), basic numeracy skills (6%), and scientific literacy (15%), expected at the end of Grade 2. Of even more concern are the substantial proportions of pupils who are below the expected grade level by about two full grades. In all three subjects, girls and pupils from the poorest household wealth quintile perform significantly worse than boys and pupils from the richest household wealth quintile, respectively.

Qualitative accounts from pupils depict a vicious cycle linking household poverty to exclusion from learning in school and broader social exclusion. This is corroborated by quantitative results which show that differences in pupils' own family backgrounds and community-level characteristics explain the majority of variation in pupil learning. Teachers often allege that pupils do not attend school regularly because of (paid or unpaid) work, or because their parents simultaneously enrol them in Islamic education lessons outside the school. Although primary schooling is free in Nigeria, schools sometimes charge fees for exams or PTA charges, or charges towards the cost of uniforms. There are, therefore, indirect schooling costs even when the direct costs of schooling are presumably minimal or even free – putting pupils from the poorest household at a disadvantage. Most pupils' accounts reveal an acceptance of the fact that teachers often do not come to class on time, or at all. Pupils in schools with poor infrastructure are conscious of the problems this causes for their teachers in delivering their roles – infrastructure features prominently among problems pupils would sort out if they were granted magical powers.

This picture of low learning levels and pupils' experience of schooling at baseline confirms that the core objective of the programme of improving pupils' learning levels is highly relevant in the programme LGAs. Pupils' own family backgrounds and community-level characteristics may be beyond the scope of a teacher development intervention, yet these are likely to impinge on the effectiveness of TDP – this is indeed a sobering finding for a programme that is driven by school-based interventions alone. These factors need to be taken into account in the programme design and in assessing the probability of the programme's success. It is important to ensure that pupils from poorer backgrounds, as well as girls, are considered as a target group in the core objective, and that the teacher training materials and activities consider how schools can address their particular learning needs in ways that are more inclusive.

7.1 Teacher effectiveness

7.1.1 Teachers' subject knowledge and ability to monitor pupils' progress

For pupils to be able to learn while in the classroom teachers must have sufficient knowledge of the subject they are teaching. **The vast majority of teachers in the impact evaluation areas have grossly inadequate subject knowledge in English, maths and science to be considered effective in the classroom.** Just 0.1% of teachers have sufficient subject knowledge in science and 0.4% in English, and the group with sufficient subject knowledge in maths, although larger, is still very small, at 8%. The most critical group, which has only limited subject knowledge and which, without extensive and continuous training and support, cannot be considered effective in the classroom, comprises 63% of teachers for science, 53% for English, and 17% for maths. **Teachers, head teachers, and LGEA officials also demonstrate fairly limited acceptance that lack of subject knowledge is an issue** – few respondents show understanding of the challenges encountered by teachers regarding their subject knowledge and possible ways to address this.

The average teacher is also unable to correct errors in pupils' work and to provide relevant feedback, or to identify the learning needs of individual pupils and monitor their academic progress over time. Teachers claim to know whether pupils are learning or not from class tests or class work. However, it does not seem that regular assessment of pupils is common practice – only one of the nine case study schools conducts continuous formative assessment. Teachers do spend a large amount of time correcting pupils' notebooks but usually spend very little time checking each notebook before ticking it and handing it back. Even when teachers have marked the work as correct, it appears that pupils do not know how to write letters or the meaning of what they have written. This suggests that teachers are either unable to pay proper attention to the pupils' work, for example because of large class sizes, or lack the knowledge to mark the work appropriately, or both.

7.1.2 Teachers' pedagogical skills

The average teacher involves pupils for about a quarter of the total lesson time in pupil-centred teaching practices that characterise effective teachers and classroom practice. Simply writing or reading from the blackboard, considered to be a neutral teaching practice, takes up 40% of total lesson time.

Teachers rely heavily on textbooks and curriculum guides, especially in the absence of foundational subject knowledge, rather than being able to devise their own lesson plans to reach a specified learning goal. They demonstrate limited ability to adapt the textbook material to the conditions and constraints they face in the classroom. In particular, teachers demonstrate limited ideas about how pupils learn and about how teachers can respond to different learning levels within the same classroom to ensure all pupils achieve at least a minimum level. **In general, teachers' prior pedagogical training does not seem to have adequately equipped them for the realities they face in the classroom,** including large class sizes, multi-grade teaching, limited resources, and limited ability of parents to support their children.

There is substantial loss of instructional time due to shorter lesson length, which necessarily limits the potential for in-class learning to take place. Classroom observations found that 45% of lessons were more than five minutes shorter than a standard 35-minute lesson.

7.1.3   Teachers' motivation and attendance

This baseline report finds mixed evidence of teachers being intrinsically motivated to improve their teaching, to take part in learning opportunities and to apply new knowledge when they get it. Teachers gave varied descriptions of their attitudes towards the teaching profession, ranging from those who described teaching as an inherently noble profession advancing society, to those who accepted teaching jobs because they were unable to find anything else.

There is strong evidence that teachers feel demotivated due to a range of extrinsic factors. Among these factors, teachers predominantly talked about low and late salary payments, the lack of learning resources for pupils and poor infrastructure, over-crowded classrooms, irregular attendance of children, 'untalented' pupils, lack of promotion or perceived unfairness in promotions, and arbitrary transfers.

The average daily teacher absenteeism over a five-day period, according to the schools' records, is 14%. The most common reasons cited by teachers for their absence are: own or family illness (58%); collecting salary and family reasons (20%); and social/religious obligations (10%). However, qualitative researchers found that **teachers combine their teaching work with farming or small businesses outside the school.** Some teachers are undergoing further training or education at the same time as teaching, taking them away from their regular jobs. In most schools, researchers also saw teachers arriving late.

Classroom absenteeism is a common observation in the qualitative survey. Teachers' specialised training in their NCE often does not match the subject that is needed in a school when they are posted there, and shortages of teachers can arise in specific subject areas even when there is no overall shortage of teachers.

7.1.4   Contextual factors that affect the quality of teaching

About 88% of head teachers reported that their schools were in need of major repairs. Only about 11% of schools had an electricity supply. In teacher interviews, 70% of teachers noted that their school's building was in a 'poor condition', and 33% said they have inadequate materials to do their job properly. Inadequate classroom resources and poor school infrastructure were ranked among the worst constraints faced by teachers. **Urban or semi-urban schools were generally found to be much better equipped than rural schools in terms of physical infrastructure.**

Head teachers frequently noted that their request for additional infrastructure, repairs, and resources from the LGEA/SUBEB go unanswered. Political connections were highlighted as an important determinant of how well equipped schools were.

Textbooks are also not routinely distributed among pupils. This is sometimes because there are insufficient textbooks. **In the rare cases where school resources are sufficient, there is evidence that these are not always managed and allocated efficiently** (for example, unused teaching resources and textbooks in a head teacher's office kept under lock and key).

7.1.5   Implications of teacher effectiveness baseline results for TDP

This baseline survey investigated whether teachers are motivated to attend school and lessons regularly; whether they have sufficient subject knowledge and pedagogical skills; and whether they have access to sufficient infrastructure and materials.

For a vast proportion of schools studied as part of this baseline survey, none of the assumptions hold up fully with strong evidence. This is not to say that they do not hold up at all but that, at least in some cases, the evidence indicates that they are binding. For example, it may be that only a minority of teachers frequently miss school, but absenteeism rates are high enough to lead to doubts about the impact of any teacher development activity on pupils' learning outcomes. Similarly, not all schools have very large classes, but a substantial proportion do.

Certain dysfunctionalities are pervasive across schools, irrespective of whether their teachers have high, typical or low levels of subject knowledge. Infrastructure and resources are typically better in the high-performing schools. However, many of the same dysfunctionalities are observed in both high- and low-performing schools. For example, almost across the board, and in both rural and urban schools, pupils' absenteeism from school and teachers' absenteeism from school and classroom was observed. This suggests that the challenges identified in the qualitative study are not limited to the worst-performing schools but are more pervasive.

Some of the issues raised here are likely to remain beyond the scope of a programme such as TDP. Infrastructure problems and large class sizes require action at the federal, state, and local government level, possibly combined with actions to build the capacity of SBMCs and parents to hold schools to account. It is also doubtful whether TDP can produce a radical change in teacher subject knowledge, as this knowledge is the result of teachers' entire education, and cannot be reversed with a relatively short training intervention. Yet without addressing these broader systemic issues, there is unlikely to be a measurable improvement in pupils' learning outcomes.

Action for TDP could, however, focus on how the teacher training materials and activities it undertakes can take into account the reality of the difficult contexts in which teachers work, and pitch their content to the very limited pedagogical skills and subject knowledge that most teachers currently possess.

It is worth investigating whether there is space to politically push for the government's language policy – of teaching in Hausa in Grades –-3 and in English thereafter – to be actually enforced, which would mean producing and using Hausa textbooks and assessments for early grade learning. This would still be a radical change as teachers may not be familiar with textbooks written in Hausa, but it would at least mean engaging with the reality of teachers' current understanding of English and with the fact that 99% pupils in this survey reported Hausa as their main home language. The switch to English in Grade 4 would remain difficult, but arguably no more so than currently.

7.1   SLM

Effective SLM is crucial for the success of TDP's in-service training activities for two reasons. One of the key outputs of the TDP's in-service teacher training activities is enhanced SLM. In addition, teachers cannot be assumed to be motivated to adopt new teaching practices without appropriate leadership and management from head teachers.

The baseline survey reveals strong evidence that, in most cases, challenges faced by head teachers significantly weakens the assumptions upon which TDP's TOC rests.

Head teachers are not extrinsically incentivised and in many cases not intrinsically motivated to improve SLM or encourage teachers' adoption of the teaching practices that TDP seeks to promote. There is a risk that head teachers will not exercise their ability to influence such change where they encounter resistance to new practices and where they risk disrupting otherwise positive

relationships within the school. This would mean that newly acquired subject and pedagogical knowledge is not, or is only superficially, applied by teachers in a classroom context.

Head teachers are generally unable to effectively address the widespread problem of teachers' absenteeism from school and classroom. This suggests that, even if teachers attend TDP training and improve their subject and pedagogical knowledge, there is a significant risk that teachers will not apply this knowledge in the classroom context because they spend large parts of the school day outside of classes.

Head teachers remain at least partly able to influence teaching techniques and correct subject knowledge mistakes through lesson observations and feedback. This suggests that head teachers will be able to motivate and persuade teachers that already attend lessons and have improved subject and pedagogical knowledge to adopt the positive teaching practices that TDP seeks to promote.

Many of the factors that shape this context – such as salary payment systems, and the responsiveness of LGEAs/SUBEBs to head teachers' requests – are beyond the scope of TDP. **However, there are potential lessons that can be learned from the baseline research to inform future TDP activities:**

- Low teacher attendance is a widespread problem but head teachers alone in most cases do not have the means to solve it. TDP could perhaps request that good classroom attendance be an additional criterion for selecting future beneficiaries of TDP training, thereby maximising the chances that new knowledge is applied in a classroom context.

- Head teachers are rarely held to account and therefore they are not incentivised to improve performance. This fact makes TDP more reliant on head teachers' own motivation, which is also lacking in many cases. TDP could consider including activities designed specifically to motivate head teachers.

- Head teachers are sometimes unclear of their rights and responsibilities in relation to other actors in the education system, particularly LGEAs/SUBEBs. TDP's planned head teacher training activities could increase their awareness of these, and equip them with the skills necessary to navigate such a constraining system.

- A large number of TFs are LGEA staff. Given that many of the constraints on effective SLM are caused by dynamics at the system level, TDP may wish to consider how these TFs could foster an honest dialogue between influential community members, SUBEBs, LGEAs and schools to create a common understanding of the drivers of school performance.

7.1   TDP's implementation model for in-service training

Quality of implementation and robust delivery of outputs are vital to TDP's success. The final area of TDP's TOC is the programme's implementation model for delivering in-service training. In particular, this report discussed cluster meetings and peer-to-peer learning, training materials and TFs, with the aim of ascertaining whether assumptions related to TDP's operational effectiveness – which underpin the logic of the TDP TOC – hold in practice.

A number of challenges relating to the programme's implementation weaken its TOC and reduce its chances of meeting outcome- and impact-level goals. Weak participation in cluster meetings,

due to factors like language complexities and barriers such as gender, is persistent. There is also limited evidence of peer-to-peer learning materialising in practice due to low teacher motivation and high absenteeism, leading to limited time devoted to peer interaction. TDP's training materials try to address the constraints faced by classroom teachers (e.g. large class sizes) and propose techniques for effective teaching in the midst of these obstacles, however observations in these early stages of implementation reveal limited application of these techniques in classrooms, or superficial adoption at best. Confusion among teachers and trainers between concepts and terminology used by various teacher training programmes is common. While mechanisms exist for routing feedback on the training from teachers to material developers and programme managers, it is not clear whether this feedback then prompts action and rectification. Finally, TFs have fairly strong backgrounds in classroom teaching and school administration but encounter some of the same pedagogical limitations in their skills as are faced by teachers themselves, and they also face an immense workload in organising and delivering cluster meetings (alongside discharging their day jobs, mostly in the LGEAs).

It is worth emphasising that teachers in northern Nigeria have incredibly tough professional duties to discharge – they are expected to teach children where classrooms sometimes do not exist, textbooks are often scarce, and class sizes are large. Teachers' intrinsic motivation to be better educators is often eroded by broad-based poverty and low salaries, and long delays in receiving them. This leads to per diems from cluster meetings then becoming a key incentive for participation in training. **A number of these challenges appear to be well beyond the programme's direct ambit of control.** For example, issues of low salaries and late payment relate to federal- and state-level governance and public financial management issues and it is not straightforward for TDP to influence these issues, despite these challenges having an immense impact on programme success.

It should also be borne in mind that this process assessment was undertaken in the early stages of implementation and it is expected that some of the operational teething issues will be alleviated as the programme matures. However, there are some challenges which appear more within the programme's ability to address in the short or medium term.

- To begin with, teachers and their trainers would find it immensely helpful to **receive materials in adequate quantities and on time**, to avoid them having to pay out-of-pocket to make photocopies, buy stationery, and so on.

- The delivery model will be enhanced considerably if **feedback mechanisms** from teachers regarding the training are more effectively routed to those who can address this feedback, and if feedback is followed up on with actions and decisions.

- The programme might further want to consider what value the idea of training some teachers in a school while leaving out others is adding, given the discussion on limited peer exchanges among selected teachers and the possibility of **hostility between TDP and non-TDP teachers** within a school.

- Finally, the **lack of a direct emphasis on subject knowledge in the TDP's training curriculum is a concern,** and something for TDP and DFID to address. Ineffectiveness of training is often driven by limitations imposed by teachers' own absorptive capacity for new materials and pedagogical techniques. In a context where teachers' own subject knowledge is grossly insufficient, more training on newer pedagogical techniques will only build on a weak foundation of subject knowledge and will limit the absorption and adoption of new pedagogical content, thus weakening chances for programme success.

7.1   Follow-up quantitative and qualitative surveys

The findings of this baseline survey call for urgent attention to the fact that pupils in treatment and control schools are on a flat learning trajectory and the effectiveness of teaching in these schools is of serious concern, and that most – if not all – assumptions underlying the logic of TDP's TOC do not hold in practice. These results naturally have serious consequences for TDP's ability to achieve its desired impact of improved pupil learning.

The evaluation framework had originally proposed follow-up quantitative and qualitative midline and endline surveys in 2016 and 2018 respectively. The timing of the midline was planned to coincide with the expansion of TDP's in-service training activities to Kaduna, Niger state and Kano, and thus to inform the design of the scale-up to these states based on lessons learned from Phase 1 states. However, with the release of the baseline survey results showing worryingly low levels of pupil learning and teacher effectiveness, discussions were held in October 2015 between DFID, TDP, EDOREN and the programme's annual reviewers regarding whether the midline would have allowed adequate time to detect any perceptible changes to key indicators of interest. It was felt that the quantitative midline survey would not add much value in terms of informing the programme's future implementation, and especially its scale-up, and instead a series of implementation-focused studies covering operational and process questions might be more valuable.

After discussions and consultation, the TDP evaluation's steering committee agreed on the following three questions for a 'midline' process evaluation:

- Given the low levels of subject knowledge and pedagogical skills among teachers, as established by the baseline survey, how could TDP make the TDTs, teacher trainers, cluster meetings and school support visits more effective?

- To what extent do TDP trained teachers understand the content of the print and audio-visual training materials they have been given? To what extent do they use these materials both inside and outside the classroom? How can the programme make the materials more useful and more used – in terms of content, language and usage?

- How could TDP improve school leadership (especially vis-à-vis management and governance) in TDP schools – in terms of more effective head teachers, education secretaries, inspectors, quality assurance officers, SBMCs and parents?

These studies would be conducted by EDOREN and would be due in time for the planned scale-up in late 2016. The endline mixed-methods surveys will be conducted as planned in June 2018, to allow for measurement of any programme impact on teacher effectiveness and pupil learning levels. The baseline panel of pupils who were at the beginning of Grade 3 at October 2014 will be on the verge of taking their primary school leaving exams at the end of Grade 6 in June 2018.

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