

Teacher Development Programme

Endline Evaluation (Volume I)

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Executive summary

The Teacher Development Programme (TDP) is a six-year (2013–19) programme funded by the UK Department for International Development (DFID), with a total budget of £34 million, seeking to improve the quality of teaching in primary schools and junior secondary schools and in colleges of education at the state level in northern Nigeria. It works on in-service training for primary teachers, reform of pre-service teacher education, and strengthening evidence-based research on teaching. The programme initially operated in Jigawa, Katsina, and Zamfara states, and was later extended to Kaduna and Kano.

This evaluation focuses on TDP's in-service training and support for primary teachers in the three core curriculum subjects of English, mathematics, and science. It uses a **mixed-methods approach** (Chapter 2, p. 4) with quantitative and qualitative research. The quantitative part draws on a panel survey of 330 schools in Jigawa, Katsina, and Zamfara, in 2014 and 2017. Groups of schools that were randomly assigned to a treatment group, in which teachers received TDP support, training and materials, or to a control group, in which they did not. Comparison between randomly assigned treatment and control groups, together with an instrumental variables approach to deal with sample contamination and non-compliance, and statistical models which control for potential biases due to teacher or pupil attrition, are used to estimate the causal effects of TDP. The evaluation estimates the effect of TDP on teacher attendance, teachers' practices in the classroom, and pupil learning outcomes, and also provides descriptive statistics, including on training, school leadership and management, pupil attendance, teacher subject knowledge in English, mathematics and science, and pupils' learning outcomes in the same three subjects. A series of qualitative studies were conducted during the same period. These are used to examine the factors that hindered or facilitated TDP, and stakeholders' perceptions of the effects and sustainability of the programme.

The evaluation's review of **TDP implementation** (Chapter 3, p. 13) shows that the programme was largely implemented as intended in the intended treatment schools, and not implemented in control schools, with a few exceptions. TDP initially focused on four teachers in each school where it operated, but later decided to scale up to include all the teachers in each school. At the time of the endline evaluation, 40% of the teachers in these schools had reportedly received the training. A reading programme, introduced in 2017, had reached 47% of teachers in the treatment schools. High levels of teacher and head teacher turnover have made it more difficult to ensure that a high proportion of teachers was trained in each school. Teachers and head teachers appreciated TDP greatly and reported finding the training and in-school support helpful, but there were concerns about the use of the materials and technology that were distributed.

The TDP intervention took place in an extremely difficult **context** (Chapter 4, p. 26) for school improvement. Jigawa, Katsina, and Zamfara are among the most educationally disadvantaged states in Nigeria, with low school attendance rates and adult literacy, particularly among girls and women, and in rural areas. The states have struggled to disburse sufficient finance to primary schools for infrastructure maintenance, teacher recruitment, and teacher salaries, and there are large numbers of enrolled pupils for each teacher and classroom. Communities have been sceptical of the value of Western education, and some children are required to provide economic support to their families. Pupils are often absent during harvesting and some come to school hungry.

Head teachers felt that TDP had a positive impact on their **school leadership and management** (Chapter 5, p. 44), including by increasing their knowledge on managing their relationships with teachers, and providing constructive feedback and support. Nearly all head teachers said they conducted lesson observations, although some did not conduct them very frequently. There were declines in frequency of lesson observation and formal meetings with teachers, which may reflect head teachers spending more time on record-keeping or trying to deal with increased enrolments and insufficient teachers.

Teachers' subject knowledge (Chapter 6, p. 53) in English, mathematics, and science was found to be low in the 2014 baseline study and has not improved since. Nor is it any better among teachers trained by TDP compared to those in control schools. Very few teachers have sufficient levels of subject knowledge for teaching at primary level, and they struggle particularly with reading and writing in English.

TDP has had a positive impact on **teachers' practices in the classroom** (Chapter 6, p. 56). The use of effective teaching practices has increased significantly since baseline, and more so in treatment than in control schools. Teachers spend less time chanting, or writing on or reading from the blackboard, and more time assisting pupils working or discussing in groups, and they make more use of improvised materials. The impact of TDP is estimated to be around four percentage points in terms of the proportion of time teachers spend in positive interaction during a lesson.

Teachers are more often **absent from school** (Chapter 6, p. 64) than at baseline, and teachers in TDP schools were absent no less than those in control schools. Even when in school, teachers often appeared to be absent from the classroom. In around half of classes observed, there were pupils waiting to be taught but no teacher 15 minutes after the morning break. Teachers' commitment to their profession appears to have improved since the baseline, but teacher motivation continues to be affected by factors including irregular salary payments, pupil non-attendance and a lack of visible progress in learning, overcrowded classrooms, and the low level of respect they receive from some communities.

Pupils' learning levels (Chapter 7, p. 73) in English, mathematics, and science were assessed at baseline when they were in Primary 3, and again at endline, when most were in Primary 6. By endline, most were able to answer questions targeted at Primary 1 or 2 but were not able to take on more complicated tasks, such as reading a paragraph with understanding, performing two or three-digit additions or subtractions, or using an abstract scientific concept to explain a process. Around half could not read a single short word in English. There was no significant difference in the progress made by pupils in schools that had received TDP intervention and those that had not. As at baseline, there continue to be substantial inequalities in pupils' learning outcomes, with boys and children from the wealthiest families learning more than girls and those from poorer families.

The evaluation considers key stakeholders' perceptions on whether TDP is likely to be **sustainable** (Chapter 8, p. 85). Teachers enjoyed and valued the TDP training and support and said that they would continue to use the skills they had learned. However, materials such as posters and amplifiers were not used frequently. Teachers were sceptical of whether the TDP intervention would be sustained by State Universal Basic Education Boards (SUBEBs). SUBEB staff themselves viewed the programme positively, feeling that it had changed teaching practices, but gave mixed responses on whether it would be sustained after the DFID-funded support ended.

In summary, TDP is well-appreciated, valued, and seen as effective by a wide range of stakeholders, and has had a positive impact on the way teachers teach. It has been implemented largely to plan despite very difficult circumstances and has been adapted in response to issues identified in earlier research. However, it has not been able to overcome the key issues of teachers' limited subject knowledge and teacher absenteeism, and in the three years since it began has not had a significant impact on children's learning.

The evaluation suggests three key **recommendations** (Chapter 9, p. 89) for the programme and for similar initiatives in northern Nigeria. First, teachers' subject knowledge remains insufficient and improving subject knowledge must be a priority. It is not clear whether interventions such as TDP's Reading Programme will be sufficient to achieve the basic levels of subject knowledge that teachers need. Arguably, improving subject knowledge should be the main focus of any training, rather than being an add-on to pedagogical training. Second, programmes should focus on improving the use of Hausa as a language of instruction in the early grades. Official policy is clear in setting Hausa as the language of instruction in Primary 1–3, but common practices and textbooks often push teachers back towards using English, despite having insufficient English literacy themselves. Third, there is a need to improve school management, particularly

to ensure teachers are present in the classroom and teaching, perhaps through boosting the role of school-based management committees (SBMCs).

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List of abbreviations

DFID	Department for International Development (UK)
EDOREN	Education Data, Research and Evaluation in Nigeria
ESSPIN	Education Sector Support Programme in Nigeria
LGA	Local Government Authority
LGEA	Local Government Education Authority
NCE	National Certificate of Education
NEDS	National Education Data Survey
NGN	Nigerian Naira
OPM	Oxford Policy Management
P1–6	Primary 1–6
QA	Quality Assurance
RANA	Reading and Numeracy Activity
SBMC	School-Based Management Committee
SD	Secure digital (memory card used in mobile phones)
SSV	School support visit
SUBEB	State Universal Basic Education Board
TDP	Teacher Development Programme
TDT	Teacher Development Team
TF	Teacher facilitator
UNICEF	United Nations Children’s Fund

1 Introduction

1.1 The evaluation

The Teacher Development Programme (TDP) is a six-year (2013–19) programme funded by the UK Department for International Development (DFID), with a total budget of £34 million. It seeks to improve the quality of teaching in primary schools, junior secondary schools, and colleges of education at the state level in northern Nigeria. It works through in-service training for primary teachers, reform of pre-service teacher education, and strengthening evidence-based research on teaching. This evaluation focuses on the first of these: in-service training and support for primary teachers in the three core curriculum subjects of English, mathematics, and science. The programme initially operated in Jigawa, Katsina, and Zamfara states, and was later extended to Kaduna and Kano. This evaluation focuses on a group of schools that were randomly assigned to receive the intervention in Jigawa, Katsina, and Zamfara, and a control group of schools in the same states that did not receive the intervention.

The impact evaluation has three main purposes:

- **Formative** – to help inform the implementation of TDP in Phase 1 of in-service activities and the design and implementation in its Phase 2;
- **Summative** – to help inform TDP, DFID Nigeria, and other education stakeholders if TDP’s in-service teacher training activities have led to improvements in teacher effectiveness and pupil learning levels in English, mathematics, and science and technology; and
- **Learning** – to assess from TDP what might work for improving teacher effectiveness in Nigeria and elsewhere.

The overarching evaluation questions for the endline impact evaluation are set out in Table 1.1. The earlier baseline research (De *et al.*, 2016a) covered the relevance of the programme to the northern Nigeria education and policy context and the given priorities and constraints in the region. The endline research focuses on the efficiency, effectiveness, impact, and sustainability, as well as looking again at some aspects of its relevance.

Table 1.1: Overarching evaluation questions

OECD-DAC evaluation criteria	Overarching evaluation questions	Formative / summative
Efficiency	Were TDP results achieved on time and to plan?	Summative and formative
	How does TDP’s organisational set-up facilitate delivery?	
Effectiveness	Has TDP led to changes in teacher effectiveness?	Summative
Impact	Has TDP caused changes in pupil learning in English, mathematics, and science in TDP schools?	
Sustainability	Are TDP’s impacts on teacher effectiveness sustainable without further DFID support?	

The main target audience for this report is those involved in making education policy at the state and federal level in Nigeria, as well as the staff of DFID and other donors and DFID-funded programmes, including TDP. It is also hoped it will be of use for policy-making and programming in other countries experiencing similar issues around improving teaching and learning in primary schools.

The main sources of data for this evaluation are a panel survey of 330 schools in Jigawa, Katsina, and Zamfara conducted in October 2014 and October 2017, and qualitative studies conducted around the same

time in a sub-set of nine schools which received TDP intervention, as well as with SUBEB officers and TDP staff. The baseline and endline were timed to allow sufficient time for impact on pupil learning outcomes to be feasible, while also ensuring that a panel of pupils could be sampled at baseline and endline within the same school, and producing results in time for them to be of value to the final stages of the programme.

The evaluation fieldwork was carried out by OPM Nigeria and Education Data, Research and Evaluation in Nigeria (EDOREN). It builds on earlier reports presenting findings from the baseline research (De *et al.*, 2016a). It draws on several other pieces of primary research, including a qualitative formative research study (Doyle *et al.*, 2016), a review of the programme’s implementation (Durrani *et al.*, 2018), and a validation survey on teacher and pupil attrition (Cameron and Pettersson, 2017). The sample of pupils, head teachers, and teachers for the quantitative survey panel is shown in Table 1.2.

Table 1.2: Endline quantitative survey panel sample sizes

Survey instrument	Endline sample sizes ¹
Pupil learning assessment in English, mathematics, and science (panel pupils, in Primary 6 at endline)	1,566
Head teacher interviews (panel head teachers)	134
Teacher interviews (panel teachers)	447
Teacher development needs assessment in English, mathematics, and science (panel teachers and head teachers)	556
Classroom observations (panel teachers and head teachers who teach Primary 1 to 6)	494
Teacher roster and background (all teachers at the school) ²	329
Classroom attendance (all classrooms)	330

Notes: (1) This is the sample size for respondents still present at the same school at endline. (2) Excludes teachers who only teach religious studies.

1.2 Structure of this report

This report is divided into two volumes. The present volume is intended to provide a relatively concise overview of key results with a clear narrative. The following chapter briefly describes the quantitative and qualitative methods used in this study. Chapter 3 describes the TDP intervention and how it has changed over time. Chapter 4 describes the context in which TDP has operated and considers how this helped or hindered the programme’s effectiveness. Chapter 5 focuses on school leadership and management, examining changes over time and asking whether TDP intervention has resulted in improved practices. Chapter 6 covers teachers, asking whether teachers’ subject knowledge, use of effective practices in the classroom, and attendance have improved as a result of TDP. It also examines levels of teacher motivation and the factors that affect teacher motivation. Chapter 7 examines pupil learning outcomes in English, mathematics, and science, and assesses the evidence on whether TDP has had a positive impact. It also considers pupils’ perceptions about their own learning and experience of being in a school that has received TDP intervention. Chapter 8 considers whether TDP is likely to be sustainable once the programme’s funding has ended. Chapter 9 summarises the key findings and presents recommendations for TDP and other stakeholders in Nigeria and elsewhere.

Volume II provides more technical detail on methods; full tables of quantitative results; the evaluation framework; and information on permits for the research, consent, confidentiality, sharing of data, and processes around stakeholder engagement and impact.

2 Methods

This evaluation uses a mixture of quantitative and qualitative methods, including a survey of schools and qualitative fieldwork in 2014 and 2017. It also draws on other pieces of research conducted through EDOREN, including a qualitative formative study of TDP carried out in 2015, and an implementation review and telephone validation survey carried out before the main survey in 2017. The following sections describe the main quantitative and qualitative components briefly; fuller descriptions can be found in Volume II.

2.1 Quantitative methods

In the three states where TDP initially operated – Jigawa, Katsina, and Zamfara – 330 schools were surveyed in 2014 and 2017. Key to the evaluation was a randomised design, with half of the schools assigned to receive TDP treatment, while the others were assigned to a control group. This report uses the term ‘treatment schools’ to refer to the group of schools within the survey sample which received the TDP intervention, and ‘control schools’ for the similar set of schools that were not selected to receive the intervention.

2.1.1 Quantitative survey

Within each school in the sample, head teachers were asked to select three teachers to participate in the programme, before the school had been assigned to the treatment or control group. In treatment schools, these three teachers, plus the head teacher, then received the TDP package of support and training, while in control schools no TDP intervention was provided. The survey included interviews with the selected teachers and head teacher; lesson observations of the selected teachers (including the head teacher if he or she taught lessons); and a teacher development needs assessment (TDNA) covering English, mathematics, science, and skills in measuring pupils’ progress. At baseline, eight pupils were selected randomly from those who started Primary 3 in September 2014, who were taught English, mathematics, or science by at least one of the sample teachers, and who were present in school on the day of the survey. Tests of English, mathematics, and science, and a brief interview on background characteristics, were administered to these pupils. At endline, in 2017, the same teachers and pupils were interviewed and tested again, to the extent that they could be found in the same schools (see Section 2.1.4 on sample attrition). By endline, most of the pupils were in Primary 6, and were administered a test appropriate to that grade.

This report draws heavily on descriptive statistics from the survey. Average values for a large number of indicators, disaggregated by treatment/control group and by baseline/endline, were estimated with survey weights. Detailed statistical tables showing standard errors, sample sizes, the 10th and 90th percentiles, and 95% confidence intervals for each indicator can be found in Volume II. The results presented in this report are representative of the treatment and control clusters in the 14 local government authorities (LGAs) selected by the programme. The survey does not aim to be representative of the three states as a whole. Nonetheless, the evaluation team believe that the results of this survey are likely to be broadly similar to those one would find with a state-representative sample.¹

¹ Representative school surveys such as that conducted for Education Sector Support Programme in Nigeria (ESSPIN) in six states, and household surveys such as National Education Data Survey (NEDS), provide broad support for the findings presented here.

2.1.2 Assessing the impact of TDP on key outcome indicators

This evaluation aims to estimate the causal effect or impact of TDP on four key indicators (Box 1).² The evaluation team used the data collected via the school survey at endline and baseline in treatment and control areas to assess whether TDP had affected pupil learning outcomes in English, mathematics, and science, and whether it had had intermediate outcomes related to teacher effectiveness in treatment schools.

Box 1: TDP Quantitative impact indicators

Indicator Im-1a: Percentage change in mean scores in English, mathematics, and science and technology for pupils in TDP schools (pupils tested in P3 at baseline and in P6 at endline)

Indicator Im-1b: Change in the proportion of pupils in the bottom and top performance bands in English, mathematics, and science and technology, respectively (pupils tested in P3 at baseline and in P6 at endline)

Indicator Effe-1: Percentage change in time teacher involves pupils in positive interaction during lesson (% of total lesson time)

Indicator Effe-2: Percentage change in average daily absence from school (% of teachers)

Indicator numbers refer to the TDP Evaluation Framework.

At baseline, and in consultation with TDP, the TDP intervention was assigned randomly across schools. This means that random assignment of TDP was ensured through the design of the programme's pilot. The preferred strategy for estimating the impact of TDP on the indicators above was to make use of this random assignment (see Cameron *et al.*, 2017). When treatment is randomly assigned, the difference between the average change over time in the treatment group and the average change over time in the control group represents the causal impact of the intervention.

The use of randomisation for impact analysis depends on the random assignment being maintained when the intervention is actually implemented. In practice, however, the TDP intervention was not implemented in some schools that had been assigned to the treatment group and was implemented in some schools that had been assigned to the control group. These issues, known as non-compliance and sample contamination, respectively, are explored in more depth in Section 2.1 and in Volume II.

Impact estimation results presented in this report are therefore based on an amended estimation strategy, as set out in the evaluation's endline plan (Cameron *et al.*, 2017). This estimation strategy uses an instrumental variable approach to estimate the causal effect of TDP training being implemented in a school. The strategy uses the fact that, in contrast to treatment *implementation*, treatment group *assignment* can still be considered random and can therefore be used to explain random variation in whether TDP was actually implemented in a school or not. This random variation can then be used to estimate the effect that TDP training implementation had on the outcome indicators listed above.

This is a two-step process that aims at filtering out the non-random parts of TDP intervention and hence estimating robustly the effect that this intervention had. The following paragraphs touch on some technical aspects of this estimation procedure. It is important to note that estimation results have been comprehensively cross-checked with alternative estimation procedures. (Full details are given in Volume II, Chapter 3.) Readers less concerned with technical details of this estimation strategy can skip to Section 2.2, which explains how to interpret the results presented in this report.

² It was planned to estimate the effect of TDP on a fifth set of indicators relating to teacher subject knowledge. However, treatment group teachers were given preparation on completing subject knowledge tests which is likely to bias results, meaning that it would add little value to conduct detailed impact analysis using these indicators. However, descriptive statistics are still provided on teachers' subject knowledge (Chapter 6).

Estimating treatment effects in a randomised experiment under non-compliance: using treatment assignment as an instrument

The key problem that an instrumental variable approach as used in this evaluation tackles is non-compliance in treatment implementation. In the present case this refers to schools in the treatment group in which, according to TDP programme records, TDP was not implemented (these are non-compliers because these schools did not comply with their treatment status) and to schools in the control group in which TDP was implemented (these are non-compliers because these schools did not comply with their control status). The issue is that simply comparing outcomes across schools in which TDP was implemented with schools in which TDP was not implemented might introduce selection bias because training implementation is not random. Using treatment assignment as an instrument for training implementation allows identification, in a two-step process, of the random component in treatment implementation that is due to the treatment assignment and then estimation of the effect that this has on our outcome of interest. For this approach to be appropriate, two key conditions generally need to hold:³

The first assumption, **instrument relevance**, in the context of this evaluation refers to whether treatment assignment is related strongly enough to receipt of treatment. Roughly speaking, this means that the probability of teachers actually being trained with TDP should be higher in schools that were assigned to the treatment group than in schools that were assigned to the control group. This assumption can be tested, and the results presented in Volume II show that this is the case in the present evaluation.

The second assumption, **instrument exogeneity**, refers to the relationship between treatment assignment, receiving treatment, and treatment effects on outcomes of interest. For treatment assignment to be truly exogenous, and therefore be a valid instrument, the causal effects of treatment assignment should only materialise via receiving treatment, and not via any other channels. In other words, treatment assignment should affect the probability of actually receiving treatment, which in turn might affect the outcome of interest, but there should not be any other channel via which treatment assignment might affect the outcome of interest. This assumption cannot be tested directly. Volume II, Chapter 3 delineates in detail why it is reasonable to assume that it holds here.

Supplementary analysis: robustness checks

The results presented in this report have been extensively cross-checked using alternative estimation procedures. These involved, for example, selecting covariates to control for using machine learning methods, exploiting the panel structure of the data fully, and using fixed-effects estimations. These results are presented in Volume II, Chapter 3. In general, impact estimation findings presented in this report are robust to different types of estimation procedures. Any sensitivity to estimation techniques is also mentioned in the impact boxes in this volume.

2.1.3 Risks to the impact assessment strategy

Sample contamination and non-compliance

The risk of contamination and non-compliance with treatment assignment in this impact evaluation arose from two main sources: contamination and non-compliance with TDP itself and contamination by other education interventions.

As described above, this impact evaluation originally followed an experimental design in which treatment was randomly assigned (see Cameron *et al.*, 2017). However, non-compliance with this design and sample contamination required an amended impact estimation strategy, as discussed above. Furthermore, a set of

³ Strictly speaking, a third assumption needs to hold here; this is the monotonicity assumption (sometimes called the no-defier assumption). We explain why this assumption holds here in Volume II, Chapter 3.

other large donor-funded programmes (in addition to TDP) have been working in Jigawa, Katsina, and Zamfara during the evaluation period from October 2014 to October 2017 to improve the quality of primary education, in addition to SUBEB-led training. Although interventions differ, they share the overall common objective of improving pupil learning and include some type of teacher training aimed at improving teaching skills. These programmes are described in more detail in Volume II, Chapter 3.

From an impact evaluation perspective, a differential implementation of non-TDP interventions in the sampled treatment and control schools may lead to an overestimation or underestimation of the impact of TDP. For instance, if a training programme other than TDP was implemented in all the control schools but not in the TDP treatment schools, and the impact indicators in control schools improved as a result of the other training, then the evaluation would underestimate the impact of TDP.

This evaluation used programme record data – provided by TDP and other programmes on where training was implemented – to assess the extent of sample contamination and non-compliance and address them when estimating the impact of TDP. Programme records data contain school and teacher level data on training provided to teachers and head teachers. Schools were classified according to whether one or more teachers had received treatment from TDP or other providers.

Results

Figure 2.1 below presents the exposure of schools assigned to treatment and control groups for this evaluation to TDP training and to other education programmes.

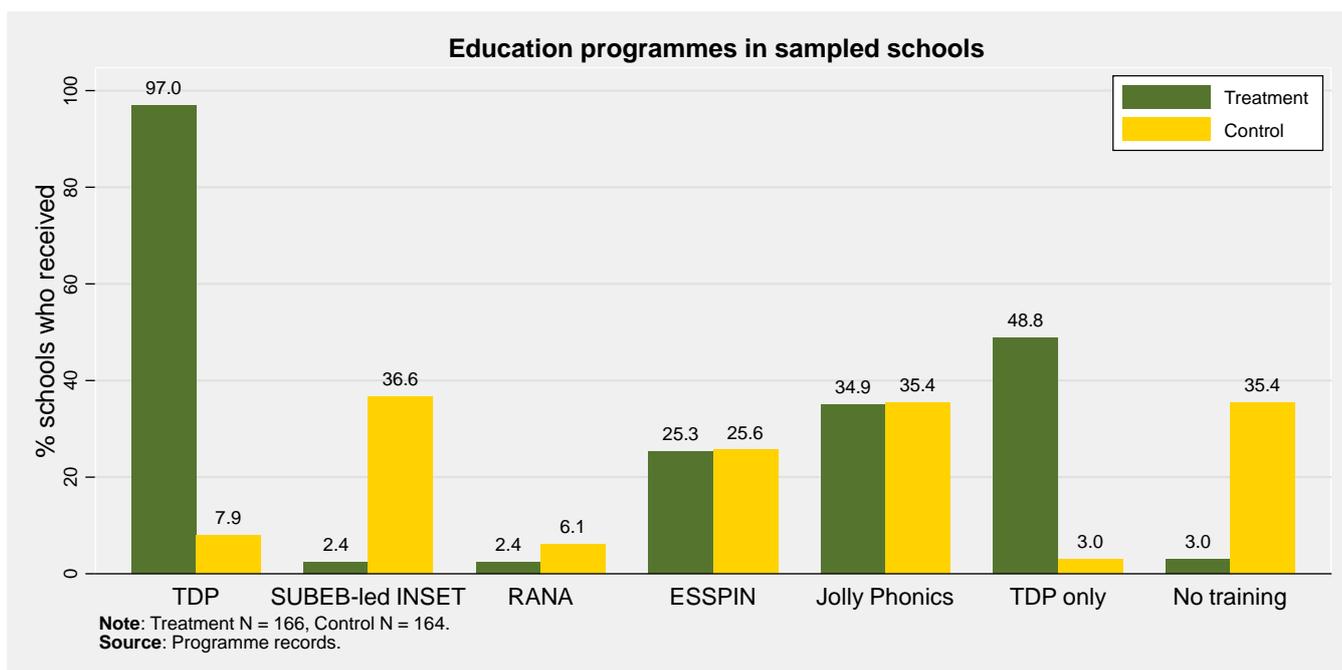
TDP compliance in the treatment group is high: 97% of the treatment schools have received TDP training. Therefore, TDP treatment coverage among schools assigned to the treatment group is near universal. A challenge arises, however, from the parallel implementation of other education interventions in TDP treatment schools: in only 49% of treatment schools was TDP the only training programme implemented.

According to the programme records data, TDP implementation is less design-compliant in the control sample; 8% of the schools in the control group received TDP intervention. Around 35% of the control schools received no training from any programme.

As discussed earlier, differential contamination of the study sample is the primary concern for impact estimation. The figure below shows that such differential exposure may be problematic in the case of two programmes: the UNICEF Girls' Education Project 3 Reading and Numeracy Activity (RANA) and, especially, SUBEB-led in-service training based on the TDP model (see Chapter 3), which was implemented in 2% of treatment schools compared to 36% of control schools.⁴ Not controlling for such differential contamination might lead to an underestimation of TDP impact, given that control schools might show improved outcome indicators as a result of the SUBEB-led training.

⁴ See Volume II, Chapter 3 for a description of these programmes.

Figure 2.1: Education programmes in sampled schools



Dealing with sample contamination and non-compliance

To deal with contamination by non-TDP programmes in control and treatment schools, this evaluation uses programme records data to account for training provided by other education programmes throughout the impact analysis. The estimation procedures include indicators for other programmes as covariates. This means that this evaluation used existing data on whether certain programmes were implemented in control and treatment schools in any impact analysis, to control for changes in outcomes that might be due to these programmes. By including such covariates, these models are correcting for any improvements in outcome indicators that might not be due to TDP but to the implementation of other programmes.

It is not possible to systematically control for non-compliance or contamination in the descriptive statistics presented throughout this report, and possible bias due to sample contamination and non-compliance should be kept in mind when interpreting these findings.

2.1.4 Sample attrition

The evaluation collected longitudinal data from TDP treatment and control schools. This means that the survey was implemented in the same set of schools at baseline and endline and that within those schools the objective was to collect data from the same groups of pupils and teachers. Collecting such longitudinal data in impact evaluations is beneficial as it makes it possible to compare changes over time for the same group of individuals in treatment and control groups or to control for the baseline background characteristics of individuals in impact estimation analyses.

When relying on longitudinal data, drop-out of units of observation between baseline and endline – attrition – can pose a risk to the impact evaluation strategy. Attrition can be due, for example, to pupils moving away between baseline and endline, or teachers being posted to new schools. An extensive analysis of how attrition affected the evaluation is presented in Volume II, Chapter 3. Key results are summarised here.

Table 2.1 below presents attrition rates for key units of observation used in this impact evaluation. As can be seen, endline data was collected from all schools that were also visited at baseline. However, 51% of teachers interviewed at baseline and 39% of pupils interviewed at baseline dropped out of the sample and could not be re-interviewed at endline.

Table 2.1: Attrition rates for key units of observation

Unit of observation	Baseline sample size	Endline sample size	Attrition rate
Primary schools	330	330	0
Teacher interviews	908	447	51%
Pupil learning assessment in English, mathematics, and science	2,575	1,566	39%

Such attrition could affect the impact assessment strategy in two main ways. First, high levels of attrition can decrease the sample size that can be used to estimate programme impact, as analyses are run using the non-attrited sample only. The *minimum detectable effect* in a quantitative study of this sort – that is, the smallest effect that can be reliably detected with statistical significance – depends on the sample size. A smaller sample size means that only larger effects can be identified. As a result, with higher levels of attrition, the effect of TDP implementation must be larger in order for the impact assessment analysis to identify it as being statistically significantly different from zero. Calculations performed for the purposes of the endline plan (Cameron *et al.*, 2017) show that the set-up of this impact evaluation is robust to even high levels of attrition, such as the ones presented above. This means that even with these levels of attrition, the impact assessment strategy should be able to identify TDP effects of roughly the size that it was originally intended to identify. Full calculations are presented in Volume II, Chapter 3.

Second, differential attrition could affect the comparability of units of observation across treatment and control groups, if teachers or pupils with different characteristics dropped out of treatment schools compared to control schools. Hence, the remaining sample in control schools would not be an appropriate counterfactual to the sample in treatment schools. The evaluation here tested whether this was the case by using baseline data to compare individuals who did not drop out of the sample over time across the treatment and control groups, and by assessing whether treatment status was correlated significantly with the likelihood of individuals dropping out of the sample.

Overall, these analyses showed that there is very little evidence for differential attrition in the pupil sample. For the teacher sample, teachers in the treatment group were less likely to drop out of the sample and those teachers who remained in the sample in treatment schools were based in schools with lower levels of teacher absenteeism than teachers who remained in the sample in the control schools. However, in other respects there is no evidence for differential attrition of teachers. The full results of these analyses are presented in Volume II, Chapter 3.

Mitigation strategy for possible differential attrition

This evaluation dealt with the risk posed by differential attrition in three main ways. First, as discussed above, a detailed attrition analysis was implemented to clarify the extent to which it was problematic and to identify the characteristics of units of observation that might be correlated with attrition status. Second, at impact analysis stage, those characteristics were included in econometric models to control for observable characteristics that might introduce selection bias via differential attrition. Finally, extensive robustness checks via alternative estimation models were implemented. These made it possible to control for the unobservable background characteristics of individuals, which might, in turn, be related to systematic differences between the treatment and control groups possibly introduced by differential attrition. The results of those robustness checks are presented in Volume II, Chapter 3.

2.2 How to read and interpret graphs that present impact estimates in this report

The choice of impact estimation methods mentioned above – to use treatment assignment as an instrument for treatment implementation – has subtle but important implications in terms of how impact estimates presented in this report should be interpreted. The estimates need to be interpreted as the average causal effect of TDP training implementation for those pupils or teachers from schools that complied with their treatment status (see Volume II for more detail).⁵

In this volume, impact estimates are presented in boxes to distinguish them from the descriptive statistics presented elsewhere. Each impact box contains a graph and explanation: see Impact Box 1 in Chapter 6 (p. 59). Each graph shows point estimates for treatment effects (Local Average Treatment Effects) on outcome indicators and 95% confidence intervals for these effects. This means that the probability that the true treatment estimate will fall within this area is 95%. When the confidence intervals of such estimates do not overlap with zero, this is an indication that this treatment effect is truly different from zero. The results of robustness checks and other supplementary analyses are presented in detail in Volume II, Chapter 3.

For the descriptive statistics on head teachers' management and leadership presented in chapter 5, it should be noted that the quantitative survey measured the frequency of these behaviours, for example, lesson observations, but did not examine the quality of them.

2.3 Qualitative methods

2.3.1 Sampling

Per state, three treatment schools in different LGAs were sampled. The research team used a stratified purposive sampling approach based on composite indicators of baseline survey results. The theory-based assumptions underlying this approach were: a) a positive correlation between pupil performance (literacy and numeracy) and TDP impact; b) an inverse relationship between class size and TDP impact; and c) a negative correlation between teacher absenteeism and TDP impact. The composite score was used to form strata of good-performance, average-performance, and low-performance schools. In each state, three schools were randomly drawn per strata.⁶ Schools with head teacher transfers over the last years were excluded from the sample,⁷ based on the findings of the validation survey.⁸ In a final stage, due to security policies, schools in remote areas were excluded from the sample. All schools visited were within a radius of a three-hour travel time to urban centres.⁹

2.3.2 Selection of respondents

Pupils: One group of five to six Primary 6 pupils was selected for the participatory research activity. Where possible, the research team included an equal number of female and male pupils. Research activities were held with either a group of female pupils or a group of male pupils. The research team tried to ensure that there was a balance between activities and gender. Pupils self-selected into partaking, often with encouragement by the teachers or head teachers.

Teachers: Only teachers of the TDP-relevant subjects, English, mathematics, and science, were selected for classroom observations and subsequent discussions. Participatory activities were conducted with groups of

⁵ In technical terms, the impact estimate are Local Average Treatment Effects or Complier Average Causal Effects.

⁶ One sampled school, and two replacement schools.

⁷ The research team assumed that a recent change in head teachers would affect the potential outcomes and impact of TDP.

⁸ A caveat here is that head teachers were transferred after the completion of the validation survey. In all but one school, the validation survey provided reliable data for this sampling stage.

⁹ The research team replaced one school in Zamfara.

five to six teachers of all subjects. Non-TDP teachers were excluded from the timeline activity but were included in other group discussions.

See Volume II for details on how other respondents were selected.

2.3.3 Data collection tools

The qualitative research was conducted using a range of instruments, such as interviews, observations, and participatory tools (most significant change activity, proportional piling activity, timeline tool, force field analysis, and school transect walks).¹⁰ In addition, the research team used observations (school-level and classroom-level) and follow-up discussions. Research guides were developed to guide data collection and allow for inter-school and inter-state comparison. All interviews were conducted in a semi-structured manner to accommodate context-specific probing and flexibility to explore new areas. Research activities included Primary 6 pupils, teachers, head teachers, SBMC members, teacher facilitator (TF) and Teacher Development Teams (TDTs), as well as SUBEB and state-level education representatives.

2.3.4 Field work

Seven local researchers were trained in Abuja and paired into three research teams, each comprising one female and one male researcher, with one Nigerian team leader. International researchers joined the teams at the start of the project to provide support and ensure quality and direction in the field work. Researchers took detailed notes. Additionally, where possible, interviews were recorded and later transcribed.¹¹ During the research, the composition of teams was changed, to counter researcher fatigue and promote exchange and discussions among the teams. Each team visited one school per state for three consecutive days.

2.3.5 Debriefs and team checks in the field

The researchers conducted daily debriefs to provide preliminary analysis of the day's findings. Emerging trends were identified and research gaps or areas of interest highlighted by the group, facilitating learning across teams. This allowed international researchers to provide support or inputs and to monitor progress. The field work was concluded by a three-day debrief workshop. This facilitated a first extraction of themes, as well as comparative analysis between schools and states.

2.3.6 Approach to analysis

Audio research files were transcribed and translated. This, in addition to detailed notes, formed the basis for coding and analysis. An initial coding framework was developed, using the evaluation questions, as well as emergent themes from debriefs. Before coding, the research team integrated individual coding frameworks and nodes to ensure consistency and facilitate inter-state comparison. Coding was carried out using NVivo 11 and undertaken manually. In order to analyse the data, the researchers weighed statements in the light of the knowledge, incentives, and context of the respondent. In order to ensure rigour, researchers sought to triangulate findings with other qualitative data. This process of triangulating and bringing together the quantitative and qualitative findings was iterative throughout the analysis and writing process.

2.3.7 Limitations and mitigation strategies of the qualitative research component

Researcher bias: Any research risks response bias, especially when respondents interpret questions as having a 'correct answer'. In order to mitigate this, the evaluation team triangulated respondents' answers within

¹⁰ Refer to Volume II for a detailed description of methods used.

¹¹ During the transect walk, for example, it was not possible to record the discussion as the group of pupils were moving around the school throughout the discussion. In this case, detailed notes were used in the analysis.

tools and between respondents. Additionally, research guides were designed to include probes to each core question to mitigate bias. During the researcher training, strategies to mitigate research bias, including bias based on the power dynamics between researcher and respondents, were identified and addressed by the team. Research guides were jointly translated from English to Hausa to avoid the use of loaded terminology and ensure consistency. Research bias was also addressed in debriefing sessions. Researcher bias also applies to the analysis. Saldana (2013) states that coding is a matter of judgement and it is important to be aware of the influence of personalities and predispositions. This risk was mitigated through reflection and awareness, and the cross-reading of transcripts and coding frameworks by other researchers, as well as a workshop to discuss findings and their interpretations.

Hawthorne effect: To mitigate the risk of biased observations and teachers ‘performing’, research teams conducted classroom observations on the first day of visiting the schools, where possible to avoid the artificial grouping of pupils or the display of TDP materials. Team notes on classroom observations record both observed teacher practice, as well as the interpretation and impressions of the researchers. These were considered in the analysis of teacher effectiveness and pedagogy.

Sampling bias: A key objective of the qualitative sampling strategy was to understand the impact and pathways of TDP in different contexts. Therefore, the sampling strategy allows us to understand how *some* schools experience and perceive TDP but is not representative of all schools nor generalisable. The use of case studies allows us to better understand the impact of the programme in varied contexts and environments, as well as to clarify common, recurring, overarching themes. While the sample excludes very remote schools, it allows for schools embedded in urban, semi-urban, and rural contexts. To mitigate the impact of restrictive security policies, local research teams visited the two states, Katsina and Zamfara, without international researchers.

For a more detailed discussion of limitations and biases, refer to Volume II.

3 The TDP intervention

This impact evaluation covers TDP Output 1: improving in-service training for primary teachers in English, mathematics, and science and technology. This chapter starts with a brief overview of TDP and its theory of change. It then describes in some detail the four main activities under TDP Output 1: teacher in-service training; development and distribution of TDP materials and technology; ongoing teacher support through school visits; and leadership and management training for head teachers. This is followed by the endline findings related to implementation of the four main activities.¹²

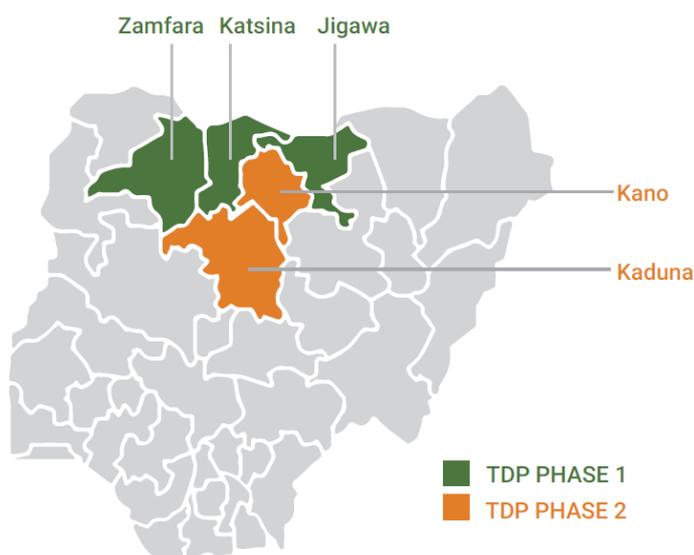
Section 3.3 in this chapter draws heavily on the TDP implementation review carried out in mid-2017 by the impact evaluation team to examine TDP efficiency and selected aspects of effectiveness (see Durrani *et al.*, 2018).

3.1 Overview of the TDP intervention

TDP is a six-year (2013–19) DFID-funded education programme seeking to improve the quality of teaching in primary schools, junior secondary schools, and colleges of education at the state level in northern Nigeria. In its Phase 1 (2014–2016), TDP operated in Jigawa, Katsina, and Zamfara, and was extended to Kano and Kaduna states during Phase 2 in late 2016. The objective of TDP is to increase teacher effectiveness, ultimately to raise pupil learning levels, by:

- Improving **teacher in-service training** for primary teachers in the three core curriculum subjects of English, mathematics, and science and technology (Output 1);
- Improving the effectiveness of teacher educators of primary teachers by reforming pre-service teacher education (Output 2); and
- Strengthening evidence-based research to influence and inform policies on teacher effectiveness and efficiency (Output 3).

Figure 1: States covered in TDP Phase 1 and Phase 2



¹² TDP Output 1 does not explicitly address equity, exclusion, or poverty but indirectly does so through its coverage of some of the poorest states in Nigeria with large proportions of out-of-school children and gender-based education differences.

3.2 TDP's theory of change

The design of TDP's Output 1 is informed by a theory of change that articulates how the in-service teacher training activities are meant to result in the desired outcomes (improved teacher subject and pedagogical knowledge); intermediate impact (increased teacher effectiveness); and final impact (improvement in pupil learning levels). Underlying assumptions are set out in Annex A.

The theory of change was expanded by the evaluation team during the development of the evaluation framework prior to the baseline research (see EDOREN, 2014), and the evaluation questions and assumptions to be examined by the evaluation were developed from this. After one year of programme implementation, four more assumptions were added to the theory of change:

- Given the low level of teacher competence, teachers need to receive a more intensive and broad-based training;
- A stronger emphasis on improving teacher subject knowledge is necessary;
- Teachers need to receive local support over a sustained period of time to consolidate their learning; and
- Pupils will also benefit from direct access to educational technology.

The theory of change was updated by the programme and shared with the evaluation team in October 2017 (Box 2 and Annex A), at which point the endline research was at the fieldwork stage. The evaluation design and research tools are based on the earlier theory of change, but to the maximum extent possible this report also assesses the key propositions and assumptions in the updated theory of change.

Box 2: Key propositions and assumptions of TDP's strategy

The key propositions of TDP's strategy relevant to Output 1 are:

- An expanded cadre of local trainers and quality assurance officers will provide teachers with ongoing, in-situ support.
- Head teachers' leadership role and management functions significantly influence the potential effectiveness of classroom teachers.
- Teachers will be trained primarily to be classroom teachers rather than subject teachers.
- Teachers of all capabilities and length of service will benefit from an intensive one-year in-service training to improve their content knowledge and ability to teach this content.
- The use of technology for self-learning is key to the learning of pupils and the professional development of teachers.
- Increasing teachers' English proficiency is a critical component of improved (classroom and subject) teaching.

TDP's key assumptions underlying each of these propositions remain that:

- More intensive and broad-based training is an effective means of raising the competence of the current cohort of in-service teachers.
- Head teachers have the autonomy and resources in the current system to exercise leadership and management skills.
- Subject content knowledge can be acquired indirectly through the pedagogy training and self-learning facilitated by access to educational technology.
- Support and mentoring will be provided of sufficient intensity and quality to consolidate learning of existing teachers and student teachers.

- CPDC training is an effective means of raising the competence of the current cohort of teacher educators.

Source: TDP 2017

The endline research covers the results part (outcomes and impacts) of TDP's theory of change, with the aim of measuring changes in the selected outcomes that the programme is seeking to influence and of exploring how these changes came about. The implementation part (activities and outputs) of the theory of change was examined by the TDP implementation review (Durrani *et al.*, 2018), and findings on implementation based on the endline quantitative and qualitative fieldwork are presented below.

3.3 Evolution of TDP Output 1 since baseline

TDP Output 1 aims to make teachers more effective through pedagogical training combined with the creation of a supportive teaching environment. This is to be achieved by improving head teachers' mentoring and supervision of teachers; school support visits; and the provision of teaching and learning materials for teachers (Durrani, 2017). More effective teachers are assumed in turn to lead to improved pupil learning levels.

3.3.1 TDP activity 1: teacher in-service training

TDP has provided in-service training to four different cohorts of teachers over the implementation period so far. These can broadly be classified as follows:

- **Cohort 1A:** In each of the initial 504 TDP pilot schools, four teachers (including the head teacher) were selected to receive the TDP teaching training from December 2014 to April/May 2016. The teachers in this evaluation's treatment group were all in Cohort 1A.
- **Cohort 1B:** Additional teachers in the TDP pilot schools were selected with the intention to cover at least 60% of teachers in each participating school; they received TDP teaching training, starting in September 2015, and then joined Cohort 1A to complete training together.
- **Cohort 1C/Teacher Residency Training Programme:** In Zamfara, 224 new teachers from non-TDP schools and then another 200 teachers received training under the first and second phase of the Teacher Residency Training Programme. This cohort started training in February/March 2016 and then joined Cohorts 1A and 1B to complete training together. According to programme records, some Cohort 1C teachers were in schools originally assigned as control schools for this evaluation.
- **Cohort 2/Scale-up teachers:** All remaining untrained teachers in the 168 TDP Phase 1 schools in each state were targeted to receive training in two periods: May–July 2016 and February–April 2017.

It was initially planned that teachers would attend 11 cluster training sessions of two days each over a two-year period for a total of 22 days. TDP later streamlined the model into a one-year programme with an additional focus on low-tech self-study. The training content was initially divided into 11 modules and covered aspects of general pedagogy (for instance, classroom language and use of teaching aids), and subject knowledge training in English, mathematics, and science and technology (Table 3.1). Training was initially pitched at the Primary 1 to Primary 3 level, and training on Primary 4 to Primary 6 level content started in January 2016.

Cohort 1A teachers were initially trained according to their subject area; in other words, a teacher received training on either English or mathematics, but in September–November 2015 these teachers also received training on the subject they had not previously been trained on. From Cohort 1B onwards, all teachers received training in both subjects. In September 2016, TDP had also begun to provide support to Primary 1–

3 teachers to teach letters and sounds, and reading in Hausa. In March/April 2017, TDP introduced the *Reading Programme* for all teachers at TDP Phase 1 schools, a 14-week training programme with interactions every two weeks between TFs and teachers to give attention to reading as a core, cross-cutting skill for both teachers and pupils, in recognition of teachers' low reading skills.

Table 3.1: Content of TDP training modules

Module	Pedagogy	English	Mathematics	Science and technology
1	Classroom language			
2	Teaching aids			
3		Developing reading skills	Numbers and numeration	
4		Developing writing skills	Algebra	
5		Listening skills	Geometry	
6		Speaking skills	Measurement	
7		Simple conversation	Number and numeration	Science process skills
8		Stress and intonation	Basic operations	Basic science
9		Comprehension	Everyday statistics	Basic technology
10		Grammar	Measurement	Information technology
11		Aspects of writing	Geometry	Health

Source: TDP 2017

Teachers in additional (non-TDP) schools in Jigawa and Zamfara received in-service training loosely based on the TDP training model funded by SUBEBs, the Universal Basic Education Council (UBEC), or the Global Partnership for Education. This training started in November 2016 or July 2017, depending on the state, and is referred to as 'the roll-out cohort'. This represents a roll-out of a TDP-style teacher training model but with important variations. In Jigawa, only two days of training were provided, not all the TDP modules and content were covered, and no school support visits were provided. In Zamfara, not all teachers from each school were trained and the Trainer in the Pocket (see section 3.3.2) was not given to teachers. In Katsina, there had been no roll-out as of July 2017, and there is no overlap between the LGAs where the roll-out is planned to take place and the sample schools.¹³

3.3.2 TDP activity 2: development and distribution of TDP materials and technology

A range of print materials was developed and distributed to teachers for self-study and for use in the classroom with pupils, including teacher's guides, lesson plans, wall posters, and flashcards. Some of the TDP materials that were distributed to each teacher for the first cohort of trained teachers were for later cohorts instead given to schools to be shared by teachers.

Cohort 1A teachers were each provided with a mobile phone loaded with audio-visual content – the Trainer in the Pocket – for self-study. For later cohorts this was revised to providing an SD card for use in teachers' own mobile phones. Two amplifiers were provided to each TDP school to allow teachers to play audio material in the classrooms.

3.3.3 TDP activity 3: ongoing teacher support

To provide ongoing in-school teacher support, TFs conduct school support visits to observe trained teachers and head teachers and to provide feedback. These visits are seen as a key part of the TDP teacher in-service

¹³ Details on the contents covered and number of days of training were not available.

training, and teachers were initially expected to receive two such visits per term. Cohort 1B in total had fewer school support visits than Cohort 1A teachers, who had received four visits earlier on.

Additional teacher support was planned for July–September 2017 to assist teachers with limited English language skills. The aim is to help teachers establish and run English Reading Clubs in primary schools, to enhance their English language skills, and provide them with guidance on effectively switching languages between Hausa and English.

3.3.4 TDP activity 4: in-service leadership and management training for head teachers

Head teachers were provided with training related to leadership and management skills starting in July 2015. This training was aimed at encouraging head teachers to conduct lesson observations and provide feedback to teachers; to lead weekly teacher professional development meetings supported by TFs as a platform for teachers to share best practice and receive additional training in school; and to develop strategies for promoting the attendance of teachers and pupils.

The school leadership and management training is a two-year programme, which was expanded during the course of implementation to two days per school term (a total of 12 days of training over two years), rather than the one day of training per year over two years originally planned. By March 2017, head teachers were halfway through the leadership and management training. This training was also enhanced to cover topics such as mentoring, assessment of pupils, and school self-evaluation.

Table 3.2 summarises the sub-activities and dates for the four main TDP activities.

Table 3.2: Summary timeline for main activities under TDP Output 1

Activity	Timing
Initial wave of TDTs and TFs trained.	May 2014
Cohort 1A teachers starts the in-service training.	December 2014 Cluster training 1 February 2015 School support visit 1 February 2015
Head teachers start the leadership and management training.	July 2015
Teacher's guides for pedagogy and Primary 1–3 (P1–P3) English and mathematics developed.	By August 2015
Cohort 1B teachers starts the in-service training.	Catch up training for cluster training 1–4 – September 2015 School support visit 1 October 2015
Cohort 1C starts the in-service training	February/March 2016
Head teachers receive leadership and management training 1.	April/May 2016
Cohorts 1A, 1B and 1C teachers complete the in-service training.	April/May 2016
Cohort 2/TDP scale-up teachers start in-service training.	May–July 2016
English and mathematics lesson plans for P1–P4 terms 1 and 2 and P5–P6 term 1 developed.	By August 2016
Head teachers receive leadership and management training 2.	August/September 2016
Support to TDP-trained teachers to teach sounds, letters and reading in Hausa.	September 2016
Cohort 2 teachers complete the in-service training.	February–April 2017
Roll-out cohort in-service training starts in non-TDP schools.	November 2016–July 2017
TDP Reading Programme starts.	March/April 2017
English and mathematics lesson plans for P6 term 2 developed.	May 2017
Science and technology lesson plans for P4 and P5 terms 1, 2, and 3 developed.	June 2017
English and mathematics lesson plans for P1–P6 term 3 developed.	July 2017
Training for teachers to establish English Reading Clubs.	Planned for July–September 2017

3.4 Findings on the implementation of the TDP teacher in-service training

Cluster training is at the core of TDP's support for teachers and takes the form of classroom-based training on pedagogical and subject content. It is intended to be held monthly for two days at a time. The cluster training sessions were led by TFs and TDP's TDTs (Durrani, 2017).

3.4.1 In-service training and Reading Programme coverage

The treatment teachers and head teachers were assigned to Cohort 1A.¹⁴ The results presented in this section are for teachers who were still at the same school at endline (the panel teachers). All of these teachers should have received the TDP in-service training. Given that TDP extended its in-service training over time to target all teachers in TDP schools, if for some reason these teachers were not trained as part of Cohort 1A they should, in theory, have been trained with Cohort 1B or Cohort 2 later on. The TDP in-service training coverage for Cohort 1A is generally high, with 92% of treatment teachers and head teachers reporting they received such training since baseline (Figure 3.1).

It is not clear why the remaining 8% of treatment teachers and head teachers report not having received TDP in-service training. Most are located in Zamfara, and in schools where other teachers report having received training. Overall, TDP to a very high degree followed its implementation plan in terms of which schools to provide training in, and in most cases the sample teachers were among those in Cohort 1A to receive training, as planned.

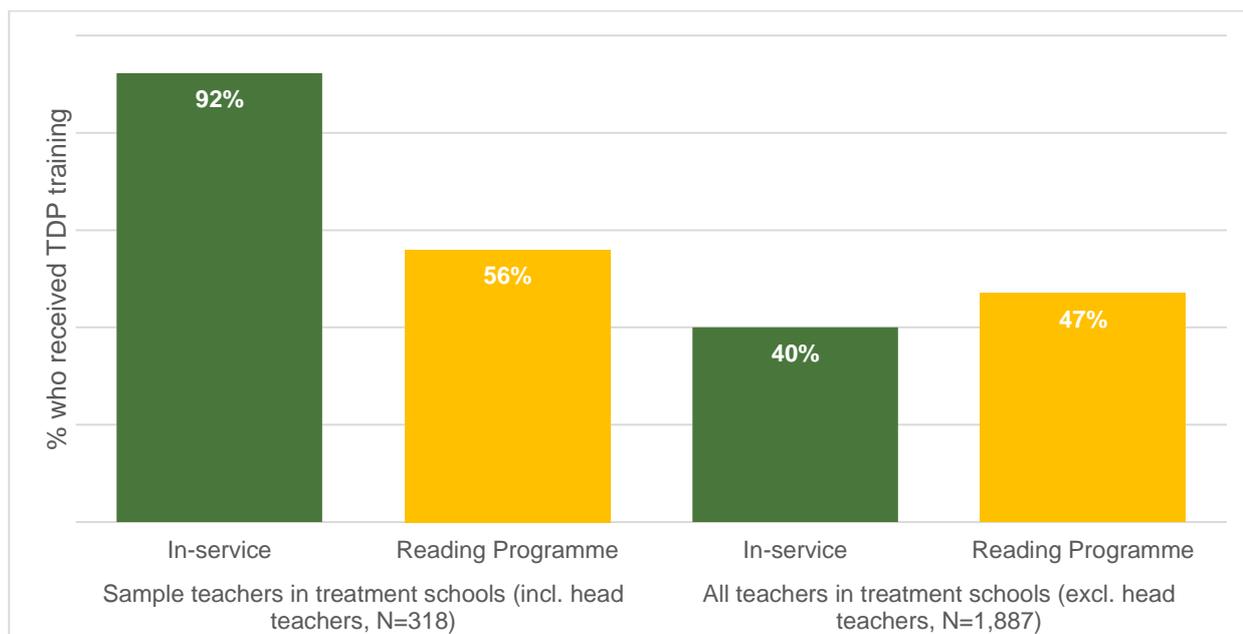
Under the TDP scale-up, all remaining untrained teachers in schools which received TDP intervention in the three states were meant to receive training (Section 3.1). According to data from head teachers on all primary teachers in treatment schools, 40% had received TDP in-service training (Figure 3.1).¹⁵ Head teachers' reporting on teachers at their school may not be complete, and some teachers might be recent transfers, but this is still a strong indication that TDP has not managed to reach all teachers at the TDP schools.

The Reading Programme introduced in March/April 2017 was targeted at all teachers at TDP schools in the three states (see Section 3.1), and by mid-October 2017, 56% of the treatment teachers and head teachers report having received this training (Figure 3.1). Coverage for all teachers at the treatment schools (again based on head teachers' reporting) is somewhat lower at 47%. The reason for the low coverage of the Reading Programme is not clear.

¹⁴ Based on the teacher sampling at baseline.

¹⁵ This excludes head teachers and teachers who teach only religious studies.

Figure 3.1: TDP in-service and Reading Programme coverage by endline



3.4.2 Trainers' ability to transfer the skills offered by the TDP training

Under the TDP cascade training model, TDTs were trained over two years, and received five days of training from international and national experts in Abuja, which they would then convey to the TFs during a three-day training session at state level.¹⁶

Across the states, TFs felt differently about the degree to which they were prepared by their training to conduct cluster training sessions (Doyle *et al.*, 2016).¹⁷ In Katsina, there was a general sentiment that the quality of the training had declined, as had the quality of cluster training sessions in terms of arrangement and materials. 'Sometimes they will just give you directive, go out and conduct so-so training, you are going to conduct so-so training without any preparations, no materials, nothing.' (TF, Katsina). On the other hand, TFs in Jigawa felt well-equipped by the training they received:

I also want to say, we are highly encouraged [...] because of the rigorous training which have been given from the TDTs. We are really stimulated, highly interested with regard to the training which has been given. The training which has been given has really exposed us, in fact, on how to deliver the step-down training to the teachers. So this is what we are really happy with. (TF, Jigawa)

3.4.3 Teacher in-service training length, content, and attendance

Initially, teachers were scheduled to receive 22 days of cluster training over two years. Among the teachers who reported receiving the TDP in-service training, they received on average 12 days per year in 2014/15 and in 2015/16. This suggests the treatment teachers who were assigned to Cohort 1A received, on average, the intended number of days of training. Teachers who attended the Reading Programme in 2016/17 reported attending nine days of training on average.

Attendance at the cluster training sessions in mid-2016 was generally reported to be quite good, demonstrating that teachers value the training, despite the obstacles they face in attending, such as personal commitments, especially when training is at the weekend, and the cost of transport (Doyle *et al.*,

¹⁶ Durrani *et al.*, 2018.

¹⁷ The 2016 formative research study was commissioned by DFID to provide an in-depth description and analysis of how TDP's teacher in-service training activities had been implemented by that stage.

2016). The impact evaluation did not collect data on training attendance but based on TDP's records, teacher attendance for the first 11 cluster training sessions was 80% or above. However, attendance declined substantially for the third and fourth sessions in Zamfara due to election-related issues, when some teachers were transferred to other schools, meaning that they could not form training clusters within the TDP schools. There was also a temporary decline in teacher attendance in Katsina for some sessions held during the holidays. Meanwhile, teacher attendance in Jigawa was largely steady for all 11 cluster training sessions (TDP, 2016). Data on whether the same teachers missed all or most of the cluster training sessions, or whether different teachers missed one or two sessions is not available. Regardless, there is a group of teachers that received only part of the intended training, which will affect the knowledge and skills acquired from it and the ability to effectively use them in the classroom.

The teacher in-service training modules covered pedagogy, including classroom management and the use of teaching aids, as well as English, mathematics and science content (see Table 3.1). This is reflected in the treatment teachers who attended the training reporting, what the most common contents were: teaching methods (75%); English literacy (54%); numeracy (52%); development of instructional materials (42%); inclusive teaching (33%); science (29%); and assessment of pupil learning (25%). Only 13% reported that the training covered use of audio-visual material during lessons, although this would be important for the use of TDP's audio clips in the classroom, for example.

3.4.4 Strengths and weaknesses of the TDP in-service cluster training

The evaluation baseline research in 2015 clearly identified the challenge of low English skills among teachers as an issue when it comes to comprehension within the cluster training. From the cluster training observations conducted during the formative study in 2016, language posed a barrier to participation and learning during training. Six out of the nine cluster training sessions observed used English as the main language of instruction, while in the remainder, TFs frequently reverted to Hausa. Group discussions were mainly in Hausa in all cluster training sessions observed. While the majority of teachers say they understand the content of cluster training sessions due to the mixture of English and Hausa used, TFs and TDTs report that teachers often struggle to follow when instructions are in English. Teachers from all schools suggest shifting the main language of instruction to Hausa to allow for fuller understanding and equal participation.

The formative study conducted in 2016 (Doyle *et al.*, 2016) found that attitudes and perceptions towards cluster training sessions are generally positive, and administrative and logistical aspects mostly run smoothly.¹⁸ The endline research finds that treatment teachers and head teachers who attended the TDP training found it very useful. The main benefits according to the training participants are consistent with the training content. The most important benefits according to the teachers are: teaching methods (82%); classroom management (55%); lesson planning skills (46%); subject knowledge (45%); development of instructional materials (44%); and inclusive teaching methods (38%). Overall, 20% of teachers reported that the training had increased their confidence in their teaching.

Just over half of the teachers (53%) reported they did not find any difficulties with the training. The main difficulties cited by 25% of the teachers who attended the training were non-payment of allowances, or that when allowances were paid, there were long delays, and lack of food or insufficient food provided at the training. Another 12% said the training took up too much time. The qualitative findings indicate that, across the three states (similar to the findings during the 2016 formative study), teachers were not happy with the food provided, or the food allowance, and they were rarely paid their allowances on time. This has negatively affected their experience of the training given that many teachers incurred costs to attend the training. According to teachers, head teachers, and TFs, this lowered attendance.

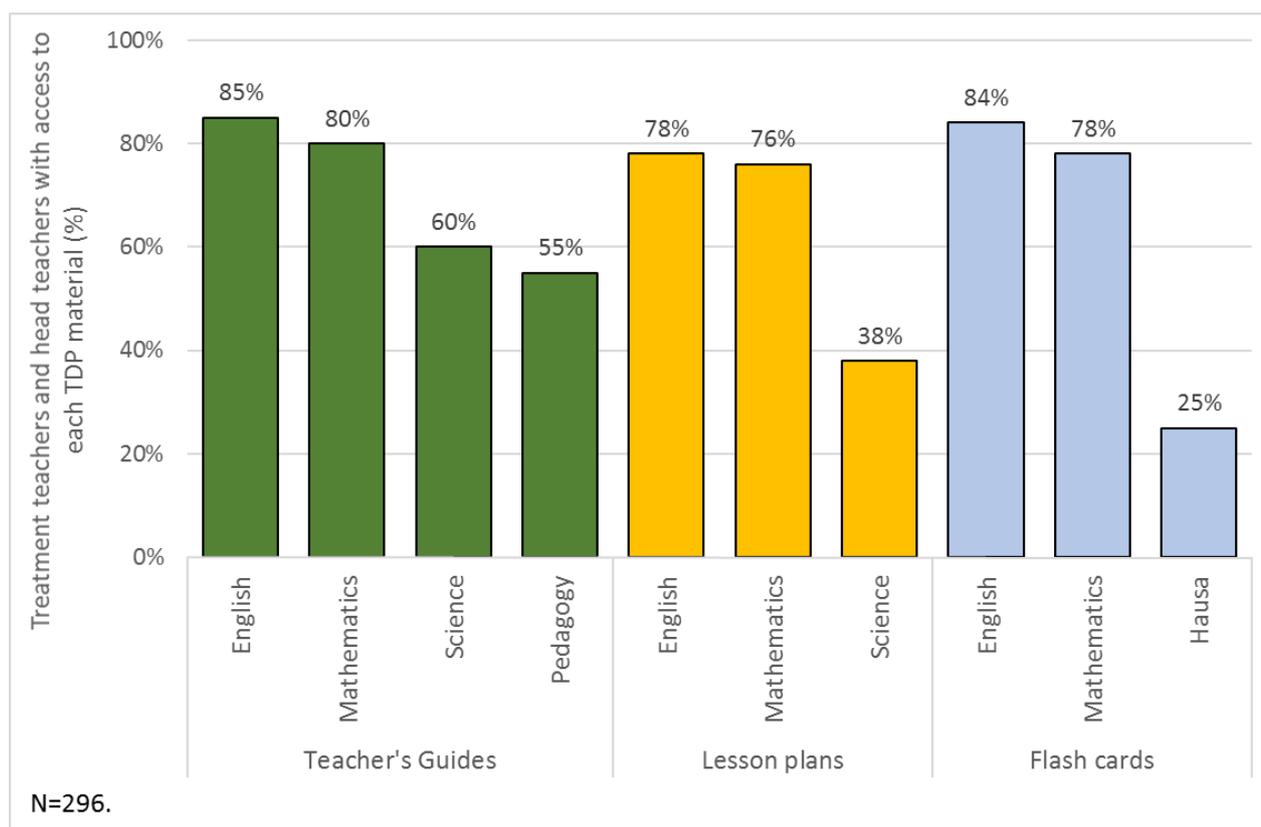
¹⁸ The formative research focused more on the practicalities of the implementation of the cluster training sessions.

3.5 Findings on the development and distribution of TDP materials and technology

TDP has developed and distributed a range of print materials to teachers, alongside the Trainer in the Pocket and audio-visual materials, for use in the classroom. Treatment teachers' and head teachers' access to the various printed TDP materials differ but is overall quite high, and most teachers have received the Trainer in the Pocket. But when it comes to the TDP amplifiers to be used in the classroom to play audio materials, there are problems in terms of their functionality and maintenance. There were also substantial delays in developing and distributing printed materials (Durrani *et al.*, 2018).

The vast majority of teachers and head teachers report they have access to at least one TDP Teacher's Guide (93%) (Figure 3.2). More specifically, access to the English Guide (85%) and Mathematics Guide (80%) is most common, while fewer teachers have access to the Science and Technology Guide (60%) or the Pedagogy Guide (55%). Just over half of teachers (55%) report having access to the TDP Reading Assessment Guide. Access to TDP lesson plans and flashcards varies by subject; 78% and 76% of teachers have access to lesson plans in English and mathematics, respectively, but only 38% to a lesson plan in science and technology. When it comes to flashcards, it is most common to have access to flashcards in English/literacy (84%), followed by mathematics/numeracy (78%), and then Hausa (25%).

Figure 3.2 TDP trained teacher and head teacher access to TDP print materials



Essentially, all the treatment teachers and head teachers who have access to them consider the TDP teachers' guides, Reading Assessment Guide, lesson plans, and flashcards useful, and use them both to prepare their lesson and during lessons when teaching. The latter may be an indication of teachers' low pedagogical skills (also see Chapter 6).

In qualitative interviews with teachers, it was clear that teachers understand the use of TDP's materials both inside and outside the classroom. Teachers reported finding the lessons plans useful in preparing their lessons and using TDP flashcards and posters when these are relevant. Despite general enthusiasm for the

materials, the classroom observations suggest that materials are only used in some classes (also see Chapter 6). In cases where TDP materials were not related to the lesson topic, many teachers said that they were now able to improvise and use low-cost or no-cost materials to ensure that materials were part of the lesson. However, materials are generally stored outside the classroom, generally in the head teacher's office, which may pose challenges for accessing and using materials.

There were delays in developing and printing some materials in time for them to be distributed at the relevant TDP cluster training sessions. Delays in material distribution also affected the head teacher manuals for the school management and leadership training. The timeframe for developing the TDP materials at the start of the programme was expected to be six months, but later this was revised to two years. However, materials were still being developed and distributed three years after TDP began. To mitigate these delays, photocopied versions of some materials were used as a temporary solution at cluster training sessions (Durrani *et al.*, 2018).

The endline research did not identify any changes in the national curricula or other parts of the primary education system since baseline that would affect the relevance of the materials developed by TDP.

Most of the treatment teachers have access to TDP audio-visual materials for self-study and to use with pupils in the classroom. Specifically, 93% have access to the TDP videos on teaching methods and 93% to the audio materials to use in the classroom.

In the qualitative interviews, most teachers and head teachers noted they found the TDP audio-visual teaching aids, such as the videos, phone and amplifier, to be useful inside the classroom. However, the qualitative research team did not observe any teachers use these materials during the lesson observations, and in quantitative observations, only three out of the 247 treatment teachers observed while teaching used audio.

Although most of the treatment schools (93%) report receiving amplifiers from TDP, less than half of these (48%) are reported to be working at endline. This will prevent teachers from using the TDP audio materials intended for use in the classroom. The main reasons for the TDP amplifiers not functioning are the they cannot be charged (71% of schools) and that they are faulty (25% of schools).

Cohort 1A teachers were intended to receive a mobile phone each from TDP. The treatment teachers are part of Cohort 1A and nearly all of them (98%) report receiving a TDP mobile phone, and 82% were given a TDP SD card. For teachers who were given both a mobile phone and SD card, these worked together in nearly all cases (98%), suggesting that lack of hardware compatibility did not create a barrier to teachers using the Trainer in the Pocket.

3.6 Findings on the implementation of TDP teacher support through school support visits

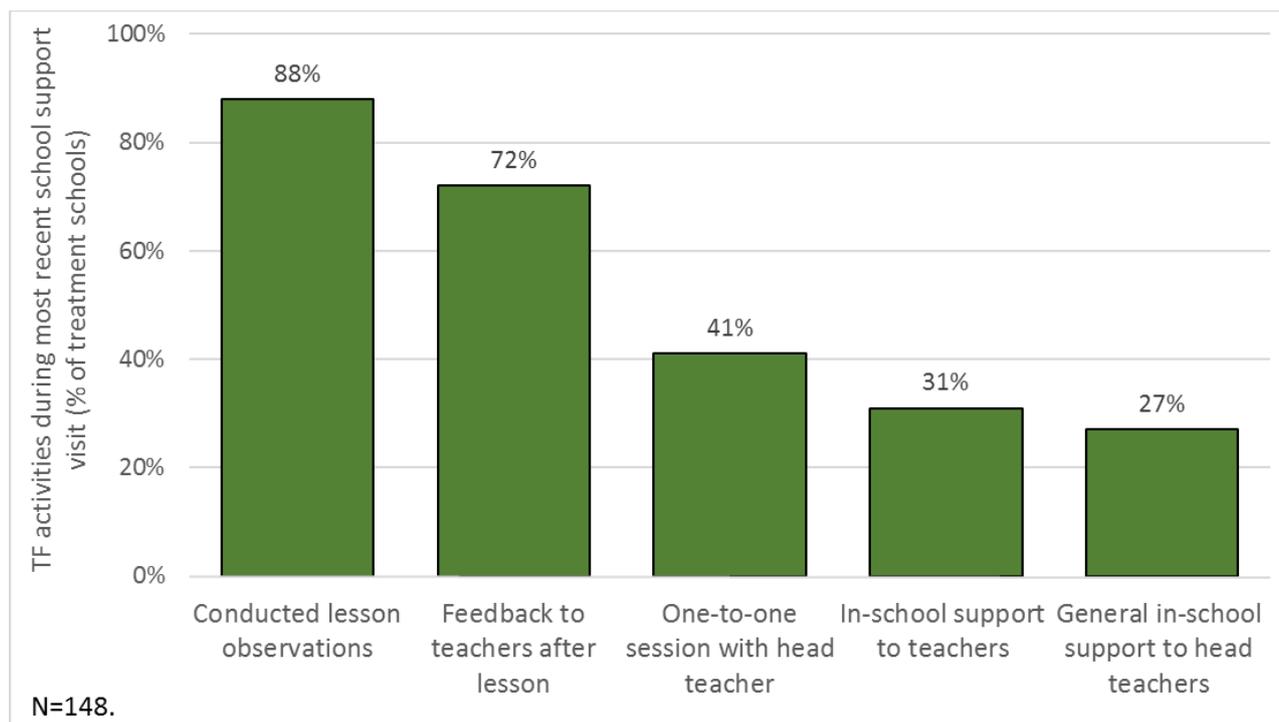
To ensure continuous school-based support to teachers, two school support visits per term are expected (see Section 5.4). The majority of the treatment schools received two or more school support visits last term, while a small group received only one visit.

There is, however, a large difference for the three states. While 74% of head teachers in Zamfara report that their school received a school support visit last term, only 53% in Katsina and 54% in Jigawa do. But among the schools that did receive at least one visit last term, schools in Jigawa and Katsina received on average more visits per term than schools in Zamfara. Thus, school support visits tend to be fewer but spread across a larger number of schools in Zamfara, whereas in Jigawa and Katsina, a larger proportion of schools did not receive any visits last term, but those that did received a larger number of visits. In Katsina,

TFs explained that some schools are difficult and expensive to access, and their allowances are insufficient given the cost of travel and accommodation when going to remote LGAs or travelling to Katsina town.

Based on head teachers' reporting, during most of the school support visits, TFs conducted lesson observations (88%) and provided feedback to teachers after the observations (72%). In 41% of the treatment schools, the TF held a one-to-one session with the head teacher. In many cases, the TFs also provided general in-school support to head teachers (27%) and in-school support to teachers (31%). Only in 8% of schools did the TF meet with the SBMC during the most recent visit. These findings are similar when instead teachers report on what the TF did during the last school support visit.

Figure 3.3. TF activities during the most recent school support visit



Some teachers and head teachers perceived the school support visit as a check on teacher attendance and compliance by 'check[ing] if we are implementing the trainings' (teacher, Jigawa), while others noted that the purpose of the visit was for TFs to provide feedback and support. Across the states and schools, teachers reported finding the school support visits encouraging and useful, in terms of correcting their pedagogy. Head teachers and TDTs felt that the visits were an essential part of ensuring that teachers were applying the techniques they learned and that these visits were crucial in facilitating change in the classroom (see Chapter 5).

TDTs and TFs received tablets to capture data during school support visits. Despite a change of software (from Tangerine to KoboCollect), some TFs continued to have problems with the software or hardware in 2017.

TDP was scheduled to help teachers set up and run English Reading Clubs the third quarter of 2017, in order to improve their English language skills. At the time of the endline quantitative survey in October–November 2017, 12% of the treatment teachers reported they had attended at least one such meeting between September 2016 and August 2017, which is very low. The reason for this is not known.

3.7 Findings on the implementation of the TDP leadership and management training for head teachers

3.7.1 Coverage and content of the leadership and management training

All head teachers in the TDP treatment schools are expected to receive the in-service leadership and management training. By endline, around 90% of head teachers had received some leadership and management training from TDP. Most of the remaining 10% were head teachers who had started in their current posts after 2014. Head teacher turnover is extremely high (see Chapter 5) and beyond the control of TDP; and is likely to undermine any impact of training on school leadership and management.

Of those trained, 91% had received the head teacher handbook. All of the head teachers who had the handbook found it useful. The main content of the training as identified by participating head teachers were school leadership and the role of the head teacher (88%); academic leadership (62%); record-keeping, reporting and information systems (54%); teacher management (52%); school development planning (47%); and teacher mentoring (40%).

3.7.2 Perceptions of the TDP leadership and management training

Virtually all head teachers considered the leadership and management training very useful (99%). The main gains from the training according to head teachers were school leadership (81%); teacher management (73%); academic leadership (69%); and confidence in their role as a head teacher (59%). Among the head teachers, 15% also reported gaining a support network. While 70% of the head teachers did not find any difficulties with the training, 18% identified a lack of allowances, long delays in allowances being paid, and food not being provided or not enough of it at the training sessions, as problems. Perceptions of change in school leadership and management are considered in more detail in Chapter 5.

3.8 Summary

Table 3.3 summarises the key evaluation questions and assumptions in the TDP evaluation framework that are addressed in this chapter, along with an assessment of whether assumptions are satisfied and the strength of the evidence. TDP has trained a large number of teachers and head teachers, and provided improved teacher materials that are seen as useful by respondents. However, some factors have hindered TDP from achieving its outcomes: teachers may not have the basic language and subject knowledge to absorb the new knowledge and skills; materials have not always been available on time; and teachers have not always been able to access and use the new audio-visual materials.

Table 3.3: Summary of evaluation questions and evidence for them

Evaluation question / assumption	Assumption satisfied	Evidence strength
Has TDP trained teachers and head teachers and improved teacher materials (effectiveness)?		
Percentage change in number of teachers receiving in-service training and training attendance (Effe-7/Effe-22).	Yes	Strong
Perceptions of usefulness of TDP materials (Effe-9).	Yes	Strong
Percentage change in number of head teachers receiving in-service training on school leadership and management (Effe-11).	Yes	Strong
What factors have facilitated or hindered TDP's achievement of its outcomes?		
Teachers have the basic language, subject, and pedagogical skills to absorb the new knowledge and skills available from TDP (Effe-25).	No	Strong
TDP materials are available to teachers (Effe-12).	Mixed	Strong
Teachers can access and use the TDP audio-visual materials (Effe-23).	No	Strong
There are no changes to the curriculum or other features of the education system that render the TDP materials redundant (Effe-27).	Yes	Moderate

Abbreviations (Effe-22 etc.) refer to questions or assumptions listed in the evaluation framework; see Volume II, Annex A.

4 Context for TDP

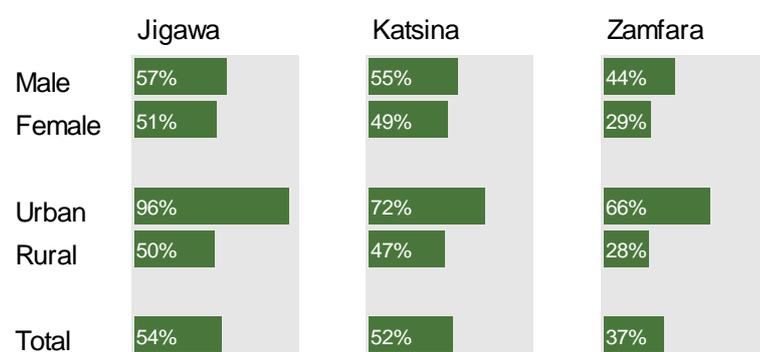
This chapter describes the context in which TDP operates, examines assumptions underlying the programme theory of change, and identifies factors that may influence the achievement of its intended outcomes of strengthened head teacher leadership and management, increased teacher effectiveness, and improved pupil learning. Some of these factors are within the control of TDP, while others such as pupils' home environment and teacher turnover, although largely beyond the scope of influence of the programme, need to be taken into account for programme design and when assessing programme sustainability (see Chapter 8).

The chapter begins by providing an overview of the education systems in the three states, followed by findings on community support and approach to education. It then discusses pupils' background characteristics and home environment. Next, findings on teachers' characteristics, class readiness, and turnover are presented. Finally, the teaching and learning environment, including school infrastructure, classroom conditions, and language of instruction, are examined.

4.1 States: Overview of the three education systems

There are approximately 2,100 public primary schools in Jigawa, 2,400 in Katsina, and 1,600 in Zamfara.¹⁹ According to household data, only around half of children of primary school age in Jigawa and Katsina, and under 40% in Zamfara, attend school (Figure 4.1). Attendance rates are particularly low in rural areas and lower for girls than for boys.

Figure 4.1: Adjusted net attendance rate, by state, gender, and location



Source: Authors' calculations based on National Education Data Survey (NEDS) 2015 data. The adjusted net attendance rate is the proportion of children of primary school age who attended either primary or secondary school at any time during the current school year.

The Nigerian education system is decentralised under a federal structure, and public education is the joint responsibility of federal, state, and local government. Education policy at the federal level has been guided by the Federal Ministry of Education's 10-year Strategic Plan, which was published in 2007 (Humphreys and Crawford, 2015). Universal Basic Education, a policy initiative aiming to provide free and compulsory primary education and junior secondary education, was launched in 1999; UBEC was formed in 2004 as the national agency in charge of disbursement of federal intervention funds for education. SUBEBs are responsible for the delivery and management of primary and junior secondary education at the state level.

Jigawa, Katsina, and Zamfara are among the most educationally disadvantaged states in Nigeria. All three have a low rate of adult literacy, a high proportion of parents who have never been to school, and a high proportion of out-of-school children at primary and junior secondary level. Within each state there are

¹⁹ Data from the 2016/17 annual school censuses.

stark differences in school attendance and learning outcomes according to rural/urban location, and attendance rates are lower among girls than boys. Zamfara has particularly large gender disparities, with gross enrolment rates at primary level of 88% for boys and 41% for girls (ZMOE, 2015).

Many schools have high pupil–teacher and pupil–classroom ratios; for example in Zamfara the pupil–classroom ratio was reported to be 63:1 (ZMOE, 2015); the pupil–teacher ratio is reportedly 71:1 in Katsina (Katsina Ministry of Education, 2010) and 41:1 in Jigawa (Jigawa Ministry of Education, Science and Technology, 2014).

It is difficult to obtain comparable data on education expenditure, but education sector strategic plans suggest that total government expenditure on education was NGN28 billion, or 29% of the state budget, in Jigawa in 2012, of which NGN4.8 billion was allocated to primary schools (Jigawa Ministry of Education, Science and Technology, 2014). In Katsina in 2010, government expenditure on education was NGN19 billion, or 23.5% of the state budget, of which NGN9 billion went on basic (primary plus junior secondary) education (Katsina Ministry of Education, 2010). However, in both Jigawa and Zamfara sector plans, it was noted that much of the money allocated to education was not actually released. For example, in Zamfara in 2013, NGN7.6 billion was allocated for capital projects in education, but only 10% of this was released (ZMOE, 2015). Regardless of the amounts allocated, states appear to have difficulty providing sufficient funds to address issues such as poor infrastructure, teacher recruitment, and teacher salary payments.

There are a number of problems around teacher management, recruitment, and deployment in the three states (Steenbergen, 2016; Kontagora *et al.*, 2017). Teacher recruitment varies somewhat by state but is generally decided by state and local governments. Head teachers have little say in deployment, and little power to dismiss or sanction teachers. States and local government rarely appear to map and address schools' staffing needs, there are no clear and transparent procedures in place for posting teachers, and few candidates for teaching posts have the required skills in English, mathematics, and science (Kontagora *et al.*, 2017). There is a large shortage of teachers in Zamfara's primary schools, which has worsened in recent years (Rai *et al.*, 2017). Recruitment of teachers relies almost entirely on federal government allocations to LGAs, which effectively puts a cap on the total number of new recruits (Steenbergen and Hill, 2016). Teacher training colleges depend heavily on the tuition fees paid by their students, and so have incentives to admit too many students, including some whose prior educational qualifications are insufficient (*ibid.*).

4.2 Community: approach and support to education

In order to understand the challenges for education in Jigawa, Katsina, and Zamfara, it is important to understand local attitudes, practices, beliefs, and economic conditions. Most schools visited by the qualitative research team can be classified as semi-urban or rural schools situated in or outside smaller towns or villages in small-holder farming communities, where parental income is based on the sales of cash-crops, or excess produce of subsistence farming.²⁰ On Fridays, schools are less frequented or close early, as the Friday prayer is observed by the communities. Equally, traditional gatherings and family ceremonies are deemed important and traditional values and beliefs honoured.

4.2.1 Community perceptions of education

Communities in Jigawa, Katsina, and Zamfara have, in the past, reportedly been sceptical about the value and relevance of Western education. 'When I first came to this town, members of the community got irritated with [the] mere mention of Western education, unlike the school I left before coming to this school, which is located in the city' (SBMC member, Zamfara). Rural schools seem to be affected by adverse attitudes towards Western education more than schools in urban areas. Especially in Katsina and Zamfara,

²⁰ With one school per state being located in an urban area (Volume II, Chapter 2).

parents are inclined to send their children to religious schools. While the two education systems compete, they are not always mutually exclusive. Teachers in Katsina suggest some pupils attend both government and Quranic schools, which affects pupils' punctuality, but not their attendance.

In numerous conversations across the three states, head teachers, teachers, and SBMC members emphasised the differences between urban and rural communities and their effects on the relevance and role of education. In particular, the economic well-being of the community also seems to influence the value placed on western education. For example, the absence of economic opportunities in rural environments may explain lower attendance and less favourable attitudes towards education. A teacher explains:

[F]or among them are those who were fortunate to pursue their education and are now graduates and yet they are left jobless and therefore have decided to keep their children to farming [...] to them it's better, they take them to Almajiri [Quranic] schools. (Teacher, Zamfara)

By contrast, if the school is located in a more developed environment, the connection between education and opportunity for the children is more evident:

The [...] rate of small businesses' [growth] in society is the reason why there is a change in education; people realised for you to be able to do so many things here and that sometimes education is required. (SBMC member, Katsina)²¹

In rural contexts, parents are assumed to be less capable of assessing the progress of their children in school, as they are illiterate, semi-literate, or have very basic knowledge of mathematics, English and science. Further, evidence from schools across all three states suggest that parents rely on observable factors, such as school materials and the state of the school buildings, as markers of the quality of education. A teacher in Zamfara explains:

[A]nd when you complain [about the children being withdrawn from school] they tell you that they haven't seen any benefit of the schooling. A conducive environment is a major factor in teaching and learning process which we lack here in our school and the parents have realised it. Therefore most times they decide to allow their children to stay back [home]. (Teacher, Zamfara)

In Zamfara, even when children are enrolled and sent to school for a few days, teachers observe trickle-out of pupils: 'The problem is that even after enrolment they withdraw them gradually. This is our greatest challenge' (teacher, Zamfara). This in numerous instances is attributed to the shortage of teachers, the lack of materials, and/or the absence of visible progress in the child's learning. One of the pathways through which TDP has affected attendance and enrolment is through improving the markers for the value of Western education visible to the parents, for instance, through the provision of learning materials to the school.

Now with the advent of TDP and a lot of teaching materials that attract the pupils we go to the parents to enlighten them so that they send their kids to school even during the rainy season, but before we have problem of attendance. (Teacher, Zamfara)

There is evidence that the more households decide to send their children to government schools, the more parents will follow. This is one of the reasons why school uniforms are seen as important among head teachers, teachers, and SBMC members, as uniforms 'attract other parents to send their children to school' (SBMC member, Zamfara). (Also see Chapter 5 on the increase in schools providing uniforms free of charge.) While schools actively work towards an improved perception of the value of Western education,

²¹ The qualitative research did not include community leaders or parents outside the SBMCs to triangulate these observations.

this research emphasises that while a lot has been achieved, rural enrolment and regular attendance is still a challenge to the effective delivery of education.

4.2.2 The role of SBMCs

The Universal Basic Education reforms in Nigeria included measures to raise the accountability of schools to local communities, and in 2006 the government mandated that all primary schools must have an SBMC.²² The intended role of SBMCs is to contribute to the improvement of school management, education quality, and of relations between the school, community, and local government (EDOREN, 2016b). There is evidence for Nigeria that if provided with training and mentoring, SBMCs can be effective in raising community resources to improve school infrastructure, and to increase school participation and teacher attendance, but that this requires the active involvement of religious and traditional leaders (Dunne *et al.*, 2013; Pinnock, 2012).

In schools in all three states there appears to have been a gradual opening up of communities to Western education, which is also reflected in increasing enrolment rates. This is attributed to the engagement of SBMCs (see Chapter 5), and the resulting involvement of traditional and religious authorities, as well as local government in all three states.

Teachers in Katsina and Zamfara observe that the payment of teacher salaries, regardless of pupils' attendance, has signalled to parents that the government values education and has led them to do the same:

The government continues to pay salaries to the teachers and keeps campaigning [...] towards education, this makes it easier for the parents to realise it's better to enrol their children, since the teachers and the government have nothing to lose, it's the parents and the society that are losing [out]. (Teacher, Katsina)

This said, SBMCs are facing challenges in obtaining resources from the local government education authority (LGEA) and/or state to fund the activities in their school development plans. Furthermore, the degree to which SBMCs can be effective in raising school accountability and quality is debatable as they do not have any formal power to impose sanctions on schools or teachers, and even if they did, teacher and resource allocations are not determined at school level (EDOREN, 2016).

4.3 Pupils: characteristics and home environment

Pupils' learning levels are not influenced only by what happens in school but also by their community and home environments. The impact evaluation's qualitative and quantitative research collected data on several aspects, such as pupils' attendance and prolonged absences and the underlying reasons for these; pupils' poverty status and education support at home; and pupils' familiarity with the language of instruction (Bashir *et al.*, 2018; De *et al.*, 2016b).

4.3.1 Demographics

In Nigeria, the official school entry age is six but it is common for pupils to start school when they are older, although there has been a reduction in the proportion of over-age pupils in the three states since 2003 (EDOREN, 2016a). Among the pupils in the quantitative sample, most are of appropriate age for Primary 6 (11–12 years) but around one-fifth are under-age (9–10 years) and one-fifth over-age (13–17 years).

²² The SBMC members include the head teacher; teacher, pupil, and parent representatives; and religious and traditional leaders.

In the quantitative sample schools, 41% of the Primary 6 pupils are girls, which is similar to the situation at baseline. This is consistent with evidence at national level that more girls than boys are out of school (UNICEF, 2017; EDOREN, 2016a).²³ One reason is that Western education is perceived to interfere with the traditional understanding of a woman's role in the Hausa traditions and with the Islamic teaching, and is less relevant to preparing girls for their adult roles in their communities (Kazeem *et al.*, 2010).

Evidence in Katsina and Zamfara suggests that the burden of income-generating activities and household chores is placed on girls rather than on boys, which adversely affects their enrolment and attendance. According to a head teacher in Katsina, it is difficult to convince parents about the relevance of girls' education in the absence of female role models (see Section 4.4). SBMC members report using an example of a successful female graduate, now engaged in a polio vaccination programme, to lobby for girls' education. Girls are also more likely to be withdrawn from school in order to be married. This was only mentioned in Zamfara but is likely an issue in rural regions across the three states (Humphreys and Crawford, 2015).

Gradual improvements in girls' enrolment are suggested to have taken place across the three states. In Katsina, a UNICEF programme is aiming to increase the enrolment and attendance of girls by supporting families with financial incentives matching the foregone income of girls not working. SBMC members and teachers emphasised the positive effect of this programme on the enrolment and attendance of girls.

4.3.2 Socio-economic background

Poverty status is a key factor affecting whether children in Nigeria and in the three states are in school as well as pupil learning levels.²⁴ In Nigeria, the predicted probability of being out of school is 48% for the poorest 20% of children, compared to 21% for children from the richest 20%, and primary completion rates are much lower for poorer children (EDOREN, 2016a; UNESCO, 2014). For the northwest region, the predicted probability of being out of school for a child from the poorest 20% is much higher than nationally at 68% (EDOREN, 2016a).

The quantitative survey collected data to capture pupils' socio-economic status and differences in pupils' home environments in terms of assets and access to sanitation. Around 90% of pupils said that someone in their household owned a mobile phone, 84% a radio, and 12% a computer; 21% of pupils had a flush toilet at home, with most of the rest using pit latrines.

In the quantitative sample, the average family size is 12–13 persons, and on average, five household members are younger than 15. This places an additional economic burden on households, especially poorer ones, which need to buy textbooks, school supplies, and uniforms for their children; this may lead to not all children being sent to school.²⁵

4.3.3 Pupil absenteeism

Pupils who attend school appear to do so fairly regularly, according to responses to the National Education Data Survey (NEDS) for Jigawa, Katsina, and Zamfara as a whole. In that survey, primary pupils had missed around two days in the past four weeks. Boys miss slightly more school than girls: on average, boys missed

²³ Nationally, 34% of girls and 30% of boys are out of school, and these proportions are large in the states. Out-of-school children are defined as the number of children of primary school age who are not enrolled in primary or secondary school, expressed as a percentage of the population of primary school age. The predicted probability of being out of school in Nigeria is 32–35% for girls compared with 28–30% for boys (EDOREN, 2016).

²⁴ The predicted probability of being out of school is 68% for the poorest 20% of children in the northwest region of Nigeria.

²⁵ Family is defined as the people the pupil normally shares food with and who consider the same person the head of the household.

10% of days when the school was open, while girls missed 8%;²⁶ 24% of boys, and 21% of girls, had missed more than one day in the past four weeks. Most pupils reportedly spent close to a full school day in school: three-quarters of pupils had spent five hours or more in school during the last school day. On average, boys and girls spent similar amounts of time in school each day, although in Zamfara state girls spent significantly less time in school than boys.²⁷

Teachers and head teachers in this evaluation, however, stress pupils' absence from school and irregular attendance as a major issue for learning. The reasons they give for absence from school are varied but often related to the pupils' home environment. Children are frequently required to support their families, by rearing or herding livestock, or helping with the harvest of groundnuts, rice and guinea corn. Since agricultural activities generate cyclical bulk payments, children are often tasked to supplement day-to-day household income, by hawking fruit, cola nuts, or selling water. In a few cases the money earned before school is used by pupils to purchase food. Evidence from the qualitative research suggests that, in lower-income contexts, it seems more difficult for parents to trade the immediate income losses of support with farming, or hawking, against the potential future gains of their children acquiring literacy and numeracy skills.

Across all three states, agricultural seasons strongly affect the attendance of the pupils.²⁸ In Zamfara, this explains the absence of pupils observed during the qualitative research with only six pupils gathered by the head master in one school and 28 of 50 pupils in attendance at another school. This poses a stark contrast to the frequent accounts of overcrowded classes: 'But by the month of March when the season is over, the school will be overcrowded with children because there is no work to be done on the farm' (teacher, Zamfara).

While the harvesting period keeps pupils out of the school for a longer period of time, teachers also report frequent absences for shorter periods of time. This habitual absence is reported to be driven by several factors: some pupils do not like coming to school given the condition of the buildings and lack of materials; pupils might be occupied with household chores or economic activities; or parents do not allow them to enter the classrooms based on safety concerns. Another reason is parents' inability to pay for indirect costs of schooling, which is singled out as a factor impeding enrolment in rural schools across all three states. A head teacher in Katsina suggests that a number of parents do not enrol their children due to financial constraints. A lack of uniform and writing materials is perceived as shameful by some parents. This was confirmed across schools in all states.

Sometimes it is pretty difficult for parents to provide book[s], pens and uniform for the pupils [...] some people in the community would tell you they are willing to send their children to school but unfortunately they don't have the means to provide uniform and other learning materials. (Teacher, Katsina)

Respondents noted, and the qualitative research team observed, that many pupils return home during the morning break, usually to eat, but that often pupils did not return to school after the break resulting in high pupil absenteeism after the morning break. In order to ensure that pupils return after break, a Katsina school kept pupils' bags while they went home to eat.

²⁶ Authors' analysis of the NEDS household survey. NEDS was conducted in May to early August 2015, so schools should have been open.

²⁷ Authors' analysis of the NEDS household survey, based on questions about when pupils arrived at school and when they left the school during the last school day. Asked in a separate question how many hours their children spent at school, most responded that they only spent two hours at school, and only 2% said they spent five hours or more. The questions based on times that the child arrived and left were taken to be more accurate, however.

²⁸ NEDS was conducted at a different time of year to the qualitative research, which helps explain differences in absenteeism.

Absenteeism affects the quality of learning as pupils struggle to catch up with the content of the lessons and teachers have to ensure they are not left behind. Pupils are expected to move from one class to the other at the end of the term, as it is uncommon for pupils to repeat a year.²⁹ These various forms of absence impede pupils' learning, and also adversely affect the quality of teaching, which may lower teacher motivation (see Chapter 6).

Although these factors may be important for pupil absenteeism, it should also be noted that there were frequently insufficient teachers to teach all classes, and teachers were sometimes not present and teaching in classrooms (see Chapter 6). It is possible that teacher absence is among the reasons pupils do not attend, although this was not raised by any of the participants in this study.

4.3.4 Nutrition

Adequate nutrition is essential for pupils to be able to learn. The quantitative research suggests that cases of children not eating at all are relatively rare, with over 90% of pupils reporting having eaten before coming to school and most having something to eat during the morning long break, but the study did not ask about the quantity or type of food consumed, which may be insufficient for some. The qualitative research finds several accounts of pupils coming to school hungry, which was felt by participants to hinder their ability to learn (SBMC member, Jigawa) and sometimes was associated with them going home during morning break and not coming back afterwards (see above), although it does not seem to deter pupils from attending classes once in school (teacher, Katsina).

There are school-feeding programmes in parts of Jigawa and in Zamfara, and teachers and SBMC members emphasised their effect on pupils' ability to learn. The school-feeding programme in Zamfara – and in some schools in Jigawa – is reported to draw pupils to school, even if only for the period of the lunch break: '[A] lot of them just come for the food. After they eat food, they leave school and go home' (pupil, Zamfara). An additional positive effect of the school-feeding programme seems to be that teachers also eat in school. In Zamfara, teachers report not being able to eat every day due to their low salaries. In these cases, school-feeding is beneficial both to teachers and pupils.

4.3.5 Education support at home

Typically, pupils who live in homes with reading materials available and whose parents have attended school and can read and write, tend to receive more study support at home, which benefits their learning. Among the pupils in the quantitative sample most reported living in homes where there were three or more books (around 80%), that their fathers had attended school (around 87%), that their mothers had attended school (around 70%), and that their parents could write (Figure 4.2). These levels are surprisingly high compared to other surveys in the north-western region and suggest that there may have been some misreporting or misunderstanding among the child respondents. Household survey data suggest that, among children who are in primary school in Jigawa, Katsina, and Zamfara, only around half of fathers and one-quarter of mothers ever attended school themselves.³⁰ The household survey found that only 5% of adults could read a simple sentence in English, while only 15% could read a simple sentence in Hausa.³¹ This evaluation's qualitative research did not focus on pupils' home environment, but participants' perceptions appeared to be in line with the picture suggested by the household survey results. Several responses

²⁹ The government's official policy is to promote 100% of pupils (Rai et al., 2017).

³⁰ Authors' analysis of NEDS 2015 data.

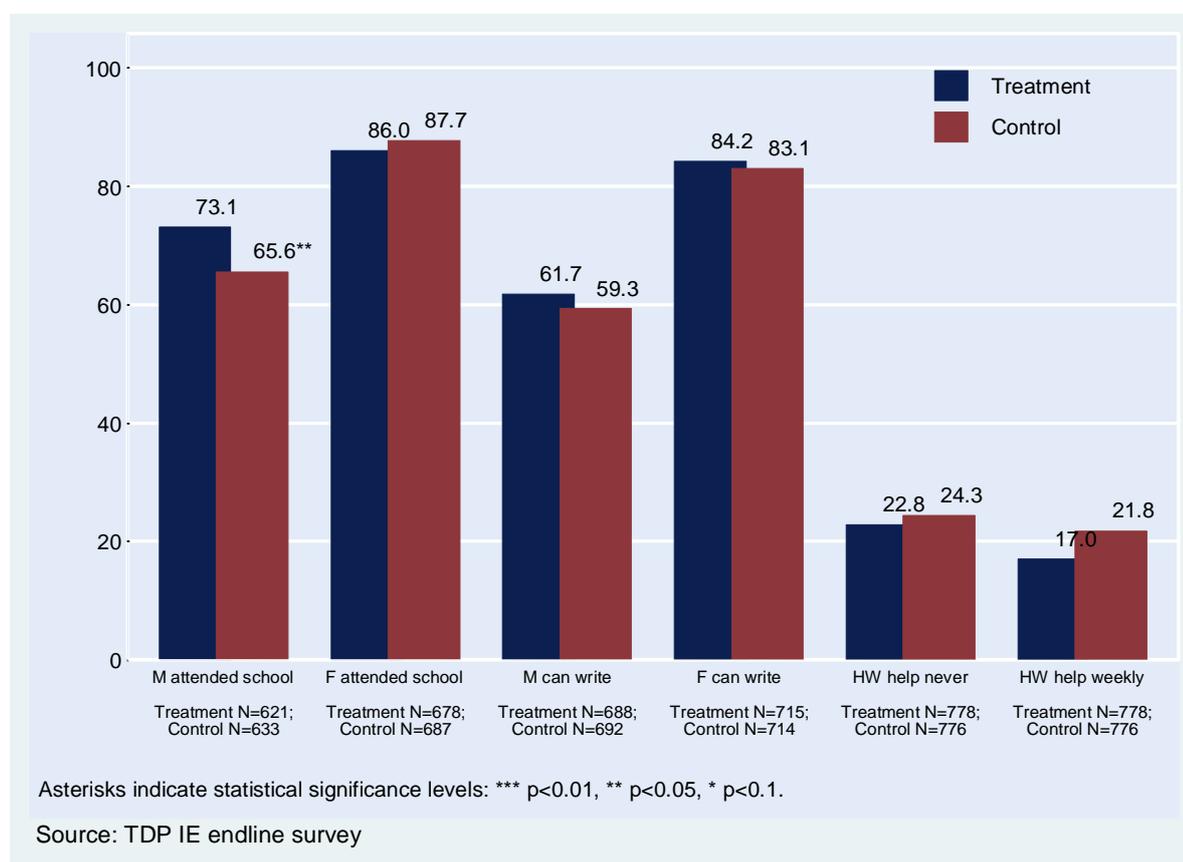
³¹ Authors' analysis of NEDS 2015 data. The figure on reading in Hausa is for those who selected Hausa as their preferred language (from a choice of Hausa, Yoruba, Igbo, and Arabic). Among those who selected Arabic, the proportion who could read some or all of the sentence was 8%.

suggested that parental education levels, especially of mothers, are low, households lack reading materials, and many children do not eat before school.

These differences in parents' schooling may influence the level of direct study support pupils receive at home. About 23–24% of pupils in the quantitative sample report never receiving help with their homework at home, and 17–22% of pupils receive homework help more than once a week. The pupils whose mothers and fathers have attended primary school and/or can write are significantly more likely to receive help with homework on a weekly basis than pupils whose mothers and fathers cannot write.³²

Again, however, the results from interviews with parents in the 2015 NEDS household survey suggest that far fewer pupils are doing homework, and receiving help with it, than was reported by pupils within this evaluation. In NEDS, only 14% of primary pupils in Jigawa, 15% in Katsina, and 10% in Zamfara were reported by their parents or guardians ever to do homework, with little difference between boys and girls. Only 6–7% reported that someone helped the child with his or her homework in Katsina and Jigawa, and in Zamfara only 3% did.³³ It may be that pupils interviewed in the school for this evaluation were reluctant to admit to not doing homework, or not having help with it.

Figure 4.2: Parental education and help with homework at home at endline



4.4 Teachers: characteristics and class readiness

Teachers' characteristics, knowledge, and skills influence the extent to which they benefit from the TDP in-service teacher training and their ability to be effective in the classroom. The impact of the TDP in-service training on teacher effectiveness may also be affected by features of the education system, such as a high

³² This is based on simple bivariate regressions that do not control for any other factors that may influence whether pupils receive help with homework at home.

³³ Authors' analysis of NEDS 2015 data.

teacher turnover, large class sizes, and a mismatch between the language of instruction and pupils' home language. The endline research collected data on selected teacher characteristics, subject knowledge, pedagogical skills, teacher turnover and transfers, and the school and learning environment. The quantitative findings in this section are for teachers and head teachers who teach primary classes and who were at the same school both at baseline and endline.

4.4.1 Characteristics of teachers and head teachers who teach

In the northwest region the vast majority of primary teachers are male. In Jigawa, for instance, only 12% of primary teachers are female, which is a much smaller proportion compared to the national average of 48% (Doyle, 2017; UNESCO, 2014). This teacher gender gap is even more pronounced in rural areas, for example in Zamfara, where only 5% of teachers in rural areas are female (Rai *et al.*, 2017). This is reflected in the treatment group schools, where 16% of teachers are female. Female head teachers make up only 3% of the sample head teachers.

Pre-service training and teacher recruitment processes in the three states may not be rigorous enough to ensure that the teachers who end up in the classroom have the basic skills needed to teach effectively (Bennell *et al.*, 2015; Doyle, 2017; Rai *et al.*, 2017). Recruitment is dominated by LGAs and influenced by local political elites, resulting in recruitment of unqualified teachers (Steenbergen *et al.*, 2017). Under the National Policy on Education the minimum qualification to teach at the basic education level is the National Certificate in Education (NCE).³⁴ The proportion of sample teachers holding an NCE has increased by six percentage points since baseline, both in treatment and control schools. At endline, 73% meet this requirement.³⁵ Of the remaining 27%, almost all have less than an NCE qualification. This may be considered insufficient for teachers to fully benefit from the TDP in-service teacher training. Nonetheless, evidence from several states suggests that teachers' possession of an NCE does not necessarily mean they have the subject knowledge and pedagogical skills needed to teach effectively (EDOREN, 2016b).

At baseline, prior to the start of TDP, 51% of treatment and 55% of control group teachers had received some type of in-service teacher training in the previous two years. By the endline, 97% of treatment teachers and 74% of control teachers had received in-service teacher training in the preceding three years (for a discussion of contamination of the control group, see Chapter 2).

For teachers in treatment schools, the main training received is the TDP in-service teacher training (92%), followed by the TDP Reading Programme (56%), implemented in the first half of 2017 over a 14-week period to improve teachers' (and pupils') reading skills in English and Hausa; Jolly Phonics training to use synthetic phonics to teach literacy in the early grades (26%); and Education Sector Support Programme in Nigeria (ESSPIN) teacher training in Jigawa only (15%). In control schools, many teachers received SUBEB, Jolly Phonics, and ESSPIN training.

The sample teachers' subject knowledge levels in English, mathematics, and science and technology were extremely low at baseline (see Chapter 6). This meant that teachers found it difficult to understand the TDP knowledge aspects of the training sessions. In addition, because of their poor English skills, teachers struggled to follow the training sessions, which were mostly held in English (Doyle *et al.*, 2016). This potentially undermined teachers' ability to fully acquire the knowledge and skills taught in the TDP training.

The low levels of teacher subject knowledge in the three states were identified as a key issue by the impact evaluation's baseline research in 2014 and formative research in 2016 (De *et al.*, 2016a; Doyle *et al.*, 2016). In the first half of 2017, TDP tried to address this by implementing a Reading Programme aimed at improving teachers' (and pupils') reading skills in TDP schools. The endline quantitative survey found that

³⁴ Previously the requirement was the Grade II certificate.

³⁵ Since this is a panel of teachers and head teachers, this increase is due to additional teachers and head teachers acquiring the NCE since baseline.

56% of teachers and head teachers had received this training by October 2017. To help improve teachers' English literacy skills and language switching between English and Hausa, TDP planned to establish English Reading Clubs in July to September 2017 (Durrani *et al.*, 2018). At the time of the endline quantitative survey in October 2017, 12% of treatment teachers and head teachers reported they had participated in at least one English Reading Club meeting. TDP is also producing new materials, including Strengthening Teachers English Proficiency materials, designed to further address the low levels of English language proficiency among teachers (Durrani *et al.*, 2018).

4.4.2 Teacher turnover and reasons for it

In northern Nigeria, average teacher attrition was reportedly around 20% in 2012, with the majority leaving the teaching profession to find better working conditions (Garba, 2012, cited in Wushishi and Baba, 2016). In line with this, teacher turnover in the sample schools is high; 33% of treatment teachers and 49% of control teachers were no longer at the same schools by endline.³⁶ This is equivalent to about 11% of teachers in treatment schools leaving per year (and 16% of teachers in control schools). Teacher turnover since baseline is highest in Katsina (47%), followed by Jigawa (41%) and Zamfara (34%).³⁷

The proportion of treatment group teachers who were transferred in the last school year is 7% (the same for control teachers), which explains a large part of the turnover (this roughly averages 11% per year), but not the difference in turnover for treatment and control teachers. At baseline, teachers described that well connected head teachers could find a way to have a teacher transferred for personal reasons or in an attempt to settle a conflict between teachers (De *et al.*, 2016a). Retirement also contributes to turnover.³⁸ Among treatment teachers, 2% would have retired around the time of the endline, based on their age. Another main reason for teacher turnover is undertaking further studies (see Box 3).

Regardless of the reasons for the high teacher turnover, it will reduce the potential benefits of in-service training. Even if teachers trained by TDP are moved to other TDP schools, transfers are disruptive to the training model, which to a large extent relies on continuous, school-based peer learning.

Box 3: Reasons for teacher turnover from the validation phone survey

As part of the impact evaluation endline design phase, a validation phone survey was conducted to estimate head teacher, teacher, and pupil sample attrition rates (Cameron and Pettersson, 2017); 291 of the 330 baseline sample head teachers were reached. The most commonly reported reasons for sample teachers leaving the school during the three years since baseline were:

- transfer to another school (70%);
- going for further studies (15%); and
- retirement (7%).

Overall, this means that 70% of the teachers who left their school since baseline were still working in education at the time of the validation survey, while 30% had left teaching altogether, which will influence TDP impact.

³⁶ Between baseline and endline (three-year period). This difference is statistically significantly different at 1% level.

³⁷ There was a mass teacher transfer in Katsina in September 2017 just before the endline quantitative survey, where primary teachers with B.Ed. and M.Ed. qualifications were to be transferred to secondary schools. However, the proportion of sample teachers with either of these two qualifications is very small, meaning that either the mass transfer also included teachers with lower qualifications or there is another reason for turnover in Katsina being higher than in Jigawa and Zamfara. TDP requested the SUBEB not to transfer teachers from TDP schools, which includes treatment teachers (correspondence with the TDP management team of 29 August 2017).

³⁸ The official retirement age for teachers in Nigeria is 60 years, or following 35 years of service in some states (including Zamfara), whichever comes first.

4.5 Schools: infrastructure and the teaching and learning environment

Schools' size, infrastructure, and classroom conditions matter for the effectiveness of teachers and head teachers' leadership and management, and for pupil attendance and learning. For teachers, class size and teaching equipment and materials in classrooms, for example, determine which types of teaching practice can be used effectively (see Chapter 6). For head teachers, large schools with very large class sizes and inadequate infrastructure tend to present different leadership and management challenges than small schools with manageable class sizes and good infrastructure. School infrastructure and classroom conditions affect pupils' attendance as well as their learning experience when at the school. To identify critical school-level limitations, qualitative and quantitative research collected data on various aspects of school infrastructure and the teaching and learning environment.

4.5.1 School infrastructure

Access to basic sanitation and water

Among the sample schools, 23% do not have any toilets on the school grounds, and in schools that do have one or more toilets, on average 146 pupils share one toilet. UBEC sets a minimum standard of one toilet or latrine per forty pupils, separated by gender (UBEC, 2010).

Across states and schools, teachers have to leave schools to use the toilets of neighbouring houses. Sometimes toilet facilities are shared between boys and girls, or are not maintained, so that pupils do not want to use them. In most schools, toilet facilities lack doors, which raises concerns for the safety of primary school girls. This is a major problem that affects girls' attendance and poses a challenge for female teachers.

[T]here are toilets at the back here, which are so old they need to be renovated and the female teachers do not like to go there at all [...] they go to the neighbouring houses, especially [anonymised] house, all our morning and afternoon, female teachers go to her house. (Teacher, Katsina)

Moreover, only just over half of the sample schools have a source of drinking water, compared to 72% of schools nationally (UNESCO, 2017).³⁹ Older pupils are sent to fetch water from surrounding houses, or the head teacher buys water from street vendors for the pupils to drink. This might interrupt the teaching and potentially poses a risk for the health of pupils and teachers.

Availability of functional classrooms

In all but one of the schools visited by the qualitative research team, head teachers report the lack of functional classrooms to be a critical challenge. In the quantitative sample schools, the average number of classrooms in use is eight, and there are on average over 90 enrolled pupils per classroom in use. But there is substantial variation. In 10% of schools there are fewer than 42 pupils per classroom in use, while in the 10% of schools, at the other extreme, there are 155 or more pupils per classroom in use. This indicates that there is a severe classroom shortage in some schools, and head teachers and teachers at these schools are likely to face different constraints than those at smaller schools.

While some schools lack the space to build new classroom blocks, almost all schools have classrooms that cannot be used as they pose a safety hazard to teachers and pupils. Schools across all three states report a lack of functional classrooms, which leads to overcrowded classes and multi-grade teaching. In some cases, classroom blocks are used only in fair weather conditions. Missing roofs expose pupils and teachers to rain,

³⁹ This includes a tap, well, or other drinking water supply on the premises, but it is not clear if pupils or staff have to fetch buckets of water.

dust and sun, and cracked ceilings pose a safety threat. The ceiling in one school in Zamfara was held up by bamboo sticks.

Honestly in terms of infrastructure the school is getting worse, because once it is raining the children have to go home, once there is storm I run home because you can hear the wind shaking the building. There was a day a block nearly fell on me. (SBMC member, Jigawa)

Infrastructure plays a central role in the way in which pupils perceive their school and affects attendance. In some schools, pupils recognise dilapidated classrooms as a safety hazard. The ‘majority of the pupils don’t want to come to school, because they are scared of the cracks in the wall, that the building might fall one day’ (pupil, Zamfara).

Missing windows, doors, and locks pose a risk to furniture, classrooms, and teaching materials when schools close as homeless community members use the buildings to sleep in. Therefore, teaching materials cannot be kept in the classrooms, and posters and pictures have to be removed from walls when the teachers leave the school. Across all schools, the qualitative research team found the TDP posters and teaching materials to be stored in the head teacher’s office since this is often the one room in schools with a lock, or at home, to avoid theft.

4.5.2 The teaching and learning environment

The average school size at endline is recorded at 692 to 700 pupils. There are, however, large differences among the schools. In 10% of the treatment schools, there are 174 or fewer pupils, while in another 10% of treatment schools there are 1,600 pupils or more (this is similar for the control schools).

Pupil enrolment

There has been a notable rise in pupil enrolment since baseline. Treatment schools have increased significantly in size, from an average of 640 pupils to 700.⁴⁰ Pupil enrolment has also increased in control schools but this change is smaller and not significant. Examining average enrolment by state shows that it increased the most in Jigawa, followed by Katsina, but actually declined in Zamfara.

According to an SBMC member in Katsina, ‘the most important positive change is the increase in [the] enrolment of pupils. It used to be up to 200 pupils but now it is up to 400’. In one school visited by the qualitative research team in Zamfara, SBMC members reported a steep increase in enrolled pupils, from 200 to 500.⁴¹ According to schools and community members in the three states, two programmes, the UNICEF Girls’ Education Project 3 programme promoting girls’ enrolment in Katsina and a school-feeding programme in Zamfara – and partly Jigawa – have contributed to the rise in enrolment. This, however, does not hold for all schools. Some rural schools were still struggling to enrol pupils. One reason is the slow process of communities opening up to Western education (see Section 4.2.1).

Teacher shortages

All three states in this evaluation have large teacher shortages which appear to have become worse in recent years (Bennell et al., 2015; Doyle, 2017; Rai et al., 2017). These are set to become more acute with time if enrolment is to expand, and are driven by insufficient recruitment, especially in rural areas.

⁴⁰ This difference is statistically significant at 1% level.

⁴¹ Average enrolment declined in Zamfara since baseline, but in some schools enrolment reportedly rose.

In the quantitative sample for this evaluation, the average number of teachers officially employed per school is 11.⁴² This is a significant decline since baseline, by 8% and 13% for treatment and control schools, respectively.⁴³ With increasing enrolment and attendance, schools confirm that there is a critical shortage of teachers:

Children now come to school unlike before when they don't come. Before you hardly find six to 10 children in the school. But from three years back, there has really been a great change. But the last time I counted more than 170 pupils. This leaves four teachers to look after nine classrooms. (Head teacher, Katsina)

One teacher summarises: 'It is obvious that there is a problem. Whatever you do you must still see a class unattended. This is really discouraging.' In Zamfara, a teacher reports that five teachers in the school in theory have to teach eight grades in a school with only two classrooms. Rural and semi-urban schools seem to be more affected by a shortage of teachers than urban schools.

Class sizes and pupil–teacher ratios

In Nigeria, the official policy is 35 pupils per teacher and the national pupil–teacher ratio is 38 pupils per teacher (Federal Republic of Nigeria, 2004; UNESCO, 2015). But teacher recruitment and deployment are not clearly linked to schools' staffing needs and require teachers' subject specialisations, which results in inefficient teacher allocation, and teachers frequently having to teach subjects they are not specialised in (EDOREN, 2016b).

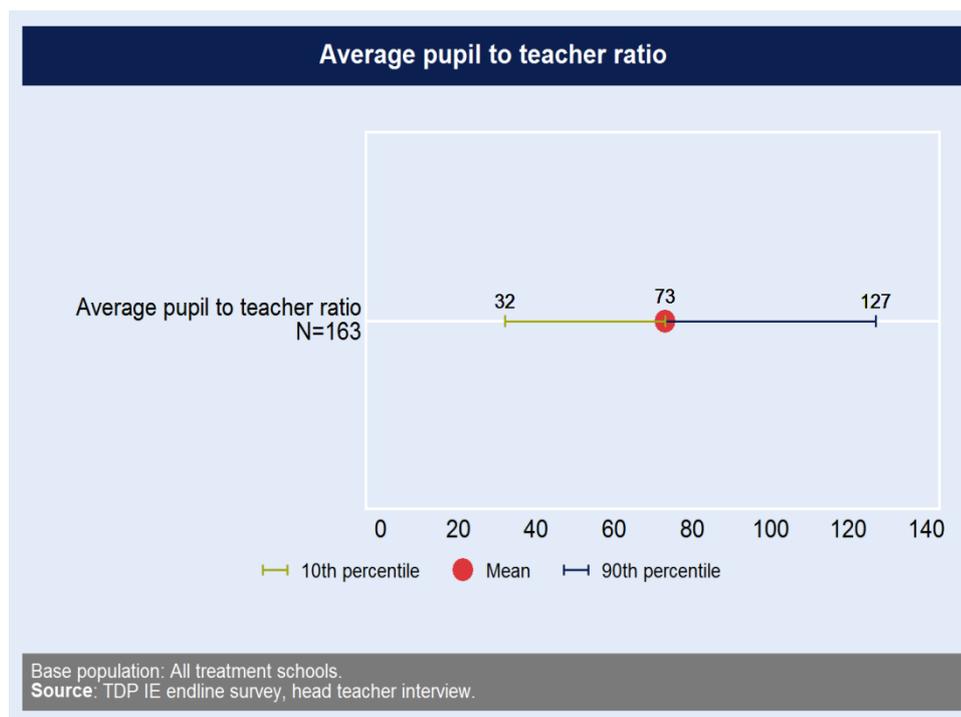
In the quantitative sample schools, the average pupil–teacher ratio is more than twice as high as the official policy and the national pupil–teacher ratio: 73 pupils per teachers in treatment schools and 77 pupils per teacher in control schools (Figure 4.3).⁴⁴ The 10% of treatment schools with the lowest pupil–teacher ratios have 32 or fewer pupils per teacher. At the other end of the distribution, the 10% of treatment schools with the highest pupil–teacher ratios have 127 or more pupils per teacher (this is roughly similar for control schools).

⁴² This excludes voluntary and temporary teachers.

⁴³ This difference is statistically significant at 1% level.

⁴⁴ The pupil–teacher ratios are based on the number of teachers officially employed at the school. If voluntary and temporary teachers are included, these pupil–teacher ratios would be 10–18% lower, depending on the state.

Figure 4.3: Pupil–teacher ratios in treatment schools



Head teachers, teachers, and SBMC members talked about rising enrolment rates leading to overcrowded schools.⁴⁵ However, in lessons observed for this evaluation, there were typically 45 to 47 pupils in the room (Figure 4.4) as pupils are often absent for a variety of reasons (see Section 4.3). The number of pupils observed in classrooms had increased since baseline, by six pupils on average in treatment schools and by three pupils in control schools.⁴⁶ There was considerable variation among schools. In the treatment schools, in 10% of the observed lessons there are 95 or more pupils, while in another 10% of observed lessons there are 14 or fewer pupils.⁴⁷

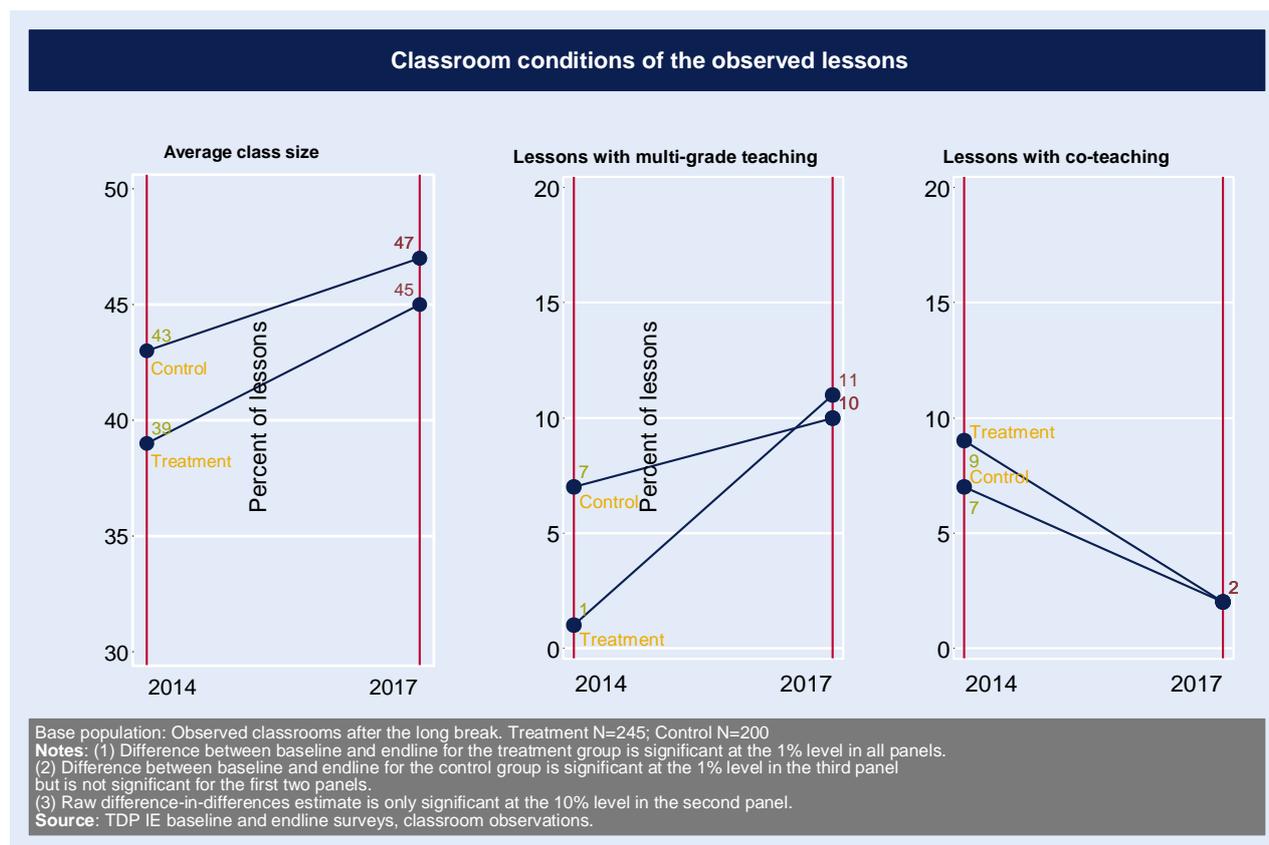
Large classes provide fewer opportunities to use interactive methods and require whole-class teaching methods (Rawle *et al.*, 2017). There is also some evidence for Nigeria that large class sizes reduce teaching quality (Osim *et al.*, 2012). Indeed, in observed classes with more than 100 pupils, teachers were significantly more likely to lead chanting than in the smaller classes, indicating that large class sizes may limit the use of more effective teaching practices (for teacher pedagogy, see Chapter 6). That class sizes are very large in many schools and pose a challenge to effective teaching was highlighted by the impact evaluation’s baseline research in 2014 and formative research in 2016 (De *et al.*, 2016a; Doyle *et al.*, 2016). The TDP training and materials try to address this limitation by proposing techniques suitable for teaching large classes. However, at the early stages of programme implementation, observations revealed limited use of these techniques in classrooms (De *et al.*, 2016a).

⁴⁵ Given that the qualitative research was conducted in Zamfara during the harvesting period, the research team relies on accounts of head teachers, teachers and SBMC members of over-crowded classes rather than on field observations of low school attendance during the school visits.

⁴⁶ This difference is statistically different at 1% level.

⁴⁷ This is similar in control schools.

Figure 4.4: Changes in class size, multi-grade teaching, and co-teaching since baseline



Schools generally have two main ways of dealing with overcrowded classrooms or insufficient teachers to cover all grades: using double shifts or multi-grade teaching (putting more than one class in the same classroom at the same time). The use of multi-grade teaching has risen significantly since baseline in the treatment schools (from 1% to 11% of observed lessons), and it has risen by significantly more than in control schools. Multi-grade teaching is a widely reported practice, and the impact evaluation baseline research found that some schools were using multi-grade teaching because of a shortage of classrooms. Teachers had little knowledge or skills on how to teach these multi-grade classes, and described using informal methods, for instance, rotating the grades so that different pupils were sitting at the front during different periods (De *et al.*, 2016a).

Over the same period, co-teaching declined significantly, from being used in 9% of observed lessons to 2% in treatment schools, and from 7% to 2% of lessons in control schools, which may be related to the reported teacher shortages.⁴⁸

4.5.3 Availability of teaching and learning materials

Inadequate access to teaching and learning materials tends to reduce teaching quality (UNESCO, 2015). Across the three states, teachers and head teachers reported a lack of teaching materials. Teachers had a textbook in only 56–57% of the lessons observed in the quantitative survey, fewer than at baseline. A school in Zamfara reports not having received the relevant textbooks for their pupils, which leaves them having to borrow them from neighbouring schools. A head teacher in Jigawa notes: ‘[...] we don’t have reference textbooks like Macmillan that we can use as reference to teach effectively so you cannot get examples to demonstrate.’

⁴⁸ This difference is statistically different at 1% level.

By contrast, in over 90% of observed lessons in the quantitative survey, there was a functioning blackboard or whiteboard and chalk or a marker.

While pupils often do not have notebooks or pencils, schools lack funds for chalk, records, diaries, and writing materials for teachers. A common mechanism to fund these teaching materials is via parental contributions, but often parents are not able to pay these small charges. In these cases, there is evidence of SBMC members taking on some of the financial responsibilities and purchasing chalk, teachers' diaries, or records. In several schools, teachers, despite their own lack of funds, buy teaching materials for the classroom, but also emphasise that they cannot make up for the missing learning materials:

The teacher cannot be giving paper to the pupils every day so the parents should buy for them or the government should come in once in a while. The pupils can disturb the parents to buy for them. You cannot assist the pupils if you cannot assess what he has done. (Teacher, Katsina)

In the baseline study, it was often observed that teachers alone held a copy of the textbook, from which they copied passages on to the board for pupils to copy in turn, so that a large part of each lesson is spent in copying. The lack of written materials for pupils to refer to during lessons and afterwards is likely to hamper learning and reduce the effectiveness of attempts to improve teaching.

4.5.4 Language of instruction

A key determinant of learning is pupils' familiarity with the language of instruction. Therefore, to achieve early literacy and numeracy, instruction in pupils' home language in the early grades before switching to an international language is important (Bashir *et al.*, 2018; UNESCO, 2017; World Bank, 2018).⁴⁹ This is the policy in Nigeria, where the language of instruction in Primary 1–3 should be the home language or the language of the immediate environment of pupils, which is Hausa in the three states, with English taught as a subject. English should then gradually be introduced as the language of instruction from Primary 4 (Adekola, 2007; Federal Republic of Nigeria, 2004). However, there are several issues in terms of implementing this policy. In Primary 1–3, textbooks and other materials are produced in English. Recommendations from the impact evaluation baseline research included producing textbooks and early-grade learning assessments in Hausa but cautioned that teachers may struggle to use textbooks written in Hausa as they are unfamiliar with the written language (De *et al.*, 2016a). Moreover, during pre-service training future teachers are not trained to teach in a bi- or multilingual environment (EDOREN, 2016b).

Nearly all the sample pupils (99%) speak Hausa at home. At endline, during 42–47% of the observed Primary 1–3 lessons (excluding English lessons), teachers used only Hausa, in line with the national policy on language of instruction, while 48–54% of teachers used both English and Hausa, and the remainder used only English (Figure 4.5).⁵⁰ The mixing of English and Hausa by such a large proportion of teachers while teaching the lower grades is surprising given that the home language of nearly all the pupils is Hausa and that teachers have low English language skills (see Section 4.4.1) and limited confidence teaching in English, but is likely to reflect the use of English language textbooks and examinations.

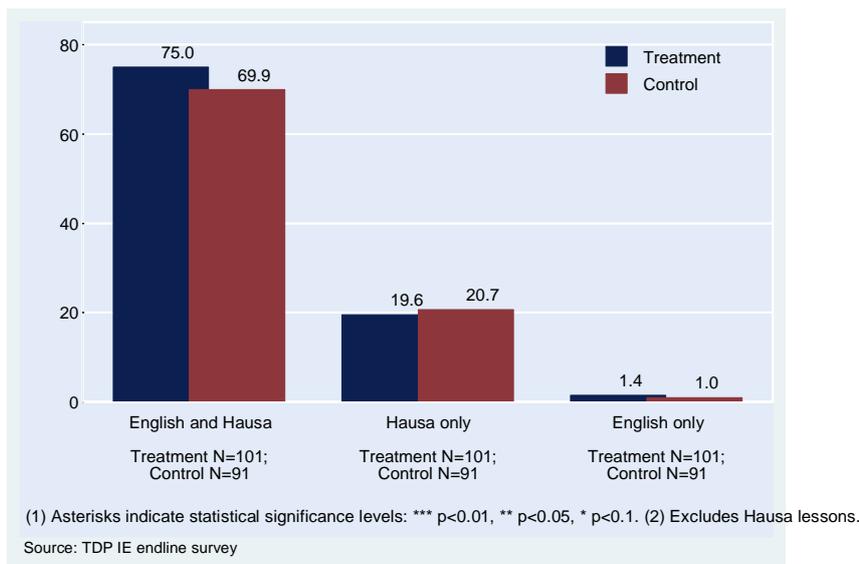
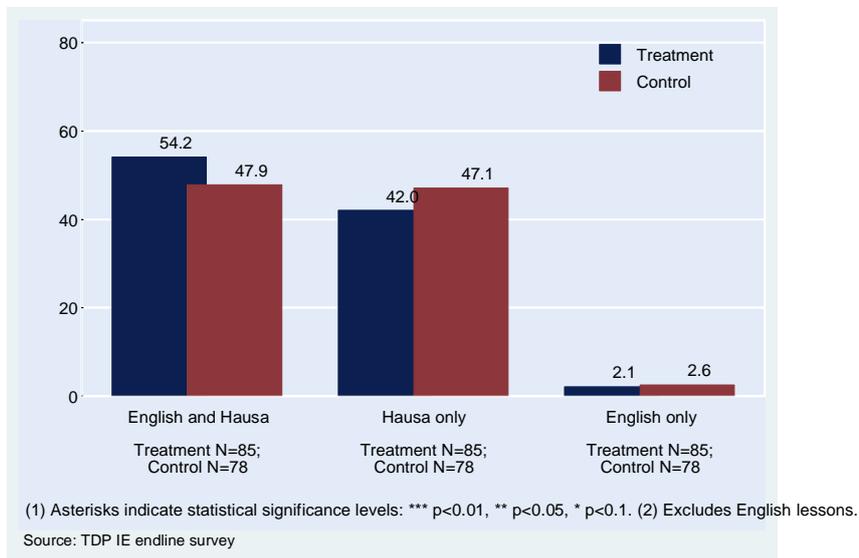
For the observed Primary 4–6 lessons, 70–75% of teachers used both English and Hausa; 20–21% used only Hausa; and the remainder used only English. While teachers are generally aware they should be teaching in English from Primary 4, across the states they emphasised the use of Hausa to ensure that pupils understand the lesson and concepts. This is consistent with the finding that at baseline, 61% of Primary 3 pupils demonstrated only pre-literacy English skills, meaning they were below their expected grade level by two full grades (see Chapter 7). Teachers state that they use Hausa to facilitate pupils' understanding, but

⁴⁹ Supporting the importance of a match between pupils' home language and the language of instruction, evidence shows that on numeracy, Nigerian pupils perform better on non-worded items than on worded items, that is, on test items that are less language dependent (Adekola, 2017).

⁵⁰ The three languages, English, Hausa and other, do not sum to 100% because teachers could also be silent.

the preference for teaching in Hausa is also due to their own low levels of English knowledge. The qualitative lesson observations found some teachers teaching in English and translating the lesson into Hausa incorrectly, indicating that the practice of switching between languages may not always be helpful given teachers' poor English proficiency.

Figure 4.5: Languages used by teachers during lower and upper grade lessons at endline



4.6 Summary: context

Table 4.1 summarises the key evaluation questions and assumptions in the TDP evaluation framework that are addressed in this chapter, along with an assessment of whether assumptions are satisfied and the strength of the evidence. The summary table illustrates how challenging the context is for TDP. None of the contextual assumptions for the programme to work are fully satisfied. Many children do not attend school regularly, are unlikely to receive adequate support for learning at home, and (by Primary 4) lack the capacity to learn using English materials. Teachers use a mixture of Hausa and English in most lessons, and are hindered particularly by their low literacy in English. Very high teacher transfers mean that teachers are not retained in schools where TDP operates. At baseline it was shown that teachers lacked the capacity to absorb and apply new knowledge about pedagogy. Large and growing class sizes and a continued lack of classroom materials also make it more difficult for changes in teacher practices to have an impact.

Table 4.1: Summary of evaluation questions and evidence for them⁵¹

Evaluation question / assumption	Assumption satisfied	Evidence strength
Is this assumption correct in the Nigerian context (relevance)?		
Children attending school regularly (Re-13).	No	Strong
Children receiving adequate support for learning at home (Re-15).	No	Strong
Teachers using Hausa to teach Primary 1–3 (Re-9).	Mixed	Strong
Teachers using English to teach Primary 4–6 (Re-10).	No	Strong
What factors facilitated or hindered TDP’s achievement of its outcomes (effectiveness and impact)?		
The TDP materials are appropriate for pupils of different abilities, particularly around language (Effe-26).	No evidence	
Selected teachers being retained in schools where TDP is operating (Effe-15/Re-20).	No	Strong
Selected teachers being class ready, in other words have the capacity to apply their new knowledge (appropriate qualifications, training in the last three years) (Effe-16).	Mixed	Strong
Teachers have the basic language, subject knowledge, and pedagogical skills to absorb the new knowledge and skills available from TDP (Effe-25).	No	Strong
Curriculum and materials are appropriate to the language and ability of pupils (Im-14/Re-18).	No	Moderate
Children have the capacity to learn from improved teaching in the language of instruction (they are school-ready) (Im-9).	No	Strong
Children supporting their peers to learn (Im-11).	No evidence	
A class size small enough to allow improved teacher effectiveness to have an impact (Im-12/Re-16).	No	Strong
Adequate classroom materials being available (Im-13/Re-17).	No	Strong

Abbreviations (Effe-22 etc.) refer to assumptions listed in the evaluation framework; see Annex A, Volume II.

⁵¹ It was planned that indicators Effe-26 (appropriateness of TDP materials for pupils of different abilities) and Im-11 (children supporting peers to learn) would be covered in qualitative data, but there were no clear responses from qualitative participants relating to these topics.

5 School leadership and management

5.1 Role of the head teacher as a school leader

The role of the head teacher in managing the school and spearheading its development is well documented in the literature as one of the key elements to a successful school. These studies, largely conducted in the USA and Europe, find that head teachers have a substantial impact on pupil achievement (Bloom *et al.*, 2015; Branch *et al.*, 2013; Fryer, 2017). These studies all recommend improved support and training for head teachers because improved school leadership leads to improved learning environments and improved learning outcomes. However, as Moorosi and Bush (2011) argue in a review of training for school leaders in Commonwealth countries, including Nigeria, leadership training in itself is not enough. The context within which the head teacher is placed at the helm of the school matters and shapes their experiences and response to training. The role that head teachers are expected to take also matters and differs between countries. In Nigeria, head teachers have little power to discipline or recruit teachers, which limits the scope of their leadership role.

Evidence also shows that how functional a school is prior to the implementation of education quality improvement programmes affect its ability to take advantage of and benefit from such interventions (Hopkins, Harris, and Jackson, 1997). In Nigeria, head teachers do not receive any specific leadership training before taking on their responsibilities as school leaders, which leaves those with less previous leadership and management experience unprepared for the challenges they may face (Moorosi and Bush, 2011). TDP provided head teachers with leadership and management training to improve their ability to support teachers (see Chapter 3). This was because strengthening head teachers' leadership and management skills was considered an essential part of improving teacher effectiveness and of achieving greater impact. TDP assumed that head teachers would have the motivation, willingness, and resources to convert the skills acquired into practice.

Box 4: Head teacher background characteristics

At endline the vast majority (87%) of head teachers in treatment schools have an NCE, and this has not changed significantly since baseline. Among the head teachers who do not have this qualification, most have less than a NCE, which may be considered insufficient to provide academic leadership.

At baseline, 23% of head teachers in treatment schools had received some type of in-service training on school leadership and management during the two preceding years. This had changed notably by the endline three years later, when 94% of treatment head teachers had received such training, primarily from TDP (90%), but also from the Global Partnership for Education (28%), ESSPIN (13%), and SUBEBs (10%).⁵²

Just over half of head teachers (52%) regularly teach primary classes, and as school size increases head teachers become less likely to teach (see Section 5.3).

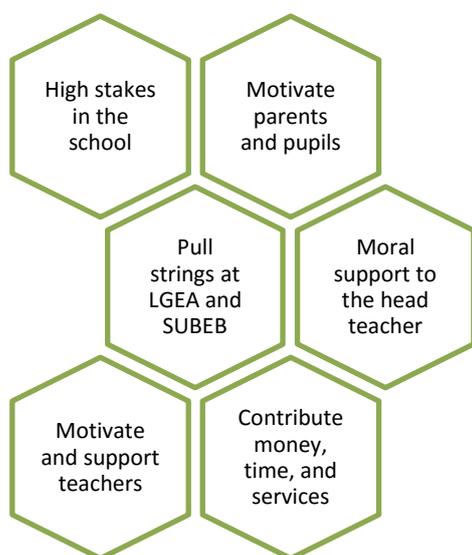
Resourceful head teachers often turn to the SBMCs as their first port of call to solve problems. It was observed in qualitative interviews that when head teachers and SBMC members were successful in sharing challenges and finding solutions, they jointly assumed leadership positions and found novel solutions for the school. Interviews with head teachers and SBMC members also revealed that SBMCs had pulled together solar panels where schools requested electricity; found a benevolent donor to construct a handpump and a computer lab in one school; helped with fixing desks; and helped to convince parents that they should send their children to school.

⁵² These training categories do not sum to 100% as head teachers may have received more than one type of training. For instance, in Jigawa, a head teacher may have received both ESSPIN and TDP training.

Strong, empowered, and often influential SBMCs played two other important roles in relation to head teachers – that of monitoring and of mobilising resources, which may not be in the power of the head teacher to do alone. In a well performing school in Jigawa, the SBMC created a governing board of members who would supervise teachers and report to them as they were ‘not convinced with the internal supervision’. On mobilising resources, an SBMC in Katsina decided to expedite the school’s request for more teachers by advocating on the school’s behalf.

The SBMC has been approaching the ministry in order to get assistance and support for the school, without an SBMC the school will have to wait until the ministry comes to their aid. Again the SBMC chairman visits the school, goes round to observe the teachers and encourage them, enquires about what the school needs and always tries to address any challenge the school is having. All these ones are as a result of the formation of the SBMC and these things were not happening when there was no SBMC. (SBMC Katsina, medium performing school)

Figure 5.1: SBMCs: the missing link in the TDP leadership and management model?



While the head teacher–SBMC partnership in managing the school was observed to be stronger in well performing schools visited by the qualitative research team, schools which were medium to poorly performing also shared cordial and supportive relationships that appeared to be benefiting the school.

5.2 Has TDP improved head teacher leadership and management?

This section presents findings from the quantitative research on selected head teacher leadership and management practices, along with information from the qualitative research on head teachers’ knowledge of the TDP training and their attitudes towards what they have learned about school leadership and management.

5.2.1 Head teacher relationship with teachers and pupils

Despite their day-to-day concerns related to the administration and management of their school, the head teachers shared that the TDP training had increased their knowledge about managing their relationships with teachers and providing them with constructive feedback and support. Teachers said that they would go to the head teacher first when they needed help and support with their work. However, the role of the head teacher did not come up as a factor that motivated teachers to teach, nor did teachers mention increased support and supervision from the head teacher when asked about the changes brought about by TDP in the last three years. This lack of triangulation of data from different respondents and sources

weakens the evidence on improved head teacher and teacher relationships and the role TDP may have played in improving support in the school.

Head teachers said that the TDP training had changed their response towards pupils and that they now try to find solutions to problems in ways that they had not thought of before. In the example below, the head teacher speaks of how he was appointed to the position without the requisite knowledge required to handle the challenges that come with it, and shares an example of a consultative, sensitive solution towards a problem. This also illustrates a recurring view expressed by head teachers – of being assigned responsibilities without always having the skills to fulfil them.

I was not concerned about child self-esteem before, I ask children to sweep when they come late but we now ask the child the reason of his late coming. This is all because of the training I received. There is this child that always comes late so I asked him why he comes late and he said he fetches water and sell to buy food to eat before coming to school, so I wrote it down and discussed with the teachers on how to handle the child's case when he comes late in order to assist him, after our findings we found the boy had a younger sister too, so we took the case to SBMC and it was decided that someone will provide the child with food every morning before coming to school. The child has finished and gone to the next level. This is all because of the training we received, we never had ideas like this before, and if you are appointed a head teacher you only get proud of it without knowledge of how to handle the appointment. (Head teacher Katsina)

SBMC members were asked open-ended questions by the qualitative research team about the most significant change they had witnessed in the school since the baseline – and often shared that improved leadership was one of the biggest positive changes in the school.

To be honest this school, we have seen it progress and this is as a result of the new headmaster that came here. I must say he is giving his best to the school and he is a lover of children. He has got so many good commendations based on the pupils. [Name anonymised], we are seriously giving him the support we can to help move this school forward. There has been serious progress here and I have been a witness being that my younger brother was trained here. And now he is doing well. (SBMC member Zamfara)

When asked what they liked the most about their school, pupils mentioned their head teacher because he would engage them in group activities and ensure that everyone had understood the lesson.

5.2.2 Changes in management of pupil and teacher attendance

At endline head teachers in treatment schools continued to face some of the same first order problems as at baseline, such as low pupil attendance and ensuring pupils stayed in school throughout the day. Poor pupil attendance seemed to be a primary concern in many schools. In the qualitative research, pupil attendance was more of a problem for the schools in Zamfara than in Jigawa or Katsina.

Head teachers also spend their time ensuring that teachers are in the school on time, and then in their class and teaching. Their role is part-disciplinarian, part-counsellor, as teacher transfers and shortage of teachers mean that teachers are unhappy about their workload and lack of support. Head teachers lack the powers to sanction poor performance so cannot effectively hold teachers accountable or provide resources to alleviate constraints, but try their best to pacify teachers.

At times you find teachers enjoying discussion between them forgetting the time of their period, so I do go round reminding them. This alerts the others and even those that are supposed to be in a class at the time but are still in another are also reminded. This is mostly what I do. (Head teacher Jigawa)

Over 90% of head teachers in the quantitative sample said they had taken action to improve pupil attendance; similarly, over 90% said they had taken action to improve teacher attendance. These proportions had declined slightly since baseline, when close to 100% of head teachers said they had taken such action, with a larger decline in treatment schools than control schools. It is not clear why some head teachers in treatment schools may have stopped taking such action.

For the treatment head teachers who acted to improve pupil attendance, the most common actions were to: involve the SBMC (84%); discuss with teachers, pupils, or parents (71%); and provide free-of-charge learning materials (24%), uniforms (14%), and financial support (13%). The proportions of head teachers taking these actions have increased significantly since baseline. This is also the case for control schools, indicating that these changes are not related to TDP. The proportion of treatment head teachers involving the SBMC has increased by nine percentage points, which is supportive of the finding from the qualitative research that some head teachers are involving the SBMCs to help improve school performance. The quantitative survey also found that the provision of learning materials, financial support, and uniforms free of charge has increased, suggesting that head teachers may have become more aware that financial limitations are preventing some parents from sending their children to school (see Chapter 3).

Teacher attendance, by contrast, is largely dealt with within the school by the head teachers discussing with teachers about their attendance (75%); drawing a line in the teacher attendance book (so that latecomers' names are written below the line and a record is kept of teachers' timeliness) and following up on absences (50%); and insisting on written absence requests (34%).

5.2.3 Changes in head teachers' support for teachers

In the qualitative interviews, head teachers spoke of providing teaching support to teachers – through class observations and feedback after the lessons were over, and through professional development meetings with teachers that allow them to address concerns. At the same time, not all teachers reported that the head teacher observed their lessons.

In the endline survey, 94% of head teachers in treatment schools report that they conduct lesson observations. However, it appears that in some cases they do not conduct observations very frequently. Of those who conduct observations, 34% conduct lesson observations less than three times per term. Only 72% of head teachers in treatment schools had conducted a lesson observation during the past 10 school days. This is a significant decline compared to baseline, when 79% had (the situation is similar for control head teachers). It is not clear what the reason for this change since baseline is, but time may be one constraint. Head teachers may be spending more time on record-keeping and other duties so that less time is left for lesson observations.

Although head teachers were able to recall the content of the TDP leadership and management training, as is illustrated in the qualitative interview with a head teacher in Katsina below, they may not always have the time to practice what they have learned.

Head teacher: The teacher will come and tell me when he is going so that we go together to the class. We will be chatting and be going like friends. I will sit in front of the class to avoid distracting the pupils. Because some of them will be turning around if I sit at the back to find out what I am doing. So will sit among the pupils and be observing and be taking notes in areas where there are lapses and where he is doing well. After that we come out and then I will brief him and point out where he needs to improve and where it is ok. I normally say improvement because it is a better way of saying it rather than saying he has not done well. And I will stylishly say if I were you I would have done it this way not the way you did.

Interviewer: How many times do you conduct lesson observation?

Head teacher: It depends. Sometimes before the end of the term we do more than 15.

Interviewer: For every teacher?

Head teacher: No, not every teacher.

Interviewer: How many times in a week do you conduct lesson observation?

Head teacher: Like me now, because of the volume of work I have not done any. But some other teachers have, some twice, some thrice this term. (Head teacher, Zamfara)

Most head teachers hold formal meetings with teachers about issues that concern day-to-day school meetings; 58% of head teachers said they did this at least once per month. However, this proportion had declined significantly since baseline, when 70% of head teachers said they held such meetings at least once per month.⁵³ Additional research would be needed to determine the reason for this change. A number of different topics are discussed during these meetings. The ones most commonly reported by head teachers are: teachers' absenteeism and/or punctuality (72%); pupil attendance (63%); teaching practices (43%); and lack of materials (30%).

Box 5: Head teacher turnover is very high in all three states

Head teacher turnover in the sample schools is extremely high; 59% of head teachers who were at the school at baseline were no longer there at the endline three years later. The reasons for head teacher turnover were not collected by the endline quantitative survey but transfers, leaving the profession, and (to a small extent) retirement are likely to together account for most of the turnover.⁵⁴

This high turnover is likely to affect head teachers' ability to apply the skills acquired during the TDP training to support teachers.

5.3 Do head teachers have the incentives and motivation to apply their new knowledge?

In interviews with head teachers, SBMC members, and teachers, and from observations in schools conducted as part of the qualitative research, there were several testimonies to the head teachers' motivation and resolve to improving their schools. Head teachers constantly tried to find ways to support their schools that went beyond their call of duty, whether it was borrowing textbooks from other schools when their own had not arrived or speaking with traditional leaders in the community to encourage the community to send their children to school.

When asked what their vision for the school three years from now was, head teachers demonstrated a clear vision and high levels of motivation to achieve it. All the head teachers wanted all their pupils to perform well, for them to be recognised in the state and the country as scholars, and to be proud of their schools. They sought to improve the infrastructure and the number of teachers in the school, to improve enrolment, and to reduce the drop-out rates for girls. However, they were unable to convert this vision into practice despite their best efforts, which may reduce their motivation.

[W]e are really grateful because the training we received from TDP. We use them accordingly and the pupils are understanding as supposed. But the only problem we face is when a child comes

⁵³ This result is similar if the analysis is restricted to the panel of treatment head teachers.

⁵⁴ Only 2% of the baseline head teachers were due to retire by endline.

today, it takes time before he comes again so all your effort as a teacher is to no avail sometimes.
(Head teacher, Zamfara)

Two reasons frequently cited for low teacher motivation in Nigeria are low salaries, particularly compared to salaries received by other civil servants, and payment delays (Humphreys and Crawford, 2015; Rai *et al.*, 2017). Among the treatment head teachers, the timeliness of salary payments varies, with 70% always receiving their salary on time; for 9%, salary payments are usually delayed, and for 1%, they are always late. There are also issues in terms of head teachers not receiving the correct salary amounts. Delayed, and sometimes very delayed salary payments, can act as a demotivating factor (see Chapter 6).

When excessive, workloads can also influence motivation, for example, if head teachers feel these make it difficult or even impossible to do their job as intended. Among the treatment head teachers, 44% consider their workloads excessive. The primary reasons for head teachers considering their workload excessive are: teacher shortages (58%); having too many administrative and clerical duties (56%); and teaching too many classes (40%).⁵⁵

The treatment head teachers reported on their absenteeism from school, and 65% were absent one day or more last term, an increase from 48% at baseline. The increase in training provision since baseline (see Box 4) accounts for a large part of this rise in absenteeism. When asked about the last five days, 24% of treatment head teachers report that they were absent, which compares to 16% for control teachers. One possible reason for this difference is training because a significantly larger proportion of head teachers reported being absent because of training (40%) than for control teachers (21%). The two other most common reasons for absence include: own or family illness (27%), and meeting with the LGEA or SUBEB (18%).

Box 6: The head teacher as the leader of the school

Zamfara LGA 1 case study of school leadership

The head teacher, with the help of the SBMC, forms a powerful backbone for the school, providing leadership and direction and often going above their mandate to ensure that the school is successful. The following example is from a school in Zamfara. The head teacher was transferred to this school from the city. He had not been promoted since 2011 and not received his salary for the last six months. Despite these concerns, he was engaged in the school, with its students, teachers, and the community to provide the support the school needed to improve. The HT had been transferred to the school a few years ago. On his transfer, he realised that parents did not send their children to school, and enrolment was especially low for girls. The school had only two female students as the rest had all dropped out. To increase enrolment, he worked with the SBMC to meet parents whose children were not in school to encourage enrolment. He also spoke with local political and religious leaders, to encourage their community to send children to school. In addition to this, he developed a campaign, using examples of local women who had had found work and supported their families financially to encourage girls to enrol and stay in school.

The school visited by the qualitative research team had poor infrastructure, including leaky roofs and crumbling walls, a condition that was common in several schools in Zamfara, and lacked resources. The head teacher said that when he had just been transferred the previous head teacher had also warned him about other teachers turning up late. As a solution to the poor infrastructure, place was sought in a mosque close to the school so that students could be relocated there when it rained. When the school lacked text books, the HT borrowed some from a neighbouring school to make sure that lessons could continue. To address the problem of teachers coming late, he began to come even earlier to set an example, beginning lessons as soon as it was time to do so. The HT said with the

⁵⁵ The only significant difference compared to control teachers is that 42% report too many administrative and clerical duties as a main reason, compared to 56% of treatment teachers.

teachers they develop a timetable for lesson observations, three times a week and when he goes, he sits at the back of the classroom observing the teacher and provides feedback after the class was over in an attempt to minimise disruptions during the class.

Discussions with the SBMC further strengthened the importance of the role of HT in the school. SBMC members had noticed a significant change in the teaching practice and students' performance after this head teacher had moved to the school. They felt that the head teacher was 'blessed' with leadership qualities and an ability to relate to everyone.

This example is indicative of the role a head teacher often played in their school. Despite factors that would be considered demotivating to conducting their responsibilities, head teachers were engaged with the school's administration, supporting teachers and students and engaging with the community to improve the school.

5.4 TDP, LGEA, and SUBEB support to schools

5.4.1 TFs and TDTs

At endline TFs in all three states who were interviewed by the qualitative research team, said that they visit schools and participate in professional development meetings with the head teacher, especially if the head teacher has requested their support with a particular issue. During their visit, TFs said they also spend time in classrooms observing and supervising teachers, where they pay attention to teachers' lesson plans and their delivery in the classroom. Occasionally they come across a teacher who is doing exceptionally well, or is not following teaching protocol, and in these cases they either commend the teacher performing well or discuss with the head teacher how they can support the teacher who is not performing in the classroom and address the problem diplomatically. Overall, TFs showed an in-depth understanding of the training provided to them and an appreciation of TDP's methods.

Discussions with TFs and TDTs at endline revealed that TDP had changed their appreciation of the importance of learning in the classroom, versus copying from the blackboard, and the importance of praise – for example, by learning several different ways for pupils to clap, applauding their own or their classmates' responses – and of creating an equitable learning environment in the classroom.

School support visits have had variable feedback from head teachers. Occasionally the TFs focused on pointing out problems, leaving the head teacher to find ways to address some of the more immediate problems raised, as in the example below.

Interviewer: What sort of feedback did you get from their last [school support] visit?

Head teacher: After the last visit, they invited us for a meeting. I called my teachers and we used a classroom. They pointed to a place where pupils urinate and dump refuse, and said it is unhygienic and should be stopped. And that they observed a number of classes without teachers teaching after consulting the timetable and some of the teachers entered their lessons late. They pointed out some of our lapses.

Interviewer: Does the feedback make any impact?

Head teacher: Yes, it does, for instance the following day I had to get labourers to clear the dump site and also cleared some of the grasses. The teachers also were more serious after the feedback. (Head teacher, Jigawa)

In other cases, head teachers appreciated the visits and constant support provided by school support officers.

They [TFs] try no matter how late, sunny, or busy they are to give that message to the staff of the school. And if it means coming over they come, because they come for supervision to see how we are doing our work. They are the people we sit with and talk at the end of the month and they still follow us [...] to our schools to see how we do our work. (Head teacher, Zamfara)

5.4.2 SUBEB and LGEA staff

Most contact between the SUBEB and LGEA and head teachers takes place through school inspection visits (De *et al.*, 2016a). The relationship with LGEA staff is varied; some head teachers have a strained relationship with them, whereas others find greater support from LGEA and SUBEB staff. In one interview, the head teacher said that he hardly ever went to the LGEA.

You see, the LGEA is responsible for admission and transfers. Most people go there to bribe their way out. For example, some are not convenient with where they are transferred to and therefore request changes, but as for me I am ready to do my job wherever I am posted to work. (Jigawa)

Among the quantitative sample schools, the frequency of school visits by LGEA or SUBEB supervisors differs greatly. At endline a small group (3%) of treatment schools did not receive any visit by the LGEA or SUBEB supervisor during the last school year; most schools (74%) received at least one visit last year but not more than three visits per month; and 24% were visited more than three times a month (the results are similar for control schools). This was a significant change from baseline when all schools received at least one visit and is mainly driven by Zamfara where 7% of schools did not receive any visit (compared to 3% of schools in Jigawa and all schools being visited in Katsina), and visits were generally less frequent than in the other two states.

Not all TFs and TDTs are convinced that LGEA and SUBEB staff are able to conduct support visits according to TDP's style of support because, in their view, TDP has not yet succeeded in training SUBEB and LGEA staff on the principles of school support in the same way TFs have been trained. But as is discussed above, SBMCs could help broker stronger relationships with LGEA and SUBEB staff.

TF 1: So one of the experiences I have had during the school visit, the teacher when you come for school visit, they will appreciate the way we observe them and comment based on their teaching but when the staff of LGA go for school visits, some of them you will see they are fighting with them and the observer because of the way they have observed them. The way they have commended based on their teaching is not relevant to what the TF or TDP [recommended in] their training. So this one is another problem, the school support visit will no longer [be] sustained.

TF 2: Because TFs and TDP were trained on mentoring and monitoring. They use to mentor the teachers but these people they use to monitor. They are fault finders while TFs are partners in progress. (TFs, [state anonymised])

5.5 Summary: school leadership and management

Table 5.1 summarises the key evaluation questions and assumptions in the TDP evaluation framework that are addressed in this chapter, along with an assessment of whether assumptions are satisfied and the strength of the evidence. The evidence on school leadership and management is mixed. Head teachers are doing less of some key activities such as lesson observations, meeting with teachers, and taking action on teacher and pupil attendance. Head teachers themselves felt that there was an improvement in their relationship with teachers and pupils as a result of the training, but teachers did not comment on this when

asked about key changes in the school since the TDP intervention started. Head teachers were reportedly highly motivated and resolute about improving their schools, but many considered their workloads excessive. Head teacher absence from the school and high head teacher turnover may prevent good practices from being embedded in schools.

Table 5.1: Summary of evaluation questions and evidence for them

Evaluation question / assumption	Assumption satisfied	Evidence strength
What factors facilitated or inhibited TDP's achievement of its outcomes (effectiveness)?		
Has TDP improved head teacher leadership and management (Effe-5)?		Mixed
Selected teachers being supported to apply their new knowledge (Effe-17/Effe-18).		Mixed
Head teachers have appropriate incentives and motivation to apply their new knowledge in support of teachers (Effe-21).		Mixed
Were TDP results achieved on time and in full (efficiency)?		
Provide continuous support to teachers for a prolonged period of time and embed this mechanism in both schools and the TDP states' teacher education systems (Effi-8).		Mixed

Abbreviations (Effe-5 etc.) refer to questions or assumptions listed in the evaluation framework; see Annex A, Volume II.

6 Teachers

For effective teaching and learning to take place, teachers need adequate knowledge of the subjects they teach and pedagogical skills. They also need access to basic water and sanitation; reasonable pupil–teacher ratios and class sizes; access to teaching and learning materials; and adequate instructional time, which is linked to teachers being present in class (Bashir *et al.*, 2018; World Bank, 2018). These conditions are discussed in detail in Chapter 3 and are referenced in this chapter as relevant.

The TDP in-service training seeks to create more effective teachers by improving teacher pedagogy and subject knowledge to raise pupil learning levels. The programme also provides teaching materials and equipment to help prepare lessons and for use in the classroom with pupils (see section 3.2). But it does not address school infrastructure and classroom conditions such as the number of usable classrooms, class size, and pupil–teacher ratios. These issues all affect the extent to which knowledge and skills acquired during the teacher in-service training can be translated into more effective teaching.

The quantitative research assessed teacher subject knowledge and examined teacher pedagogy through classroom observations and teacher interviews. It also measured teacher absenteeism using school records and self-reporting, and assessed teacher motivation levels using teacher interviews. The qualitative research used classroom observations, in-depth interviews, and participatory research exercises to explore perceptions of changes in teachers' subject knowledge and pedagogy, factors that affect teacher motivation, and challenges faced by teachers.

6.1 Has TDP improved teacher subject knowledge?

Teachers' subject knowledge has not changed in mathematics or science, and appears to have worsened since 2014 in English (Figure 6.1). There is no difference between schools that have received TDP intervention and those that have not. TDP provided training to teachers in treatment schools on completing the tests, using copies of the actual test paper, and in some cases teachers were able to take away the test papers for practice (see Volume II, section 4.6). This is likely to bias test results upwards in the treatment schools, and has to be taken into account in interpreting the results below. Despite this bias, there was no improvement among teachers in treatment schools. This confirms that teachers' test performance cannot be explained by their being unfamiliar with the test format, and genuinely reflects their subject knowledge.

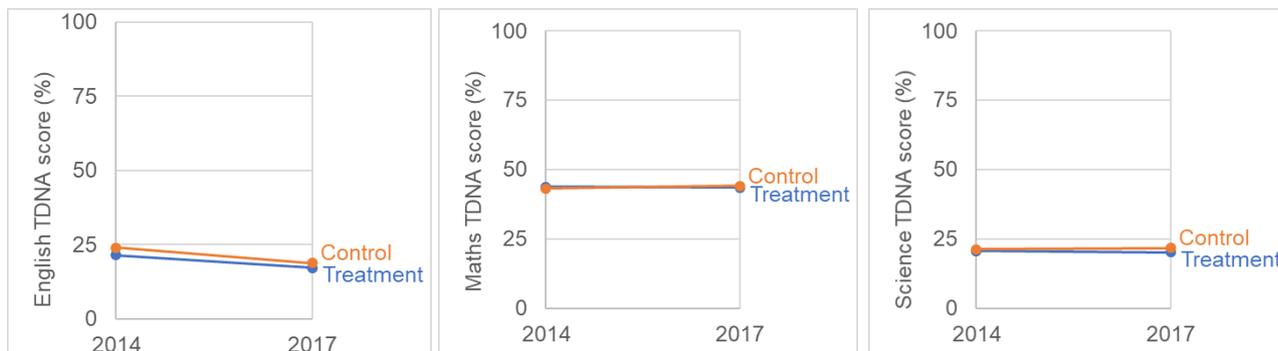
The test involved tasks similar to those that teachers would face in their day-to-day work teaching at primary level, with items based on the Primary 4 syllabus (Johnson and Hsieh, 2014). Tasks included correcting pupils' answers to mathematics questions from the Primary 4 syllabus, reading and correcting letters written in English by Primary 4 pupils, and filling in blanks to create worksheets for a primary-level science class. The test yields scores out of 100 for English, mathematics and science. A score of 75% or above is the benchmark for teachers to have 'sufficient professional knowledge' (Johnson and Hsieh, 2014).

Teachers were able to answer correctly only around 20% of the questions in English and science, and just over 40% of the questions in mathematics. In both English and science, most teachers scored below 25% and hardly any teachers scored above 75% (Figure 6.2). Teachers' performance is better in mathematics: most teachers score in the middle of the range, and there is a minority (12% at endline) who are passing the 75% threshold for sufficient knowledge.⁵⁶ The science questions also involved reading and answering in English, and it is likely that teachers' limited literacy in English is partly responsible for their low scores in science. The mathematics section of the test included a mixture of purely numerical questions and

⁵⁶ The distribution of mathematics scores is around the same in treatment and control schools, so the positive performance of some teachers cannot be solely attributed to the test preparation given to teachers in treatment schools.

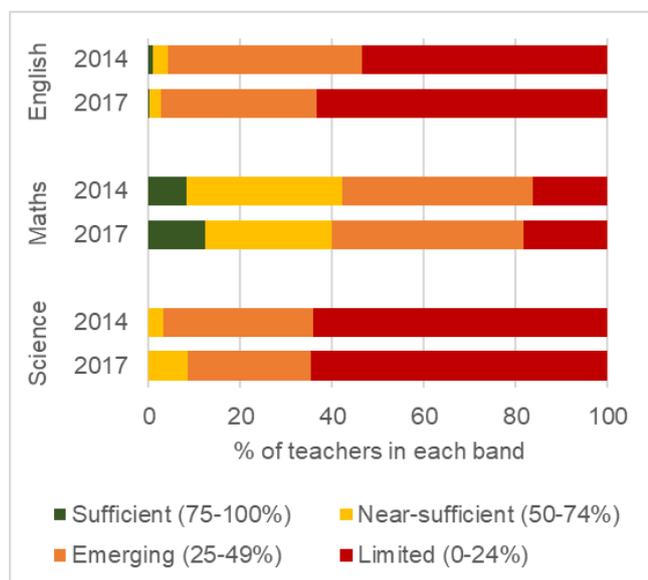
problems that required some English comprehension, and teachers scored much better in this section, although still well below an acceptable level for teaching mathematics at primary school.

Figure 6.1: No improvement in teacher subject knowledge



Results are from the TDNA. The sample is the 554 treatment and control teachers who completed the TDNA at both baseline and endline. A score of 75% is considered 'sufficient' for teaching at primary school in each subject area.

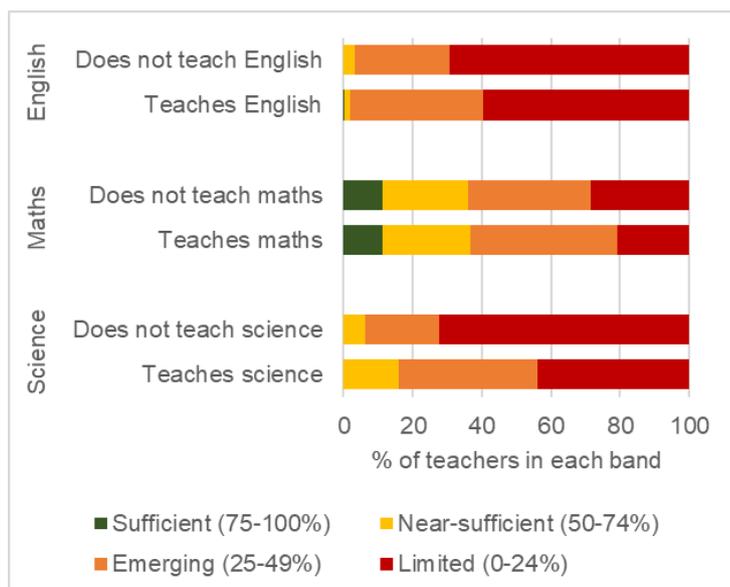
Figure 6.2: Most teachers have limited subject knowledge in English and science



Distribution of teachers according to their scores in each section of the TDNA. The sample is the 554 treatment and control teachers who completed the TDNA at both baseline and endline. The highest band (75–100%) is considered sufficient professional knowledge for teaching at primary school.

Teachers who teach English, mathematics, or science generally did better in the English, mathematics, or science parts of the test, respectively (Figure 6.3). For example, among teachers who do not teach English, 69% were in the lowest performance band in the English test, while among teachers who do teach English, 60% fell into this band. Teachers have better subject knowledge in the subjects they are actually teaching than other subjects, but there are still very large proportions who teach a subject while having very low knowledge of it. In any case, as states attempt to move towards a system of class teachers rather than subject teachers, it will be increasingly necessary for teachers to master basic subject knowledge in the full range of subjects taught in primary schools.

Figure 6.3: Teachers know more about the subjects they teach

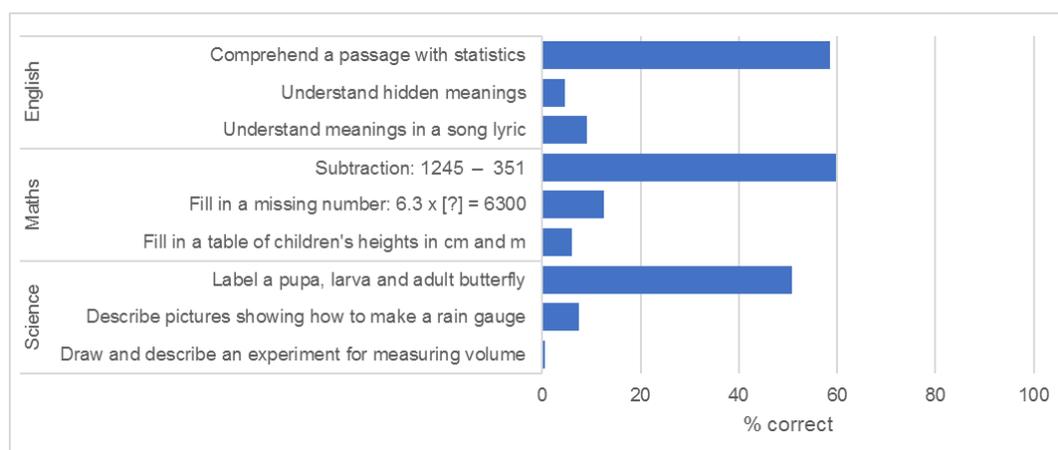


Results are from the endline TDNA and teacher interview. The sample is the 478 treatment and control teachers who were tested at endline, and for whom information was available on which subject(s) they teach.

Teachers in Katsina did better than teachers in Jigawa in all three subjects, although this may have been due to differences in test preparation.⁵⁷ Teachers in Zamfara had the lowest scores in all three subjects. In Zamfara, three-quarters of teachers were in the lowest performance band for English and science, and one-third were in the lowest band for mathematics.

Teachers did better on some types of question than others. For example, around 60% could correctly pick out statistics from a passage or correct a pupil’s incorrect subtraction, around 50% could label a diagram showing different stages of development of a butterfly (Figure 6.4). But very few could answer less straightforward questions such as understanding meanings that are not explicitly stated in a passage, converting centimetres to metres in a table of children’s heights, or describing an experiment.

Figure 6.4: Teachers’ performance varies by question



⁵⁷ Teachers in Katsina were able to take away copies of the test papers after preparation sessions, while teachers in the other states were not. Volume II, section 4.6, describes how the evaluation team dealt with this issue. Monitoring of teachers taking the TDNA was tightened, and a revised version of the test was used in the final week of fieldwork. Tests to assess the possible bias due to test preparation were ambiguous, but suggested a possible effect of 4-6 percentage points for mathematics.

Results are from the endline TDNA. The sample is the 556 treatment and control teachers who completed the TDNA at both baseline and endline.

6.2 Has TDP improved teacher effectiveness in the classroom?

The baseline and endline quantitative surveys observed sample head teachers and teachers while teaching and recorded teacher talk and action, and pupil activity at three-minute intervals (similar to the Stallings [1977] classroom observation system; for descriptors and scoring of practices, see Volume II).⁵⁸ The impact evaluation's overall measure of teacher effectiveness is the proportion of total lesson time teachers spent on positive interaction, that is, using teaching practices classified as effective, with pupils.⁵⁹

6.2.1 Changes in teacher pedagogy in the classroom

The use of teaching practices considered effective has increased significantly between baseline and endline, and increased significantly faster in TDP than in control schools (Figure 6.5). This represents a significant positive impact of TDP on teaching practices and is robust to controlling for confounding factors (Impact Box 1).

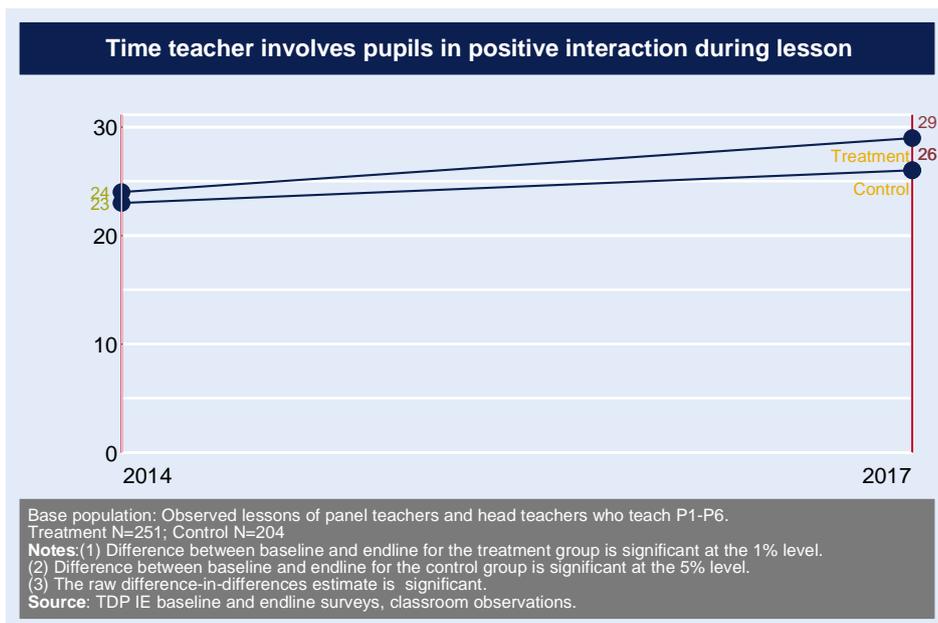
At baseline there were no significant differences between teachers in treatment and control schools in terms of the proportion of lesson time during which they used effective teaching practices – 24% and 23%, respectively. But by endline, the use of teaching practices considered effective had increased significantly, and by more for treatment teachers – to 29% of lesson time compared to 26% of lesson time for control teachers. Despite this improvement, the use of effective teaching practices is still at low levels, indicating the need to promote further the use of effective teaching practices in the classroom.

That the use of effective teaching practices has also increased for control teachers may be related to education programmes other than TDP having provided in-service training in the control schools (see discussion in Section 2.1.3 and Volume II). Using statistical methods to control for this and other confounding factors reveals that there is a robust positive effect of TDP on classroom practices (Impact Box 1).

⁵⁸ All sample head teachers and teachers who regularly teach Primary 1–6 classes were observed. Nearly all the sample teachers teach primary classes and 52% of the sample head teachers.

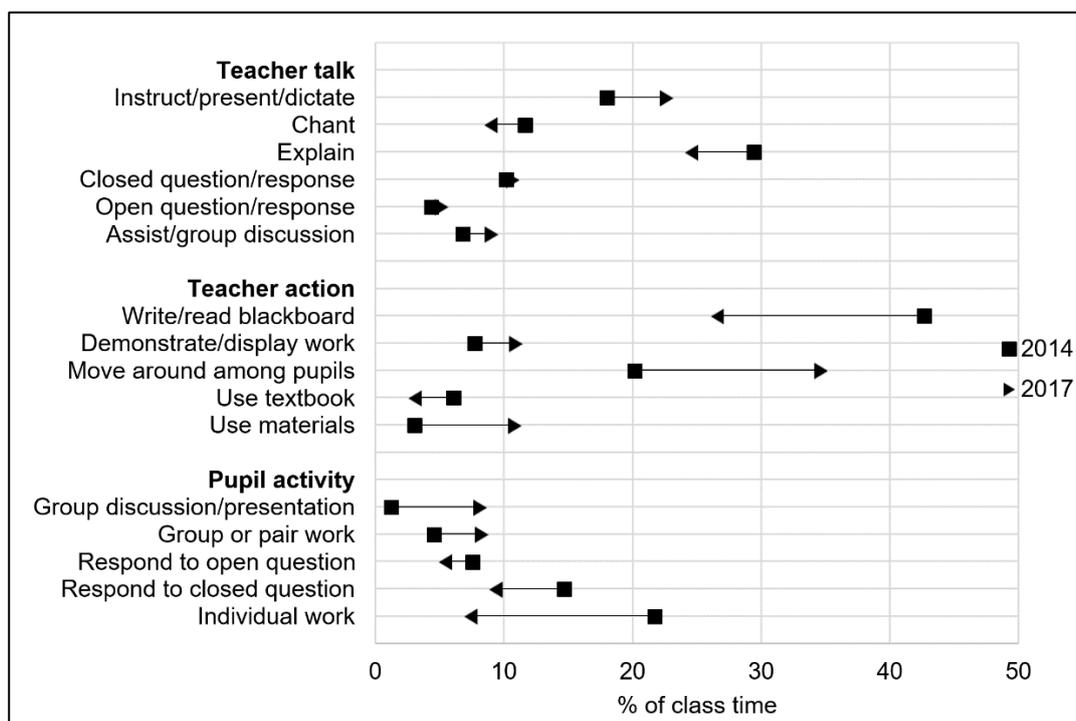
⁵⁹ The minimum score is zero and the maximum score is three for each interval; for each teacher the sum of the scores for all observed intervals is rescaled to have a total score between zero and one.

Figure 6.5: Teacher effectiveness inside the classroom at baseline and endline



By endline the lesson time spent writing on or reading from the blackboard had declined significantly. Teachers in treatment schools spent 27% of the lesson time either writing on or reading from the blackboard, compared to 42% at baseline (Figure 6.6). While the majority of teachers were observed to use participatory teaching methods during the qualitative research, and spoke about these techniques, many also relied heavily on the blackboard. Some teachers spent the majority of the lessons observed by the qualitative research team, writing work on the blackboard while pupils were asked to copy from the board.

Figure 6.6. Change in teacher behaviour in schools where teachers have had TDP training



The sample is the 251 teachers in treatment schools who were observed at both baseline and endline.

Teachers in treatment schools also spent significantly less lesson time chanting at endline (9%) than at baseline (12%). According to teachers and SBMC members who were interviewed by the qualitative research team, the use of chanting has been reduced.

Before we thought that it was all about chanting, as the teacher talks, the pupils repeat. We used to think that this was the most effective way of learning. But this programme showed us that grouping of children [helps them to] learn better and it helps them to develop social skills, develop a child's confidence, it brings about competition between the children so now our teachers do a lot of pairing and pairing activities, grouping and individual. (SBMC member, Jigawa)

Since baseline, the proportion of lesson time teachers in treatment schools spend assisting pupils working in groups or joining group discussions increased significantly, from 7% to 9%, and teachers moved around the classroom much more, for 35% of the lesson time compared to 20% at baseline. In order to facilitate learning, and in line with creating an inclusive and participatory classroom, in the qualitative interviews teachers reported grouping pupils in the classroom. Teachers noted that group work 'simplifies teaching' (teacher, Jigawa); allows stronger pupils to help weaker pupils, especially when pupils have missed a previous lesson; and also encourages pupils to share knowledge and ask questions of their peers. This is perceived to be especially helpful for shy pupils as 'sometimes they also don't feel very free to ask the teacher' (teacher, Jigawa). Similarly, a teacher in Jigawa noted that group work is used 'because the pupils don't like to ask questions but in a group, they learn and ask their colleagues to explain better'. However, teachers used different seating arrangements with about half of the teachers arranging pupils in groups, usually by gender, and others allowing pupils to be seated in rows.⁶⁰

Another major change is the increase in the time teachers use improvised materials while teaching, which is something TDP is trying to encourage. At endline, this was done 11% of the lesson time, compared to 3% of the time at baseline (see Section 6.2.5 for more findings).

The changes in the teaching practices discussed above were all significantly larger in treatment schools than in control schools, suggesting they are at least partly related to TDP, which seeks to train teachers to use more effective practices in the classroom.

Treatment teachers are generally aware of TDP's child-centred approach to teaching and appear to understand the benefits of this for pupil learning. Teachers noted that employing this type of teaching engages and keeps pupils attention, and allows the teacher to determine whether pupils understand and correct mistakes. Teachers did not necessarily see the more child-centred approach as requiring more energy from them. One teacher (Katsina) referred to their older method, centred around lecturing, as the "complex method" of teaching, and recognised that pupils do not always understand the content introduced in this way. This teacher felt that the more demonstrative method learnt during TDP training ensures that pupils understand and remember the content of the lesson. A head teacher in Jigawa explains how teachers employing the child-centred approach no longer have to do all the work of teaching themselves:

If you are to observe [any person that attended the cluster training] in the class, you will see a clear difference. The person that didn't go will go directly to the blackboard and do their lesson successfully without involving the pupil. [However], we are now taught to involve the pupils in the lesson because we are now using a child-centred approach, which is for the children to do everything themselves, just that you will be guiding them, check from group to group to see what they are doing. Unlike before where I would just stand in front of the blackboard and continue my lessons until I finish without going round to see what the children are doing and will not include them in the lesson. (head teacher, Jigawa)

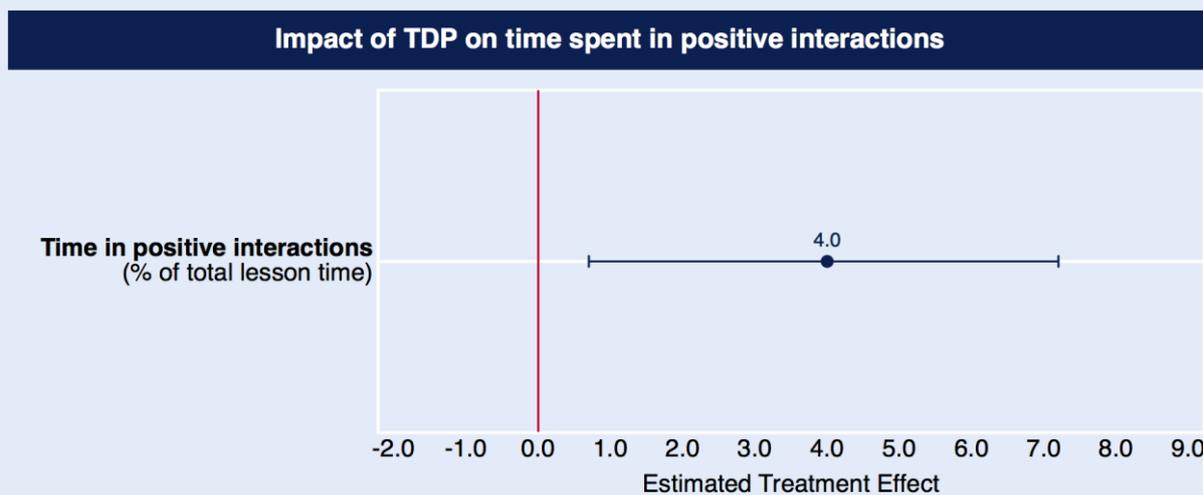
⁶⁰ In cases where tables and benches are nailed to the floor, it would be impossible for pupils to be seated in any other way.

Impact Box 1: Positive impact of TDP on time teachers involve pupils in positive interactions

The figure below shows the estimated effect of TDP on the time teachers spent involving pupils in positive interactions, measured during classroom observations at endline. It compares the percentage of positive interaction in class between teachers who did receive TDP training to those who did not receive TDP training at endline, controlling for any confounding factors, so that this difference can be interpreted as the effect of TDP intervention.

For how to read this chart: see p. 10

The figure shows the point estimate (represented with a small circle) and its confidence interval (represented with the blue line).



Source: Impact Evaluation baseline and endline classroom observations and surveys.
Note: Point estimates correspond to the estimates of the Local Average Treatment Effect (LATE) obtained with Two Stage Least Squares methods over baseline and endline survey data. The estimations control for baseline values, as well as further relevant characteristics. 95% confidence intervals plotted. N = 443.
For a complete description of the estimation methods, please refer to Volume II of this report.

Positive impact of TDP on time teachers involve pupils in positive interactions

The comparison of teachers receiving the TDP intervention and teachers not receiving it reveals a significant impact of the training: there is strong evidence that the programme has increased the time that teachers spend in positive interactions with pupils by about four percentage points. The results are statistically significant, as can be seen in the figure above, since the confidence intervals for the indicators do not overlap with zero (indicated with the red line in the graph above).

Extensive robustness checks with alternative statistical models confirm this evidence of a positive impact of TDP on this indicator.

Some pupils have also recognised the changes in pedagogy and said that lessons are now more enjoyable.

The two case studies in Box 7 illustrate how two teachers appeared to be actively trying to move towards conducting lessons that are inclusive and participatory, with the teacher in Zamfara doing this less effectively, largely due to pupil attendance problems, the use of multi-grade teaching, and the lack of classroom resources (see Chapter 4). These examples demonstrate that although knowledge of best practice may be quite high across schools, many teachers are likely to need additional support to effectively convert this into practice.

Box 7: Case studies of lessons in Katsina and Zamfara

Katsina LGA 2 – Primary 6 mathematics class

The research team observed a 45-minute mathematics lesson taught by a male teacher. Pupils were grouped around desks according to gender.

The lesson began with the teacher explaining the topic, after which pupils were given example problems to solve. The teacher asked them to work in groups using cardboard paper, which he had purchased, to solve equations from the board, while the teacher moved from group to group to ensure that pupils were participating. Pupils were then asked to feed back their answers by electing a representative to present their answer on the board. Finally, the teacher held a competition between the groups where pupils were asked to solve sets of questions on the board while they were helped and encouraged by the rest of their group. Pupils who solved the problems correctly were praised and the rest of the class clapped for them.

An interview with the teacher after the observation indicated that the teacher used group work to facilitate participation and to check pupils understood, and used questions and answers coupled with board work to ensure that he did not dominate the lesson as he prefers pupils to provide the answers. Finally, he used praise to encourage pupils, especially shy pupils, to participate in the lesson.

Zamfara LGA 1 – Primary 5 and 6 English class

The research team selected the first lesson of the day, a double English period, for the lesson observation in this school in Zamfara. However, the lesson started an hour and 15 minutes late, as the teacher spent a lot of time mobilising pupils to come to class, and lasted only 38 minutes. The class comprised both Primary 5 and Primary 6 pupils, as the school only has two classrooms and therefore multi-grade teaching is common.

Pupils were seated in rows on the floor and the teacher used the lesson to teach them a story. The teacher wrote the short story on the blackboard, misspelling some words, read it to the pupils in English, and asked the pupils to copy down the story. He subsequently explained the story to the class in Hausa. In order to make the lesson more participatory, the teacher also asked pupils to sing and dance as a demonstration of what happened in the story.

For the remainder of the lesson, the teacher picked some words from the story and asked pupils to spell them, as well as asking pupils to point to certain words on the board. However, pupils struggled to point to the correct word – in one instance, the teacher asked a pupil to point to the word ‘father’ but the pupils pointed to the word ‘washed’ on the board.

The lesson was dominated by blackboard work and the use of closed questions and the teacher did not bring any materials to the class. The lesson finished without a summary and pupils were not given homework.

6.2.2 Lesson preparation and teacher practices at the end of lessons

Close to half of treatment teachers (46%) reported having gained skills in lesson planning from the TDP training. Most teachers interviewed by the qualitative research team said they prepared for lessons either at home or during free periods at school using the lesson plan and Trainer in the Pocket videos provided by TDP; as one TF in Jigawa put it, this allows them to ‘imitate the teachers that they have watched [in the video], then [put it into] practice in their classes’. In general, teachers reported lesson preparation to take 5–15 minutes. In some cases, however, teachers noted that lesson preparation could take a longer, up to 25 minutes, if the teacher had to find appropriate materials for the lesson. However, teachers also face situations where they are unable to prepare for a lesson, such as when spontaneously asked to cover for colleagues who are absent. During one observation, the English teacher was asked to teach Primary 5 English but protested that he only had the Primary 4 lesson plan and was unprepared. Additionally, in Zamfara, one teacher noted that they did not always have time to prepare as ‘we are just five teachers and we take all the classes’.

Teachers seem to rely on the TDP lesson plans as a tool for preparation, and cite them as one of the most preferred materials provided by TDP. Among the treatment teachers and head teachers who teach, 76% considered the TDP lessons plans appropriate given lesson length and 85% that they are appropriate considering the national curricula. But there is inadequate and variable access to TDP lesson plans: 76–78% of treatment teachers had access to English and mathematics lesson plans, while only 38% had access to science and technology lesson plans. This is despite these teachers belonging to the TDP Cohort 1A (see Chapter 3), who should all have received TDP lesson plans. Of the treatment teachers who have access to TDP lessons plans, essentially all had used them.

When it comes to teachers' practices at the end of lessons, the proportions of teachers summarising the day's lesson (48%) and revisiting the lesson's objectives (16%) remained similarly low at endline. But the proportion of teachers who gave pupils homework increased significantly, from 20% at baseline to 28% at endline, and this change is significantly larger for treatment than control teachers, suggesting it may be related to the TDP training.

6.2.3 Creating a positive classroom environment

TDP training supports teachers to create a more positive classroom climate (see section 3.3). From both classroom observations and teacher interviews, there is evidence that there has indeed been a shift in teacher language to create a more positive climate. Praise was used more frequently than reprimands in 91% of the quantitative classroom observations in treatment schools, and this was a significant increase from 77% at baseline. The use of praise was also commonly observed during the qualitative classroom observations. Pupils were praised for giving the right answer in class either verbally or by clapping: 'if the teacher writes something and asks who understand [and] if a pupil stands up and gets it right, the class claps for him' (pupil, Zamfara). This shift in language extends to the way in which teachers correct pupils' mistakes. Teachers did not reprimand or shame pupils for getting wrong answers during the lesson observations but rather elicited answers from other pupils or provided the answer themselves. In Katsina, one of the teachers noted that 'another thing I do is, I don't put zero or cancel their assignment when they are wrong, I only correct them, show them how to it and they will go and do it correctly and come back'. Both of these techniques contribute to a positive learning environment for pupils.

The training has enhanced teacher–pupil relations. We have learned to accept mistakes and wrong answers from the pupils. By rejecting and scolding, you are harming the self-esteem of the pupils. But the training has exposed us to better ways of handling such situations, resulting in better teacher–pupil relationships, so the training is useful frankly. (Teacher, Jigawa)

However, pupils' responses indicated that a less positive classroom environment was still found in some schools. In two of the schools visited by the qualitative research team there were reports of corporal punishment. Nigerian law does not explicitly prohibit corporal punishment in schools, although the government has stated that the Child Rights Act prohibits such punishments (Global Initiative to End All Corporal Punishment of Children, 2018). Corporal punishment in schools has been associated with worse learning outcomes in several contexts (Gershoff, 2017; Ogando Portela and Pells, 2015).

6.2.4 Language of instruction

At endline 54% of observed treatment teachers used both English and Hausa when teaching Primary 1–3 lessons (for more see Chapter 4). That such a large proportion of teachers used both languages when teaching the lower grades is surprising given that nearly all pupils' home language is Hausa; the national policy on the language of instruction for Primary 1–3 is to use Hausa; and teachers' low English language skills. The use of English is likely to reflect the fact that most textbooks are in English, and a belief among teachers that English should be used. This practice may not be beneficial for pupil learning, as a mismatch between pupils' language at home and the language of instruction is a major barrier to early learning.

For the observed Primary 4–6 lessons, 75% of treatment teachers used both English and Hausa and only 1.5% used English alone. While teachers are generally aware that they should be teaching in English from Primary 4, they emphasised the use of Hausa to ensure pupils understand the lesson given pupils' limited English language skills. This preference for teaching in Hausa is also due to low levels of English knowledge among teachers. This finding underlines the need to raise teachers' and pupils' English language skills up to the required levels in these schools if English is to be effective as a language of instruction.

6.2.5 Changes in the use of teaching aids and materials in the classroom

Many teachers mentioned in the qualitative interviews preparing materials as part of their lesson preparation. According to teachers and head teachers, some of the materials were supplied by TDP and other programmes, while on occasion, teachers said that they bought their own materials.

Pupils are happy to learn whenever teaching aids are used during the lessons but some lessons require instructional materials that teachers cannot afford to buy and the school has no money to make such provisions. Teachers can only sacrifice to buy materials that will not cost them more than 50 naira and probably 100 naira. In [the] past, before TDP intervention teachers had no knowledge on [the] use of teaching aids to teach. (Teacher, Jigawa)

In general, teaching materials and aids are brought to each class rather than being kept in each classroom or displayed on the walls because materials cannot be securely stored in classrooms (see Chapter 4). Teachers cited different motivations for using materials including that they facilitate group work; they engage pupils and enable participation; and they make teaching easier and save time writing on the board. Pupils have also noticed the difference and commented in Zamfara that 'not only do [the teachers] come with books but with teaching aids such as pictures to paste on the wall for better understanding'.

Teachers and pupils noted that where materials were not available for the lesson, they would improvise with low-cost materials or bring no-cost improvised materials such as sticks and stones for use as counters.

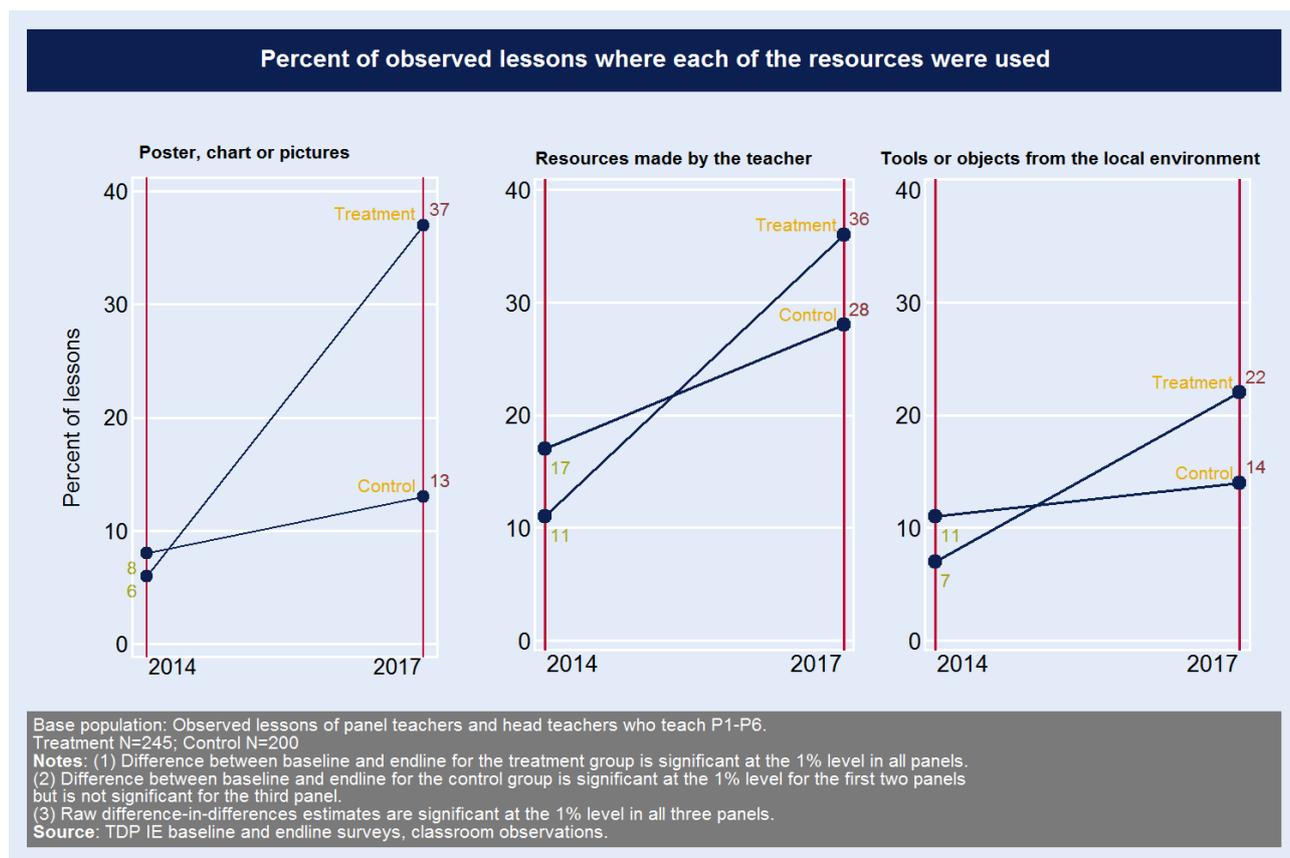
When teaching the pupils, for example cylinder and cone, I learned that [...] I can use cardboard paper to make the shapes and bring it to the pupils and also ask the pupils to make the shapes with the cardboard paper. (Teacher, Katsina)

When it comes to the use of resources during lessons, there have been significant positive changes in both treatment and control schools. These changes are significantly larger in treatment schools, which may be at least partly related to the TDP training and TDP materials being made available to schools, including posters (see Chapter 3). At endline, teachers used posters, charts, or pictures during 37% of the observed lessons in treatment schools and in 13% of control schools (Figure 6.7). The use of resources made by the teacher, for example, flash cards and hand-outs, was observed in 36% of the lessons in treatment schools and in 28% of lessons in the control schools. Tools or objects from the local environment were used in 22% of lessons in treatment schools and in 14% of lessons in control schools.

When it comes to certain TDP materials, their availability in the observed classrooms in the sample treatment schools is very low. For instance, TDP posters for different subjects were present only in 3–13% and TDP flash cards in 25% of the observed classrooms. But when these TDP materials were present in the classroom, the vast majority of teachers used them – 93% used the flash cards and 73% used a TDP poster for the subject taught.

This suggests that part of the problem is the inability to store materials in classrooms; they are instead being stored in head teachers' offices. However, as teachers typically have access to the head teacher's office it is not clear why more teachers do not collect materials to use in the classroom. To increase the use of TDP materials in the classroom may therefore require a solution that makes materials even more accessible to teachers, possibly in the form of storage that clearly organises different materials.

Figure 6.7: Teachers' use of classroom resources during lessons at baseline and endline



The vast majority of the treatment teachers have access to the TDP videos on teaching methods (93%) and audio materials for use in the classroom (93%). Among the teachers who did not have access to the videos and audio, the main reasons given were that they had not been given to them and that they could not play them on their mobile phones.

In the qualitative research, most teachers and head teachers noted that they found the audio-visual teaching aids, such as the audio clips and videos, phone and amplifier provided by TDP to be useful inside the classroom, and recounted using them during lessons in a variety of ways. For example, they used the phone to show pupils images of nouns with which they were unfamiliar, such as 'lion' or 'tiger', and also to play videos to pupils by connecting the handset to the amplifier. Furthermore, teachers enjoyed using the audio-visual materials as these helped to keep pupils' attention and are useful for ensuring that pupils hear the correct pronunciation of English words.

However, the qualitative research team did not observe any teachers use TDP audio-visual materials during the lesson observations, and during the 247 lessons observed as part of the quantitative survey only three treatment teachers used audio. Taken together, this strongly implies that the audio materials produced by TDP for use in the classroom are currently not being used. One possible reason is that across the states, teachers face difficulties using the amplifier due to broken batteries and problems charging the device. This is supported by the quantitative survey finding that although most of the treatment schools (93%) have a TDP amplifier, only 48% of these are working. The main reasons for the amplifiers not working are that they cannot be charged (71%) and that they are faulty (25%). To enable teachers to use the audio and video materials would require a solution that allows amplifiers to be charged and ensures that the financial means and technical support to repair faulty ones are available.

6.2.6 Loss of instructional time and teacher absence

The amount of instructional time affects how much pupil learning can take place during a lesson (Robinson, Lloyd, and Rowe, 2008). But there are substantial losses of instructional time in many developing countries, including Nigeria (World Bank, 2018). A recent study that estimates the loss of instructional time taking teacher absenteeism and the amount of time spent teaching into account, finds that 30% of instructional time was lost in primary schools in four states in Nigeria (Bold *et al.*, 2017).⁶¹ In Jigawa, Katsina, and Zamfara, the main observed reasons for the loss of instructional time are:⁶²

- Lessons being shorter than the required length;
- Teacher school absenteeism; and
- Teacher classroom absenteeism.

Once teachers (and pupils) are in the classroom, there may be a further loss of instructional time as teachers may not actually be teaching; this, however, is not measured by this impact evaluation.⁶³ Regardless of the reasons, losses in instructional time reduce the opportunity for pupils to learn, with negative effects on their learning levels.

Loss of instructional time due to shortened lessons

In observations for this evaluation, many lessons were shorter than the expected length of 35 minutes for Primary 1–3 and 35–45 minutes for Primary 4–6. Teachers in treatment schools tended to teach particularly short lessons; over half of the observed lessons were shorter than 30 minutes and 8% were under 15 minutes. This may be due to the presence of the observer and teachers attempting to follow lesson plan activities rather than teaching their normal lessons. However, it also points to an apparent lack of adherence to a fixed timetable (which would ensure all lessons are of the standard length).

Teachers' absence from school

At endline, the average daily teacher absence from school during the previous five working days is 26% in treatment schools and 30% in control schools, based on school records. This is roughly in line with the sample teachers' self-reported absenteeism from school during the last five working days, which is 37% in treatment schools and 38% in control schools. The high school absenteeism rates imply a substantial loss of instructional time for pupils, regardless of why teachers are absent. This will undermine any effect of TDP on teacher effectiveness and thereby on pupil learning levels.

The evaluation does not find any significant impact of TDP on teacher absenteeism (Impact Box 2). Absenteeism has increased significantly since baseline in both treatment and control schools, and at a similar rate. Absenteeism does not appear to vary with teacher characteristics such as experience, age, or qualifications, and neither is there a significant relationship with regular salary payment or excessive workload (based on teachers' own interview responses).

The main reasons given by the treatment teachers for their absence during the last five days are: own or family illness (57%); social or religious obligations (14%); training (7%); collecting their salary (5%); and engaging in other income-generating activities (4%). That attending social or religious obligations and engaging in other income-generating activities are common reasons for teachers' absence fits with the

⁶¹ Anambra, Bauchi, Ekiti, and Niger states.

⁶² School closures may also lead to losses of instructional time but the endline research did not collect data on this.

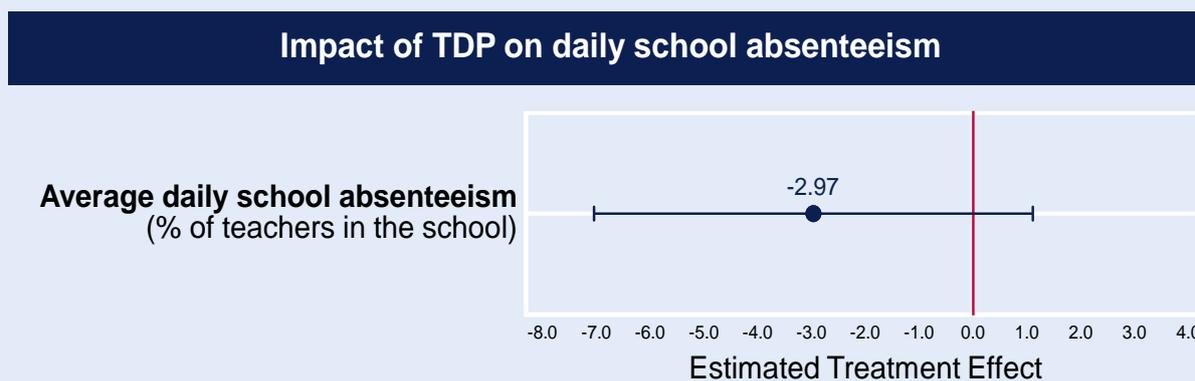
⁶³ Bold *et al.* (2017) estimate that 18% of lost instructional time is due to teachers not teaching when in the classroom.

qualitative research findings indicating that traditional gatherings and family ceremonies are deemed important, and that some teachers find it hard to make ends meet (see Sections 4.2 and 6.4).⁶⁴

Impact Box 2: Impact of TDP on average daily teacher absenteeism from school

The second measure of teacher effectiveness is the average daily teacher absence from school. This is a school-level indicator, defined as the average percentage of teachers who teach Primary 1–6 (but excluding teachers who teach only religious studies) absent in any given school over the last five working days.⁶⁵

The figure below shows the impact on this indicator attributable to TDP, comparing schools where TDP was implemented to schools where it was not implemented.



Source: Impact Evaluation baseline and endline surveys.

Note: Point estimates correspond to the estimates of the Local Average Treatment Effect (LATE) obtained with Two Stage Least Squares methods over baseline and endline survey data.

95% confidence intervals plotted. N= 305.

For a complete description of the estimation methods, please refer to Volume II of this report.

No impact of TDP on teacher absence from school

The impact evaluation does not detect significant differences between schools that received TDP and schools that did not receive TDP that could be attributed to TDP in terms of average daily school absenteeism. Although the impact coefficient is negative (as expected), this difference is statistically indistinguishable from zero. This is visible in the figure above, where the confidence intervals associated with the indicator overlap with zero.

The results remain unchanged over a range of specifications and estimation strategies. These robustness checks can be found in Volume II of this report.

The factors that prevent teachers from attending regularly are varied and depend on the teacher's environment. In Zamfara, participants in the qualitative research tended to attribute teacher absenteeism to financial constraints and economic hardship. The distance to school is a critical driver of absence, where teachers do not have the funds for transport or access to a vehicle. Teachers report relying on community member contributions and often resort to walking to school. This affects rural schools even more, as teachers often live in larger towns nearby, and not in the rural communities. 'Therefore [...] we have to ask for assistance every morning so as to make it to school and after school we also seek assistance in order to get back to our families' (teacher, Zamfara). A head teacher in Katsina suggested that some teachers are

⁶⁴ The proportion of teachers reporting this as the reason for absence is much higher in Zamfara than in Jigawa and Katsina, which is consistent with the qualitative research finding that teachers in Zamfara have lower salaries and are more affected by poverty.

⁶⁵ For the sample schools, on average, 10% of teachers teach only religious studies.

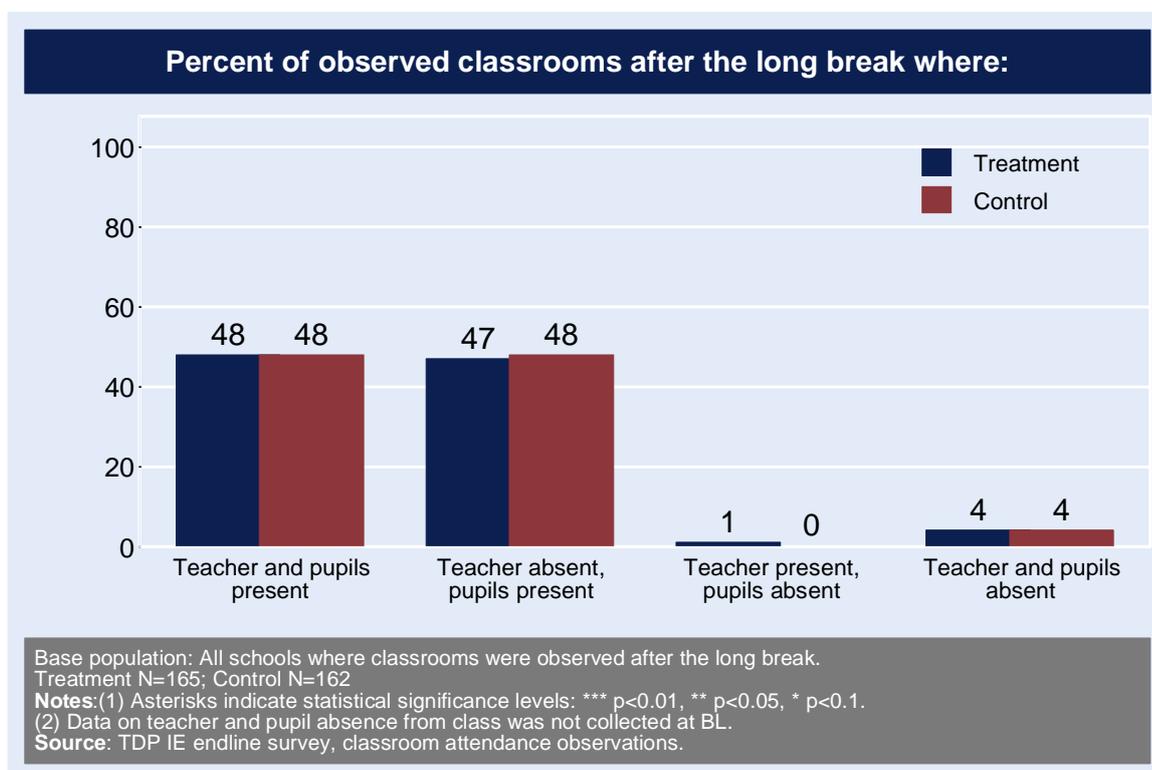
habitually absent because they do not understand the importance of their job, while others are only absent for genuine reasons, such as illness or personal emergencies.

Teachers' absence from class

The endline quantitative survey measured teacher and pupil classroom attendance for Primary 1–6. All classrooms in each sample school were visited after the roll call in the morning and again after the long break to check if teachers and pupils were present.

One finding stands out. Teachers were absent from class in 54% of the lessons after the roll call and from 48% of the classes after the long break, while pupils were sitting in the classrooms (Figure 6.8).⁶⁶ That teacher absence is lower after the long break could be because of teachers arriving late at the school in the morning and therefore missing the class after roll call but not the class after the long break. It is also likely to reflect shortages of teachers in many schools (see Section 4.5). Still, teachers' class absence rate is extremely high, and even if some teachers left the classroom only temporarily, means there is a major loss of instructional time.

Figure 6.8: Teacher and pupil class attendance at endline



In the quantitative observation, no pupils were present in less than 5% of classrooms. However, qualitative observations and interviews suggested that pupil absence after the long break could be a problem in some schools (see Chapter 4 for more on pupil attendance).⁶⁷

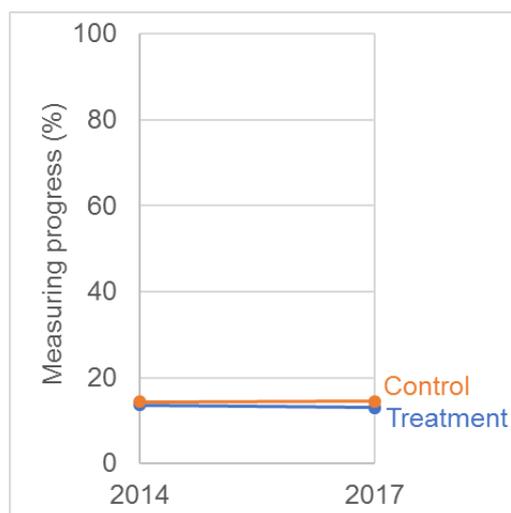
⁶⁶ Attendance was observed 15 minutes after the end of the long morning break. The teacher class absence rate is somewhat higher for Primary 1 and Primary 2 than for other the grades. For comparison, a study for four states (Anambra, Bauchi, Ekiti, and Niger) in Nigeria found that 26% of primary school classrooms had pupils but no teacher in them (Bold et al., 2017)

⁶⁷ The 4% of classrooms observed with neither pupils or teachers in the quantitative study may understate the true issue of pupil non-attendance – for example, if head teachers told the research team that those rooms were not in use, or if classes were sharing a room. The quantitative observation also did not attempt to count what proportion of the enrolled pupils in each class was present, only whether any pupils were present or not.

6.2.7 Teachers' ability to monitor pupils' progress

The TDNA (see Section 6.1) includes a section on monitoring pupils' progress. This includes tasks such as completing a table of pupils' test scores, making a graph of boys' and girls' progress, and correcting a letter written in English. Teachers have not improved in either treatment or control schools since baseline on this measure, and their performance remains extremely low, with only 14% of questions answered correctly and no teacher achieving a 'sufficient knowledge' level (over 75%). As the questions involve English comprehension and writing, and basic mathematics to calculate pupil scores or make a graph, it may be that teachers' lack of subject knowledge prevents them from being able to answer these questions. Nevertheless, it suggests that teachers lack the ability to use tools such as a table of test results to track pupils' progress over time and identify those who are not learning.

Figure 6.9: Teachers have difficulty monitoring pupils' progress



6.3 Teacher motivation and interaction between teachers

For this evaluation, 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 pupils. The TDP theory of change argues that TDP materials, training and support can improve teacher motivation by raising teacher self-esteem (see McCormick, 2013; EDOREN, 2014). The evaluation framework elaborates on this mechanism, suggesting that teachers' motivation is increased as teachers feel more effective and see their pupils' learning outcomes improve.

Motivation is difficult to measure quantitatively. It is examined here by looking at the pattern of responses when teachers are asked how strongly they agree with a number of statements. The statements concerned their willingness to expend effort, their perception of their ability to effect change, the importance of their profession, and their commitment to teaching. The resulting scales measure two dimensions of motivation. The first, which is referred to as 'commitment', relates to the effort teachers say they are willing to put in and the importance of teaching as a profession, but also to their satisfaction in their jobs. The second, which is called 'enthusiasm', relates to their enthusiasm for teaching the group of pupils who attend their classes.⁶⁸ Chapter 8, Volume II, provides more detail on the motivation scale and the conceptual basis and calculation of these two dimensions.

⁶⁸ Being based on teachers' own responses, these scales are potentially affected by response biases, and in particular teachers who have received support may feel pressure to say they are now more motivated or effective. This should be kept in mind when interpreting the following results.

Teachers' commitment had increased significantly over time in both treatment and control schools (by about 0.6 standard deviations from baseline), suggesting that teachers may have a greater sense of commitment or attach greater importance to the teaching profession now than in 2014. There was no change, however, in levels of enthusiasm. There was also no difference between TDP treatment and control schools on either indicator of motivation. This suggests that there may be wider trends affecting teacher motivation in the three states.

The assumption underlying the programme's theory of change, that teachers' improved pedagogy, resulting from TDP training and support, would lead to greater levels of motivation, is not supported. There may be other factors, such as salaries, difficult working conditions, and a continued inability to bring about noticeably better learning outcomes, which still prevent teachers from having a sense of their own effectiveness, which might in turn make them more motivated. The absence of an effect of the programme on motivation may also help to explain the lack of impact on teacher absence. In interviews, many teachers did report that training improved their confidence in the classroom, but this appears not to have resulted in changes in measured motivation.

Do teachers trust each other, work well together, and support each other? Another key factor that may underpin teachers' motivation, as well as facilitating transfers of learning among teachers in a school, is the quality of interactions between teachers. This was also measured by asking teachers if they agreed with a number of statements, such as 'I have teachers that I consider my friends at my school'. The quality of teacher interaction appears to have improved in both control and treatment schools since 2014 (by around 0.5 standard deviations). However, the TDP intervention does not appear to have affected the quality of teacher interactions.

6.4 Factors that affect teacher motivation levels

Teacher motivation is multi-faceted and can manifest itself in different ways. As noted above, teacher absence from school and from the classroom are serious issues, but according to participants in this research, reflect practical constraints in many cases rather than low motivation. Observed behaviour by some teachers also points towards high levels of commitment to their roles and to ensuring that children learn. For example, some teachers spent time before lessons mobilising pupils to come to school from the communities. Teachers report using some of their own salary to purchase teaching or learning materials when parental contributions are insufficient. This is evident across all states, even in Zamfara, where teachers struggle to make ends meet. 'Yet I squeeze out of little salary and buy school needs such as chalk, scheme of work, writing pen and markers for flash cards [which] are all bought out of our income' (teacher, Zamfara).

Similarly, there is evidence that teachers understand their profession as a learning profession and make an effort to improve their teaching methods in order to help their pupils. Teachers enjoyed improving their thematic and methodological knowledge: 'it is just like when you are in a room with a dim lamp and then the electric bulb is brought, of course it will be brighter', says one teacher, referring to the newly introduced TDP methods. Some teachers ranked the learning and researching aspects of their job as the most critical motivational driver. Teachers appear to be intrinsically motivated to attempt to use the methods and materials provided by TDP.⁶⁹

One of the things that encourage[s] me is actually the training we received like teaching was simplified through the grouping of pupils once they are grouped it is easier for you and the pupils enjoy it. The fact that when I teach and the pupils understand is a form of encouragement and this was made possible by the training I received. By putting into action what you learn during the

⁶⁹ Lesson observations and school support visits might lead to compliance, but a large number of teachers and SBMC members report seeing progress in pupils' understanding; teachers attribute this to the new methods, which indicates a genuine application.

training the pupils will follow your teaching. There [are] also teaching aids that you can use to easily teach. Your happiest moment as a teacher is when you teach and those you are teaching are understanding what you are teaching. This encourages me to come and teach. (Teacher, Jigawa)

6.4.1 Salaries and promotion

Two extrinsic reasons commonly cited for low teacher motivation in Nigeria are low salaries, in particular in comparison to the salaries received by other civil servants, and long payment delays in some states (Humphreys and Crawford, 2015; Rai *et al.*, 2017). Although low teacher salaries and late payments relate to federal and state-level governance and are not within the control of TDP, they can influence programme success.

Among sample teachers, most said that they had always received their salary on time in the last school year, but around 13% of treatment and 9% of control teachers always or usually received their salary late. There were marked differences by state; in Zamfara, only 42% of teachers received their salary on time. Nearly all teachers in Jigawa and Katsina, but only 68% of teachers in Zamfara, reported receiving the correct amounts for their last three salary payments. Teachers in Zamfara, in qualitative interviews, reported receiving the teacher minimum salary and reported incidents of delays. They alluded to taking out loans or selling assets to make ends meet.

Teachers in Zamfara reportedly struggled with constrained attention, cognitive capacity, and motivation, due to their economic situation. Teacher poverty was acknowledged widely by head teachers and community members in Zamfara, and to a lesser extent in Katsina. A teacher in Zamfara says:

[O]nly when you are comfortable are you able to teach properly, but in a situation where you are not [financially] comfortable there is no magic that would make you teach well, because one is not at peace. We all have family to cater for and provide for them, so whenever salary is delayed it would affect us and our family and by implication the pupils would be affected as well. (Teacher, Zamfara)

While the financial situation of teachers in Zamfara seems particularly dire, challenges in making ends meet are known to teachers in all states (though perhaps to a lesser extent). A teacher in Jigawa states: ‘Well, sometimes in life [...] you may wake up without food to eat, fuel for work, so this is one of the discouragements in coming to school.’ Salary problems both created direct hardship for teachers, and also demotivated them by suggesting a lack of recognition of the importance of their role by government.

As with payment, promotions are perceived as a mechanism of recognition by the government. Across all states, teachers emphasised the lack of and delay in promotions, and felt that there may be unfair mechanisms of selection. ‘It is not the hard working teachers that get the promotion, but the ones with connections’ (teacher, Katsina). Promotions in practice do not appear to be tied to experience, performance, or professional development.

6.4.2 Pupils’ presence and learning

Many teachers perceived pupils’ attendance to be among the most critical drivers of their motivation. Teachers appear to understand the difficult economic conditions and attitudes of pupils’ households, and their motivation is affected by the extent to which they can see pupils in their classrooms and learning. Teachers in all states report that they are motivated by the learning, performance, and progress of pupils. This is related to their perceived self-efficacy and effectiveness in the classroom. Teachers enjoy watching the pupils understand and participate in a subject (teacher, Katsina). A teacher in Zamfara says: ‘if a pupil stands up to correct the teacher [...] that will be a thing of joy for the teacher to see that one of the pupils noticed an error and stood up to correct him. That shows that some understand all what you teach them.’

Teachers see the TDP pedagogy and materials as an opportunity to ‘maximise their opportunities’ (teacher, Katsina) to transfer knowledge to the pupils. TDP allows teachers to ‘improve their interaction with pupils’ (teacher, Zamfara) and ‘engage in activities and guide pupils better’ (teacher, Katsina). In addition, teachers state that improved pupil understanding is directly attributable to the application of learned methods and the new teaching material of TDP. Two teachers also suggest that there has been a change in the relationship with the pupils, allowing them to feel freer with the children (teacher, Zamfara).

The qualitative research also finds evidence for a wider intrinsic motivation. A number of teachers reported being motivated by ‘being part of the children’s paths’, ‘producing leaders of tomorrow’, and ‘installing knowledge and values in children’ (teachers in Jigawa, Zamfara, and Katsina). Teachers perceive their impact on pupils’ lives to be substantial, as they frequently state that ‘children taught by a teacher will remember the teacher’, that the families of pupils value the teacher’s contribution to raising their children, and that primary education is the foundation of all other education of a pupil in life (teachers in all three states).

6.4.3 Overcrowded classrooms

Teachers’ workloads can affect their motivation levels, in particular if they feel overwhelmed. Approximately one-third of the sample teachers consider their workload excessive. The main reasons given by these teachers are a shortage of teachers at the school, having too many classes to teach, too many pupils in their classes, and too many administrative and clerical duties.

The lack of teachers and increased enrolment rates outlined in the Chapter 4 are detrimental to motivation as they reduce teachers’ effectiveness, as well as depleting their resources, exacerbated by a lack of official recognition of their efforts. A teacher in Katsina states: ‘We don’t have enough teachers in this school. We have six blocks with nine classrooms and only four teachers are managing the school. It is obvious that there is a problem. Whatever you do you must still see a class unattended. This is really discouraging.’

6.4.4 Community perception

The perception of the community can drive or inhibit the motivation to teach. This is best understood in contrast to the perception teachers have of their role and standing in society:

I can still remember the times when the village head has none other than the school teacher to be his guide and secretary [...] the teacher is a reasonable person in the society and people often go to them for advice. (Teacher, Zamfara)

Similar statements have been made by teachers in several schools visited by the qualitative research team. This is a stark contrast to the perception and attitude towards Western education (and consequently teachers) in rural contexts (see Chapter 4). In Katsina, a teacher summarises this challenge, using an example of a teacher from an urban area transferring to a rural school:

If the new transferred teacher is an impatient teacher the attitude of the community members would discourage him and destroy his passion for teaching. He would become disinterested with the school and the community, because he has to do [the] extra work of tracking the pupils from their home and talking and begging, [so] the parents send their children to school. (Teacher, Katsina)

In certain communities the teaching profession seems to be respected widely. This is mentioned as affecting teacher motivation:

There is another thing that motivates me to come and teach, and it is the members of the community. The community was not aware of the value of education before but now they are

beginning to appreciate the value of education. Since they know the value, I should also put in my best and play a role. The SBMC has done a lot in this regard by creating awareness about the importance of education. The SBMC is making contribution to education, so I should also contribute.
(Teacher, Katsina)

One frequently occurring event, linked to the attendance of pupils and community perception of education, seems to be particularly detrimental to teachers' motivation levels. Parents let SBMC members, religious or traditional authorities convince them to enrol their children in school. After a while, these pupils are gradually withdrawn by their parents. As discussed above, teachers feel that there is a window of opportunity to transfer knowledge and establish enthusiasm for learning in pupils. When the children are withdrawn, teachers feel as if they were not able to convince pupils and parents about the value of education and the 'benefits of learning'. Their value offering of Western education is insufficient, which to some teachers is a direct reflection on their performance (teachers, Zamfara and Katsina).

In some communities children do not like to go to school and parents are unable to supervise them. Some teachers report seeing this as a signal that their teaching and the school offering is not sufficiently attractive. As mentioned above, TDP can increase the perceived value of the school both among parents and children through materials and a pedagogic method effecting improved learning. Across all three states, SBMC members perceived improvements in pupils' learning. This is reflected in several pupil statements as well as in accounts of changes towards a 'friendly' school environment of several pupils (pupil and head teacher, Katsina).

A teacher in Jigawa summarises this:

Sometimes you see like here in the village when parents send their kids to school they hang around sometimes we will have to go and chase them to come to school sometimes especially the mothers will allow their kids to go end up missing important lessons. They may miss the first and the last lessons and end up not learning what they are supposed to learn. (Teacher, Jigawa)

Neat uniforms and cleanliness of pupils appear to be motivational factors for some teachers, especially in schools where more pressing issues such as pupil absence have been resolved to some extent, and is taken by teachers to signal parents' appreciation for the importance of school and the profession of teaching.

6.4.5 Support

Support through school leadership was not mentioned often, when teachers were asked directly about motivational and demotivational factors. A good relationship with the head teacher was perceived as positive, but as not affecting teacher motivation greatly. However, peer support was mentioned as having a direct impact on teacher motivation. As noted above, the quality of interaction between teachers appears to have improved in both control and treatment schools, which should lead to improved motivation.

6.4.6 Religion

Religion was mentioned as a driver of teacher motivation across all three states. A teacher in Jigawa states: 'From the religious point of view once you are employed to work then you have to discharge your responsibilities diligently and cannot refuse to come and work. When you are being paid. This also motivates.' Many teachers also mentioned heavenly rewards for fulfilling the profession of a teacher as contributing to their motivation.

6.5 Summary: teachers

Table 6.1 summarises the key evaluation questions and assumptions in the TDP evaluation framework that are addressed in this chapter, along with an assessment of whether assumptions are satisfied and the strength of the evidence. TDP has improved the types of teaching method teachers use, but has had no effect on their subject knowledge in English, mathematics, or science, their ability to monitor pupils' progress, or their absence from school. Teachers report that the TDP materials and lesson plans are appropriate and useful, and there is evidence that the training has been sufficient to instil a better understanding of pedagogy in teachers. However, the programme is still hindered by inadequate classroom materials, especially textbooks, and teachers appear to make limited use of the technology provided through TDP. Evidence on teachers' motivation is less clear: teachers appear to be highly motivated to help pupils learn, and commitment to their jobs appears to have improved over time, but common external circumstances such as irregular salary payments, pupils not learning, and overcrowded classrooms may undermine teachers' motivation.

Table 6.1: Summary of evaluation questions and evidence for them

Evaluation question / assumption	Assumption satisfied	Evidence strength
Has TDP improved teacher subject knowledge and does this objective address the needs, priorities, and constraints of primary teachers in northern Nigeria (effectiveness and relevance)?		
Percentage change in average teacher raw scores on TDNA for English, mathematics, and science and technology (Effe-4/Re-3).	No	Strong
Has TDP improved teacher effectiveness inside and outside the classroom (effectiveness)?		
Percentage change in time teacher involves pupils in positive interaction during lesson (Effe-1/Re-2).	Yes	Strong
Percentage change in average daily teacher absence from school (Effe-2).	No	Strong
Percentage change in teacher scores on ability to assess and monitor pupil academic progress (Effe-3/Effe-6).	No	Strong
Does this approach address the needs, priorities, and constraints of primary teachers in northern Nigeria (relevance)?		
Teachers being able to use TDP technology (Re-11).	No	Strong
What factors facilitated or inhibited TDP's achievement of its outcomes?		
Adequate classroom materials (blackboards, books, desks, etc.) are available (Im-13/Re-17).	No	Strong
Proportion of teachers reporting that they use the TDP materials in the classroom; that the TDP lesson plans are appropriate given lesson length; and that the TDP lesson plans are appropriate given the curriculum (Effe-12).	Yes	Strong
Teachers can access and use the TDP audio-visual materials (Effe-23).	No	Strong
2.5 days' training, monthly cluster meetings, and the support visits and mentoring are sufficient to instil new pedagogical knowledge in teachers (Effe-24).	Yes	Strong
Selected teachers being sufficiently intrinsically motivated to turn improved knowledge into improved effectiveness (Effe-13).	Mixed	Medium
Selected teachers being sufficiently extrinsically motivated to apply their new knowledge (Effe-14)	Mixed	Medium

Abbreviations (Effe-4 etc.) refer to questions or assumptions listed in the evaluation framework; see Annex A, Volume II.

7 Pupils

Ultimately, the aim of TDP is to improve the learning levels of children in primary schools. The evaluation assessed children in Primary 3 in 2014, and assessed the same children again in 2017, by which point most were in Primary 6.

This section first presents results from the assessments in English, mathematics, and science. It examines differences in learning by state, wealth, sex and teacher characteristics. To shed further light on these findings, it then presents findings on children's perceptions of their learning experiences.

7.1 How much are pupils learning?

Pupils were assessed in English, mathematics, and science. The analysis of these test results uses item response theory, a technique which simultaneously estimates the difficulty level of each question that appeared in the test and the ability level of each pupil in the sample. By taking account of differences in difficulty between questions, it produces more meaningful results than simply calculating the percentage score on the test. The resulting scores are expressed as a number of standard deviations. The standard deviation is a measure of the total dispersion in pupils' test scores, and can serve as a unit of measurement for making comparisons between the treatment and control groups.

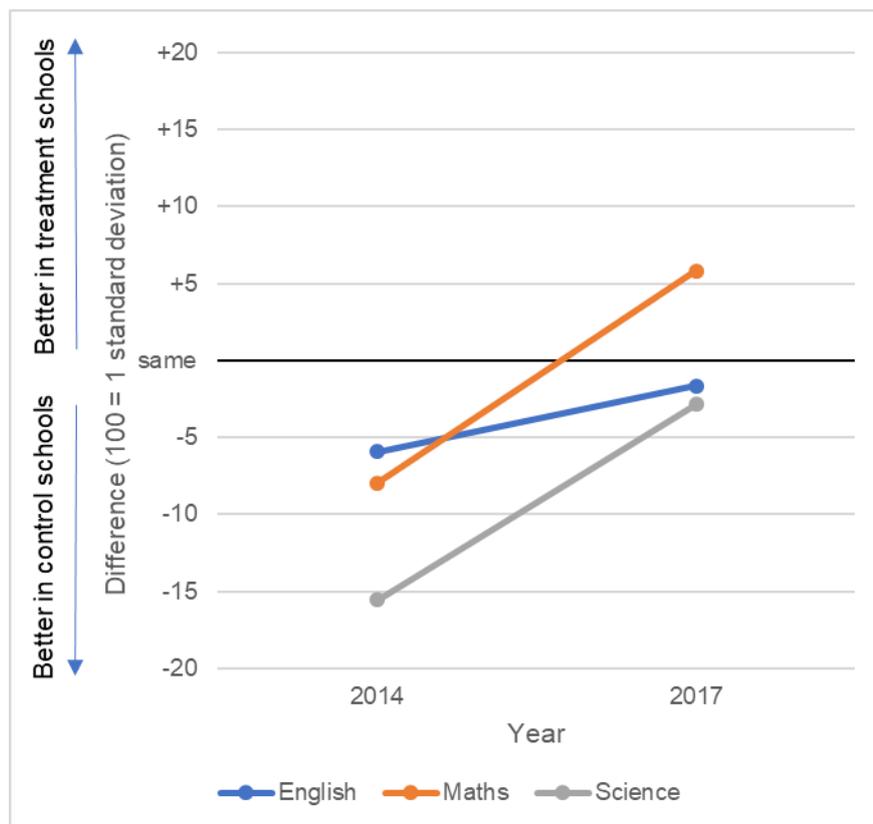
The tests used in 2017 were different from those used in 2014. The baseline test focused on children in Primary 3, while the endline test focused on upper primary level material. While some questions overlapped or were similar, other questions differed and focused on more advanced content. This evaluation uses standardised scores as a way of comparing groups at two points in time. It compares the difference between control and treatment schools at baseline with the difference between control and treatment schools at endline.

In 2014, pupils in treatment schools happened to perform slightly worse than those in control schools. In English, pupils performed around 0.06 standard deviations worse than in control schools, in mathematics, 0.08 standard deviations, and in science 0.15 standard deviations (Figure 7.1). These differences were not statistically significant. By 2017, the differences between treatment and control had been reduced, and for mathematics, reversed. The pupils in treatment schools were doing better than those in control schools.

However, the evaluation was not able to conclude that the programme had a positive impact on learning outcomes. First, the change in the treatment-control difference was not statistically significant. Secondly, there was substantial attrition of pupils from the sample (see Volume II). If, for example, lower-performing children dropped out more, and this happened more in treatment than control schools, then the test results would tend to overestimate impact. In order to control for this and other possible selection issues, the analysts explored a number of regression models (Impact Box 3). The results show no significant effect of the TDP intervention on pupils' learning outcomes.

By looking at some selected questions from the tests, it is possible to get a clearer sense of pupils' progress over time (Box 8). In English, pupil in the baseline survey could on average read only one simple English word (such as 'go' or 'sad') in a minute; 87% of them could not read any of the words. Tested on the same set of words three years later, the pupils were now much more able to read simple words. Still, on average, they could read only five to six words, and more than half were still unable to read any of the words. Among those who could read some of the words, they could read around 12 on average. When the test administrator named parts of the body and asked the pupil to point to those parts (nose, toes, knee, and ear), only one in five could do this at baseline, and one in three at endline. When the administrator said some simple words ('face', 'clean') and asked the pupil to identify them from among other words on the page, only around 10% of pupils could do this at baseline, compared to over 50% at endline.

Figure 7.1: Differences in test scores between treatment and control schools in 2014 and 2017



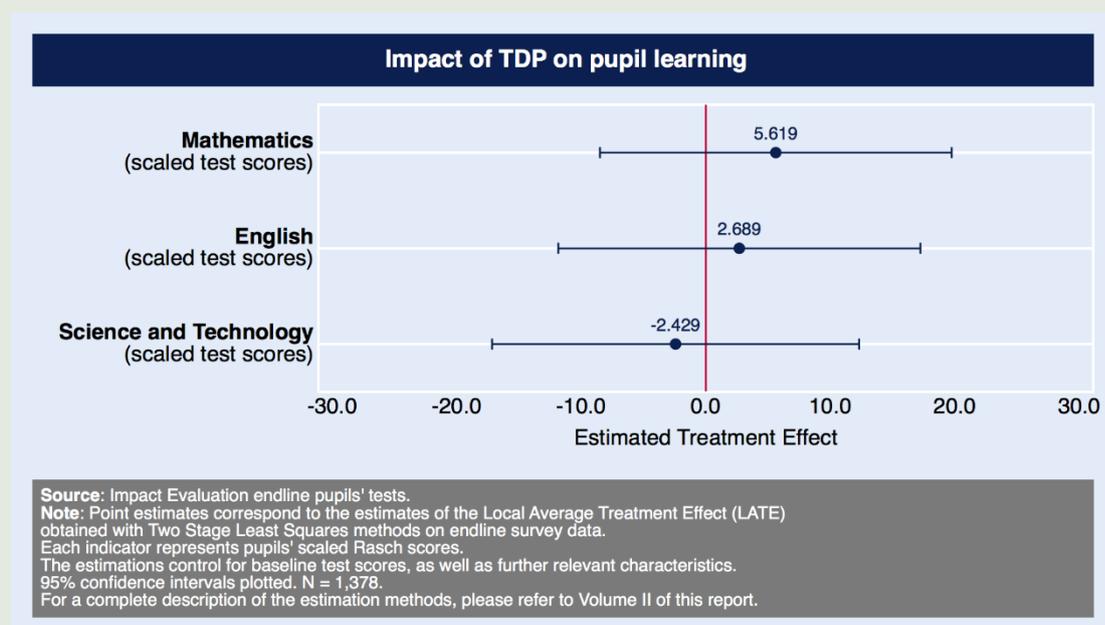
These responses show that, while pupils do learn some English between Primary 3 and Primary 6, their progress is very limited, with around half still unable to read or identify simple words. In mathematics, pupils were asked to add three-digit numbers in their workbooks, without having to ‘carry a digit’ (for example, $234 + 342$). Almost none of the pupils were able to do this in the baseline, but at endline, over 40% of them were.

In science, pupils’ performance at baseline generally appeared to be better than in English or mathematics. Some of the responses, however, suggest that they have made limited additional progress since Primary 3. Asked a series of questions about objects floating in air, over 40% of answers were correct at baseline, compared to around 55% at endline.

New questions added to the endline tests provide further insight into pupils’ progress in learning (Figure 7.2). Only one in four pupils could read a passage and answer at least one comprehension question on it correctly. Most pupils were able to answer several mathematics and science questions correctly, such as filling in three-quarters of a square or identifying that an animal that has feathers and can fly is a bird. Although over 40% could add three-digit numbers when it did not involve carrying a digit, only 8% could do this in a harder sum that did involve carrying a digit (for example, $364 + 163$), and only 5% could correctly multiply 28 by 4. In each of these questions, there was little difference between pupils in TDP intervention schools and control schools.

Impact Box 3. Impact of TDP on pupil learning in English, mathematics, and science

The figure below shows the estimated effect of TDP on pupil learning in English, mathematics, and science, measured through tests administered at endline. It compares the performance of pupils in schools where the programme was implemented to those of pupils in schools where it was not. Performance is expressed using scaled scores for each subject (calculated using item response theory; see Volume II, Chapter 6). An effect of 100 is equal to one standard deviation. The graph below shows the point estimates (with a small blue circle), and their confidence intervals (with the blue line), for the mathematics, English, and science scaled scores.



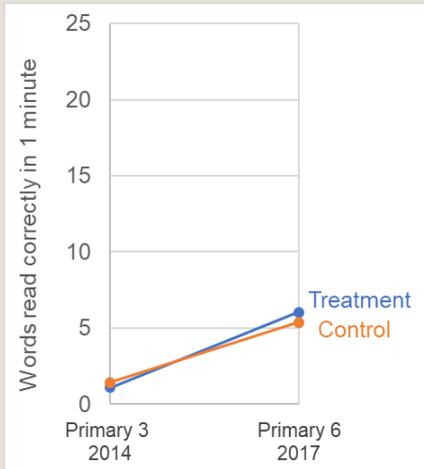
No clear impact on pupils' performance

There is no significant evidence for TDP training having an impact on pupil learning outcomes, irrespective of the subject. The estimation models implemented do not capture robust significant change in the test scores that could be attributed to TDP. This can be seen in the figure above, since confidence intervals for each estimate overlap with zero (indicated with the red line in the graph above).

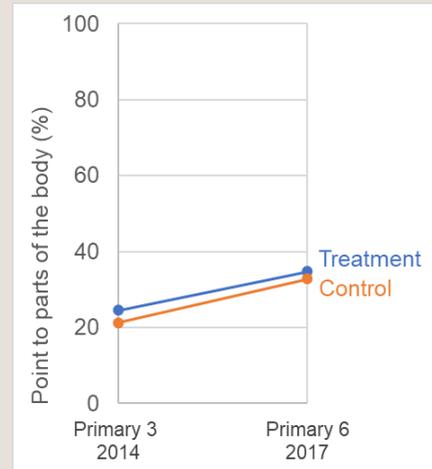
The analysis involved trying a number of different statistical models to fit the data. Some models did suggest a small impact of TDP on pupils' mathematics results. But this impact was not robust to changes in model specification. (The TDP sample was designed with a minimum detectable effect of 0.2 standard deviations, so the evaluation is not able reliably to detect effects below this size.) None of the models found an effect on English or science. Overall, the extensive robustness checks with different statistical models confirmed that there is no evidence of an impact on these indicators.

Box 8: Results in selected test questions

Read some simple English words out loud (*go, sad, up, red, and*) in one minute

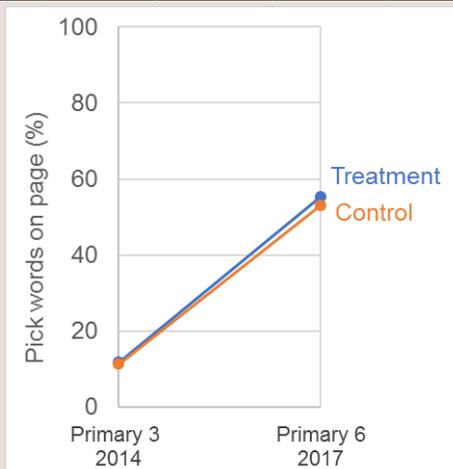


Can point to parts of the body mentioned in English by the administrator (*nose, toes, knee, ear*)

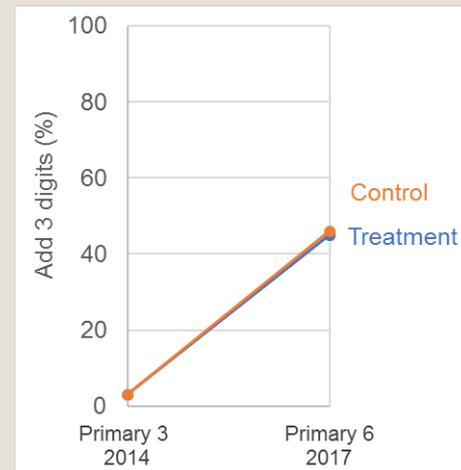


When the administrator says a simple English word (e.g. *face*) the pupil can choose the right word on the page from among five, e.g.

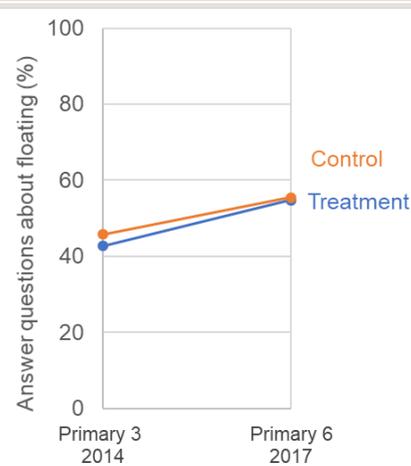
and	face	chair	Frog	fly
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Can add a three-digit number (without carrying, e.g. $234 + 342$)

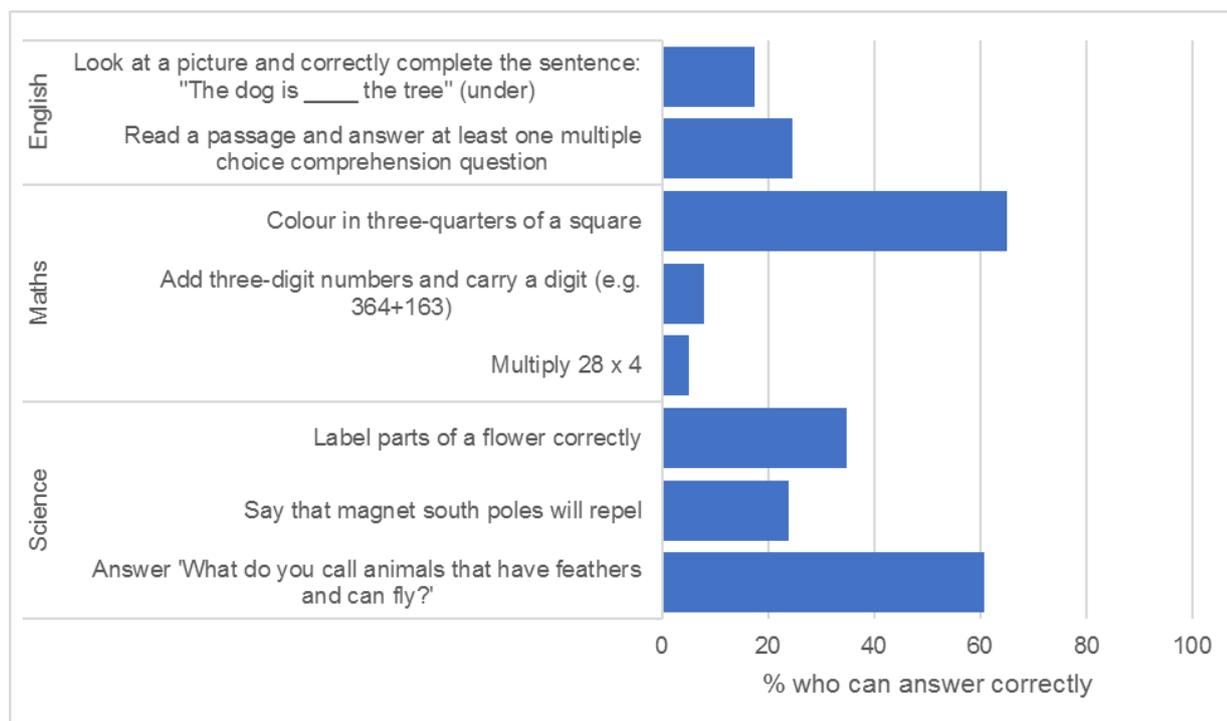


Can answer questions about objects floating in air, with picture stimulus



NB: For simplicity (here and in subsequent charts) the endline pupils are labelled Primary 6, but the sample includes some pupils who remained in Primary 4 or 5 due to grade repetition.

Figure 7.2: Percentage of pupils who can answer selected questions correctly, 2017



7.1.1 Categorising pupils' learning

Pupils' learning can be placed into bands using a learning framework compatible with that used at baseline (see De *et al.*, 2015, and Box 9). In English, at baseline in Primary 3, most pupils were considered pre-literate (Figure 7.3, top panel). By endline (when most were in Primary 6), most are considered to have emerging literacy, meaning that they can carry out tasks such as reading out simple words and choosing a word to complete a sentence. Only around 5% are considered to have functional literacy, meaning for example that they could read a short passage and understand it.

In mathematics, the vast majority of pupils were considered pre-numerate at baseline (Figure 7.3, middle panel). At endline, a large proportion continued to fall into this band, meaning that they could typically recognise numbers and identify differences in weight and volume in a picture, but could not do simple addition or subtraction. The majority were in the emerging band, meaning that they could do simple addition and subtraction, some basic algebra, and recognise two-dimensional shapes. Around 12% had functional numeracy, and were typically able to do items which pupils would be expected to complete at Primary 2 level and above, such as three-digit addition and subtraction, two-digit multiplication, and using a calendar to answer questions about dates.

In science, at baseline there was a large minority of pupils in the pre-science band (Figure 7.3, bottom panel). At endline hardly any pupils remained in this band. Over 80% of pupils had emerging science competency, meaning that they showed some understanding of how to apply scientific concepts to everyday processes. Around 20% reached the functional band, meaning that they could explain everyday phenomena with understanding.

In short, most pupils in Primary 6 have the knowledge expected in English, mathematics or science for pupils at around Primary 2 level. The evaluation does not find any impact of TDP on the proportion of pupils who fell into the lowest and highest learning bands (Impact Box 4).

Box 9: Learning framework

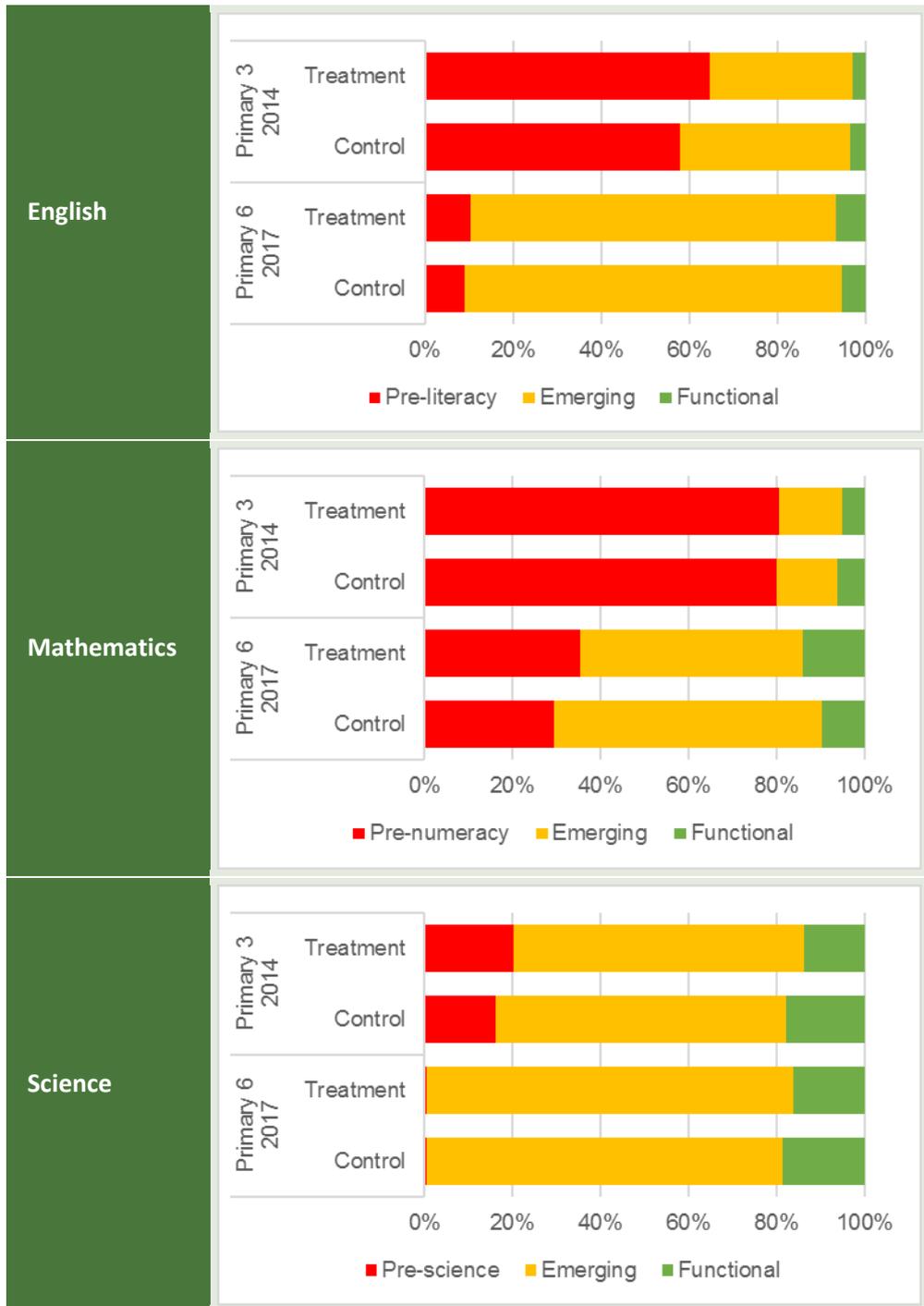
The test developed for the endline evaluation applies some items from the original test used at baseline for pupils in Primary 3. It aims to assess skills taught across the range of grades from Primary 1–5. However, the framework for interpreting the test results remains similar to that used at baseline. The original framework was developed with reference to the Primary 1 and 2 curriculum set by National Education Resource Development Council/UBEC.

In each subject, pupils are classed as pre-literacy, pre-numeracy, or pre-science if they have at most basic skills expected in Primary 1. Emerging skills in each subject are in line with those expected to be acquired during Primary 1. Pupils in the functional band are typically able to complete items in line with Primary 2, although some in this band can also complete harder items associated with Primary 3, 4, and 5.⁷⁰ The table below describes tasks that can typically be done by pupils in each band.

Band	English	Mathematics	Science
Pre-literacy / pre-numeracy / pre-science	Answers simple oral questions using complete sentences; points to some body parts based on oral cues; orally names everyday objects based on picture cues.	Recognises numbers; performs simple quantity discrimination tasks; identifies differences in weight and volume from pictures.	Orally describes or recognises basic properties such as size, taste, weight, length, and colour of everyday objects.
Emerging	Reads some short words; identifies some simple written words after hearing them; spells some short words correctly; answers simple questions in full sentence based on visual stimuli; completes some sentences by choosing a grammatically correct word.	Addition/subtraction sums of one/two digits; uses simple algebra; recognises basic two-dimensional shapes.	Understands interactions, everyday physical, and chemical processes, or effects that have been experienced using an abstract scientific concept.
Functional (basic)	Writes answers to oral questions using some grammar conventions; writes everyday items in plural; reads or listens to a passage (one paragraph) and answers some questions on it correctly.	Performs two-/three-digit addition/subtraction sums, money sums for amounts or change up to NGN 500, one-digit multiplication sums; can use a calendar to answer questions about dates.	Understands and orally explains processes or effects in terms of a non-observable property or an abstract science concept.

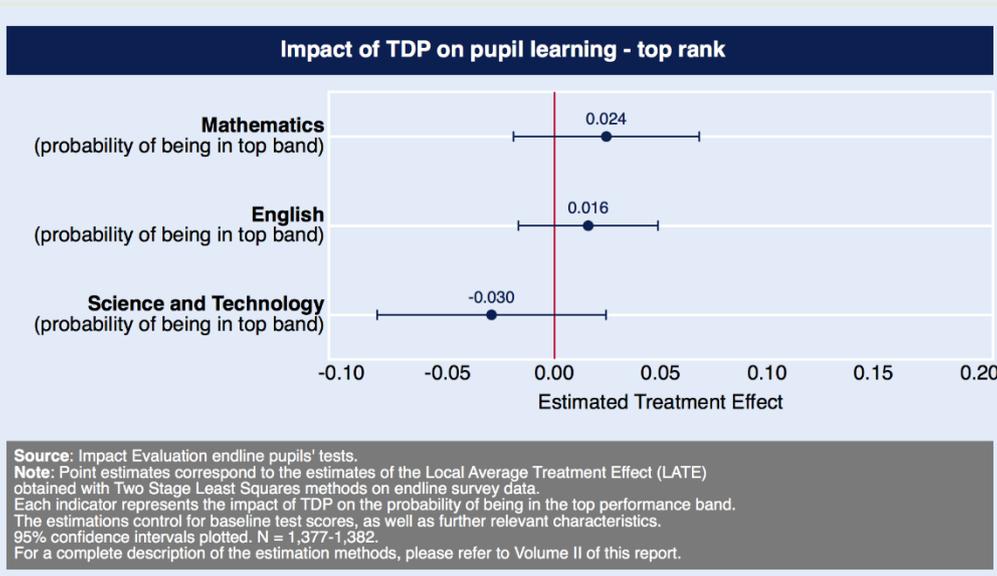
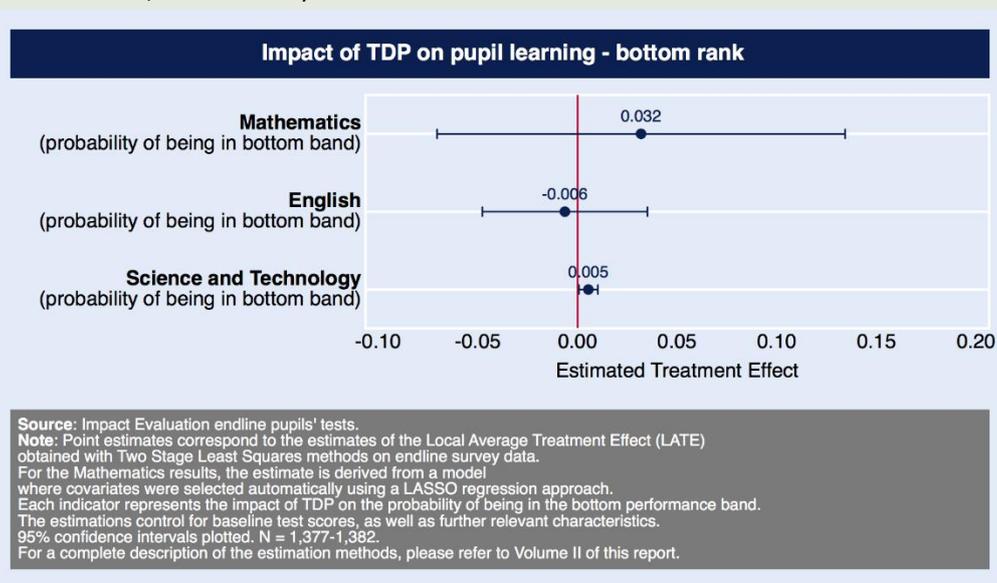
⁷⁰ In the baseline report (De et al., 2015), the top band was referred to as ‘basic’. In this report, the top band is referred to as ‘functional’, reflecting the greater difficulty of some of the items in the test. However, the typical pupil in this band was only able to complete items on a par with what would be expected in Primary 2. Also in the baseline report, the science categories are referred to as ‘observes’, ‘understands’, and ‘explains with understanding’. This report uses the ‘pre-’, emerging and functional categories for consistency with the other subjects.

Figure 7.3: Proportion of pupils in each learning band, for English, mathematics and science



Impact Box 4. Impact of TDP on the proportion of pupils in the bottom and in the top performance bands of mathematics, English, and science

The figures below show the estimated effect of TDP on the proportion of pupils in the bottom and in the top performance bands of English, mathematics, and science, measured through the tests administered at endline. They compare the proportion of pupils either in the bottom or in the top rank of the test scores, for pupils in the schools where teachers received TDP training and schools where teachers did not receive TDP training. The graphs below show the point estimate (represented with a small circle) and its confidence interval (represented with the blue line) for TDP effects in each subject (English, mathematics, and science).



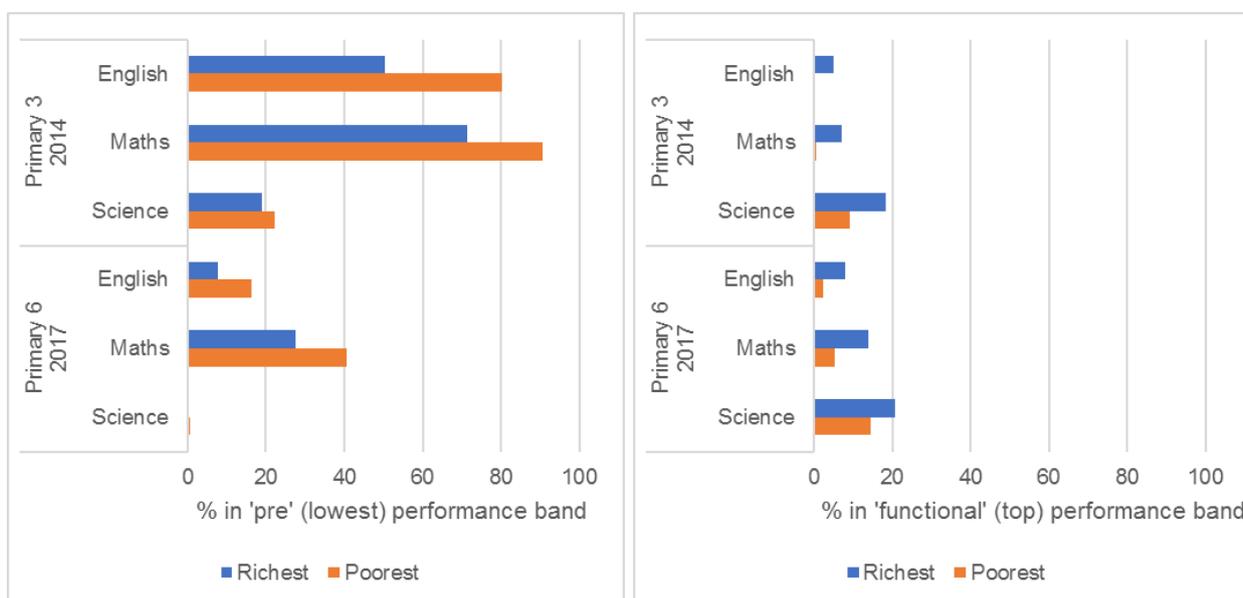
No impact for English, mathematics, or science

There is no evidence for TDP intervention having an impact on the proportion of pupils in either the bottom or the top rank for mathematics, English, and science. This can be seen in both figures above, since the confidence intervals for the indicators overlap with zero (indicated with the red line in the graph above). It should be noted that some estimation models used in the context of this evaluation point to limited evidence for adverse effects of TDP on the proportion of pupils in the bottom performance band in mathematics, but that these results do not hold up to scrutiny when assessed using the full set of robustness checks implemented as part of this analysis. The conclusion is that TDP did not affect the proportion of pupils in the bottom performance band in mathematics.

7.2 Differences in pupils' learning by wealth, state, gender, and teacher characteristics

As at baseline, there remain large differences in learning outcome by wealth in the evaluation sample (Figure 7.4). Pupils from the poorest backgrounds are twice as likely as those from the wealthiest households to be pre-literate in Primary 6 (16% in the poorest quintile compared to 8% in the wealthiest quintile), and one-third as likely to be in the functional category for English. Similar differences can be seen in mathematics and science. Among the poorest Primary 6 pupils, only 2% achieve the functional level in English, 5% in mathematics, and 15% in science. Performance gaps appear to have narrowed between Primary 3 and Primary 6, which suggests that it is in the earliest grades that wealth-based learning gaps open.⁷¹

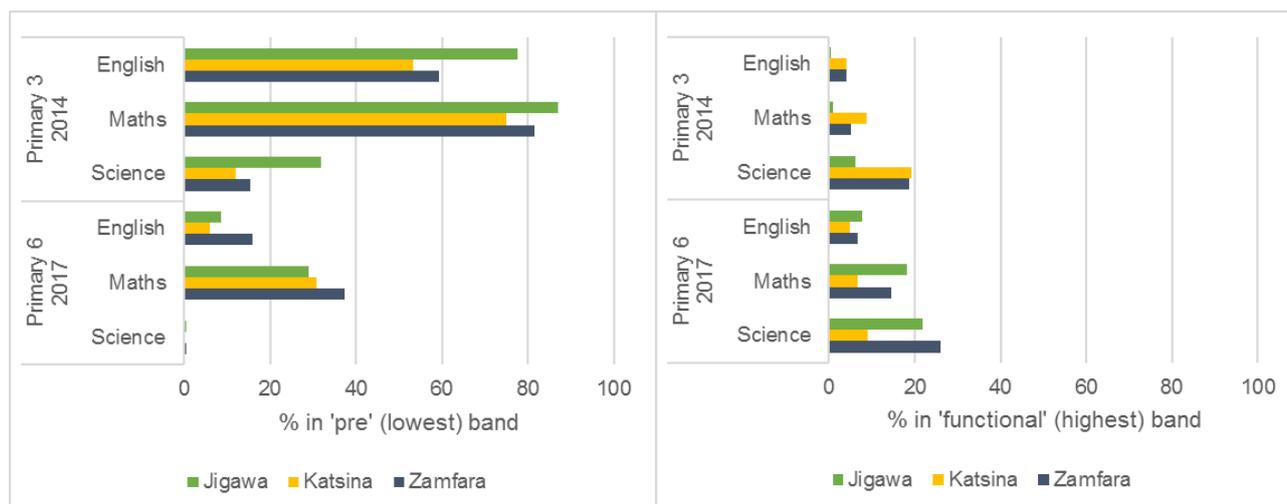
Figure 7.4: Proportion of pupils reaching lowest and highest learning benchmarks by wealth (wealthiest 20% vs. poorest 20% in the sample) in 2014 and 2017



There were differences in pupils' test performance between states (Figure 7.5). Pupils in Katsina performed better than those in Jigawa or Katsina at baseline, but by endline pupils in Jigawa were performing best in English and mathematics, and pupils in Zamfara were performing best in science. Overall there was more improvement over time among pupils in Jigawa than in the other two states; improvements were smallest in Katsina. Impact analysis also suggests some differences between the states. In Jigawa, there was a positive impact of TDP on average mathematics scores, and in both Jigawa and Katsina, there was a positive impact on the proportion of pupils reaching the highest learning benchmark. However, in science there was no impact in any of the states, and in Zamfara there were signs of negative impact. These results call for further exploration, but could reflect differences in the implementation of TDP and other interventions across the three states.

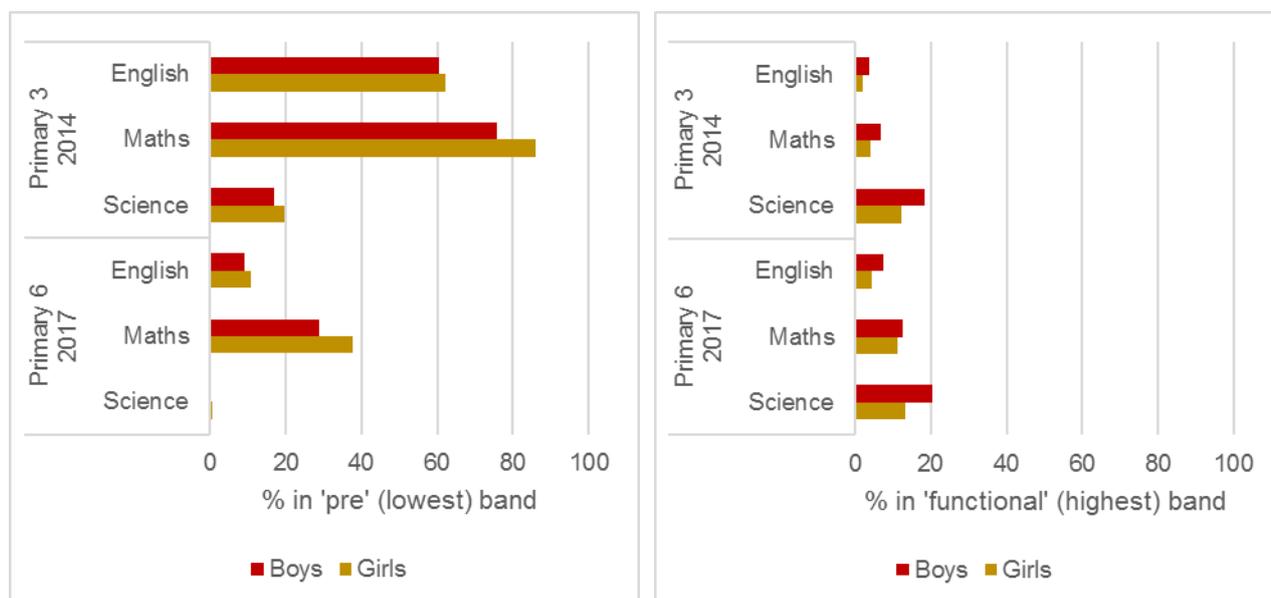
⁷¹ In some other contexts, wealth learning gaps have been found to open up at later grades (e.g., Alcott and Rose, 2017, on India).

Figure 7.5: Proportion of pupils reaching lowest and highest learning bands by state



Boys' learning outcomes are on average higher than girls' in the three states (Figure 7.6). This gender learning gap has persisted between Primary 3 and Primary 6 in all three subjects. As well as being less likely to attend school at all in the three states (see Chapter 4), girls are disadvantaged once in school, possibly due to different household responsibilities, differences in regular attendance (although the household survey results reported in Chapter 4 suggest that girls tend to attend school slightly more regularly than boys), or differences in the attention given by teachers to boys and girls.

Figure 7.6: Proportion of pupils reaching lowest and highest learning bands by gender



Schools where a higher proportion of teachers hold an NCE have higher average pupil scores in English, though not in mathematics or science. The difference in English scores is statistically significant, but not very large in magnitude. Replacing an unqualified with a qualified teacher in an average school is associated with an improvement of around 0.04 standard deviations in English scores. There is evidence for an interaction between the effect of TDP intervention and the proportion of teachers in a school with NCE. In treatment schools, the effect of an additional trained teacher on English and mathematics scores is larger

than in control schools, although the difference is very small in magnitude.⁷² Moreover, even in schools with a high proportion of qualified teachers, treatment effects were still not statistically significant. The average years of experience of teachers in the school is not significantly correlated with test scores, and nor was there any interaction between years of experience and TDP intervention.

7.3 Pupils' experience of their learning

Although the impact estimates do not indicate a change in pupils' learning outcomes (Impact Box 3 and Impact Box 4), pupils, teachers, head teachers and SBMC members in some schools felt that pupils' confidence and motivation had improved, as well as their learning outcomes. In three schools in particular, both pupils and SBMC members spoke about improved pupil learning, linked to more effective teaching, as the most significant change they had experienced in their schools in the past three years.⁷³ SBMC members felt that teaching had improved through grouping and that learning outcomes had improved, albeit from a low base. In Katsina, a member of the TDP team felt that, in general, there had been an improvement in learning outcomes:

I think getting the children to learn how to read and write is one of the achievements because to a large extent now we have children that can read and write in schools where TDP are operating. Also the retention rate in schools where TDP opened is a little bit higher than what it used to be. (TDT, Katsina)

How can this disparity be explained, between perceived improvements and the lack of impact on quantitatively measures pupil test results? It is possible that the qualitative schools were atypical in this respect, or that participants felt compelled to give socially desirable responses. However, it could also reflect teachers' weak ability to monitor and assess pupils' learning (see Section 6.2.7). Their perceptions of improved progress in TDP schools may consequently be inaccurate. Another possibility is that there may have been greater improvements among the lower grades. This evaluation is only able to measure the change among pupils who were in Primary 3 at baseline, and who are in Primary 6 at endline.

Pupils remarked on a change in the school atmosphere created by the type of language used in the classrooms and the way teachers now relate to pupils. As part of TDP's training on classroom management,⁷⁴ teachers complete a number of modules, including classroom language, involving pupils in the lesson, and giving praise in order to create a positive learning climate and motivate children to learn. In quantitative lesson observations, praise was used more than reprimand in three-quarters of classrooms (see Chapter 6). Some pupils reported enjoying teachers' frequent use of praise. For example, pupils in Jigawa (median performing school) reported understanding the head teacher's lessons because 'even if a pupil fails a question, he will make us sing a song to that person'. Similarly, in a school in Zamfara, pupils remembered an English teacher who had engaged pupils and been friendly and they had understood his lessons well. Their favourite teacher was the head teacher, who they said encouraged pupils to ask questions and used group work to engage pupils. Pupils were conscious of change towards a more friendly and encouraging learning environment, and this positively contributed to their experience of the school.

⁷² Based on the interaction term between a treatment variable and the percentage of teachers in the school who have an NCE, in a regression model that also controls for baseline test scores. The coefficient on the interaction term is weakly significant ($p < .01$) for English and mathematics.

⁷³ As part of the qualitative research, the team conducted most significant change exercises with pupils and SBMC members. Respondents were asked, one by one, to tell a story about a significant change that has had occurred in their school in the past three years. After sharing their stories, the group was then asked to decide which story they considered to be the most significant and why.

⁷⁴ See Teacher Guide Part A.

Pupils were also aware of, and appreciated, a move towards more participatory approaches to learning with better use of materials. Pupils in a school in Katsina that was poorly performing at baseline, for example, noted a distinct change in teaching pedagogy – ‘before our teachers only come to class and write on the black board and then write what they write to us and we repeat’, in comparison to now, when they were using posters to ‘demonstrate how to read and write’.⁷⁵ Pupils enjoy using different materials in the classroom, as they are drawn into the lesson, and mentioned enjoying the use of textbooks, posters, flipcharts and markers, flashcards, and the speaker. In classes in which teachers make use of TDP and other materials to include pupils in the lessons, pupils reported that they understood better. For example, in Zamfara (poorly performing school), pupils said that the mathematics teacher used flashcards and counters and that they were now taught in a way that they understand. This was further facilitated using group work, which pupils said they enjoy (Zamfara).

7.4 Summary

Table 7.1 summarises the key evaluation questions and assumptions in the TDP evaluation framework that are addressed in this chapter, along with an assessment of whether assumptions are satisfied and the strength of the evidence. TDP has not, as yet, improved learning outcomes for pupils in TDP schools. The impact of the TDP intervention on English and mathematics scores varies according to the proportion of qualified teachers in a school, but even in schools where most teachers are qualified, there is no significant evidence of a positive impact. The impact of TDP does not appear to vary with the average years of experience of teachers in a school.

Table 7.1: Summary of evaluation questions and evidence for them

Evaluation question / assumption	Assumption satisfied	Evidence strength
Has TDP caused changes in pupil learning in English, mathematics, and science and technology in TDP schools (impact)?		
• Im-1 Has TDP improved learning outcomes for pupils in TDP schools?	No	Strong
• Im-2 Are TDP impacts on pupil learning heterogeneous for teachers with different qualifications and years of experience?	Mixed	Medium

Abbreviations (Im-1, Im-2) refer to questions or assumptions listed in the evaluation framework; see Annex A, Volume II.

⁷⁵ As mentioned in the chapter on teacher effectiveness, it appears that many teachers are still using the blackboard and copy techniques; many teachers were said to come to class with only ‘chalk and duster’ (Zamfara). However, for those pupils who have experienced a change in the way they are taught, they have picked up on and enjoyed child-centred teaching.

8 Sustainability

TDP has attempted to ensure sustainability through technical assistance to relevant agencies and federal and state government departments; and political engagement at federal and state levels. Within Output 1, it has created a cadre of trainers at both state and local government level, and intends to support states to align teacher reforms with the national strategic framework for basic education being developed by UBEC (Grey, 2018). The sustainability of the programme as a whole also depends on its pre-service education activities and the ways in which in-service and pre-service components can complement each other.

A full assessment of the programme's sustainability strategy is beyond the scope of this evaluation. This section, however, relates stakeholders' perceptions on some key questions regarding the programme's Output 1 interventions. It considers stakeholders' views on the sustainability of the intervention as a whole after TDP's funding has ended; of practices learned among individual schools and teachers; and of TDP materials. Finally, it considers stakeholders' views on the willingness of state governments to take over the intervention.

8.1 Is TDP likely to be sustainable once the programme's funding ends?

At endline, TDP programme staff were keen for their efforts to be viewed as in-service reform, not as a separate programme. They stated that TDP did not come with the offer of a new programme but rather with new ways of implementing what is currently being done by the system, in order to reform the system. The programme staff said that this reform was in line with the 2014 National Teacher Education Policy (Federal Ministry of Education, 2014) and so they saw themselves as reforming the system by implementing this policy. Staff were of the opinion that TDP has created a lot of demand through political engagement, capacity building by showing the government what to do, and the evidence that things are working, rather than telling them what to do. In part, this is due to TDP's operating model – where the state-level teams have been flexible to SUBEB's plans and preferences – and in part due to TDP seeking explicit consent from LGAs before conducting activities in treatment schools. At a higher level though, political support for the programme has been variable, with the 2015 general elections reported to have slowed the momentum of the programme down due to a change in leadership at the state level.

This section largely draws on discussions with stakeholders at multiple levels who will be responsible for sustaining the programme in state, in LGAs and in schools once the programme withdraws financial support. In summary, the findings below suggest that staff in schools – head teachers and teachers across all three states – do not have the confidence in the SUBEB sustaining the programme to the same degree and with the same integrity that it has been implemented by the programme itself. These perceptions are in part due to observations that the quality of training sessions and treatment of trainees has declined and on a larger, more significant level, because there is a breakdown in trust between the stakeholders at the school level and those at higher (LGEA, SUBEB) levels concerning broader issues around promotions, payment of salaries, and support to teachers and schools; these issues are explored in earlier chapters as well as in the sections below. It also explores sustained behaviour in school and continued support from TFs and TDTs. Finally, it explores the states' responses to the programme and whether the programme is perceived to be sustainable in each state.

8.1.1 Sustainability of in-service training

As the training model has been rolled out using various sources of funding (SUBEB, UBEC and Global Partnership for Education), states have changed and, in some cases, diluted the training model. In Jigawa, the roll-out of training using SUBEB and Global Partnership for Education funds has involved a much shorter training period and has not included school support visits, which are an essential part of the TDP model. In Katsina, SUBEB funds provided by UBEC were used for training teachers using a separate UBEC cluster

training model, rather than a model based on TDP. By contrast, in Zamfara, the TDP training model was used with some adjustments to remove the provision of the Trainer in the Pocket or SD card materials, to allocate trainers by Area Development Council rather than LGA, and to train some rather than all teachers in the schools (Durrani *et al.*, 2018).

In general, concerns around delayed salaries, teacher transfers and lack of teachers, and lack of resources and support in school made teachers sceptical that the TDP training would be sustained by the SUBEB, in addition to their regular day-to-day duties. This was compounded by the fact that teachers were resentful of how SUBEB treated them during training sessions, and this affected their willingness to participate and their morale. In Katsina, teachers observed delays, a suspension of training, and a general decrease in the quality of materials offered, and hoped that TDP would go back to being managed the way it had been in the past.

No, I am talking about the teachers, the participants, what happened was that after the change from local government to the state, there were dramatic changes. And it was from that time that we noticed dramatic changes. Initially things were normal but immediately after the change we started having delays – first delays in meetings, when a notice for a meeting is sent and you honour the invitation and come for the meeting, you will be told that the meeting is not going to [be held]. Definitely you know the attitude of human beings when you ask them to come back tomorrow they will not come back. Throughout 2014 and 2015 things like this have never happened, they may come late but they will eventually come. (teacher, Katsina)

This sentiment was especially strong in Zamfara.

Interviewer: Can SUBEB continue with it [in-service training sessions]?

Teacher: It can but like I said when they call for cluster meetings or trainings [...] then they should give us at least food or water.

Interviewer: So my question is can they continue or not?

Teacher: They can but it means they will be forcing us to go not because we want to, this is because as the saying goes ‘you can force a donkey to the river but you can’t force it to drink’. So they can force us to go for training but cannot force us to do the work well because they weren’t treating us well too. (Teacher, poorly performing school, Zamfara)

There was a time we went [for a cluster meeting] some of us [who came] down and had to go back because honestly we slept in class. We arranged tables because there was no space in [anonymised] local government, there is no government lodge, no accommodation. (TF, [state anonymised])

In Jigawa, teachers and head teachers were not given food or training allowances at the latest training sessions. They were informed that training was voluntary, ‘but attendance will be taken’. Teachers enjoyed and valued the training sessions greatly but felt that if training sessions were truly voluntary, they would not go as the cost of the training was high and the lack of food and training allowances placed severe financial constraints on them and their families. In Jigawa teachers challenged the quality of training sessions and materials given to them – and do not believe that these will follow the level set by TDP.

8.2 Sustaining individual practice

At school level, teachers and head teachers who viewed the training sessions favourably and were motivated said that they were likely to continue with the skills they learned. So, schools that have received training are likely to continue with this knowledge. Teachers were especially determined to use low-cost

materials, and head teachers stated that they would continue the training to teachers. In one school (in Jigawa), the head teacher planned 30-minute training sessions every week.

What I am saying is the withdrawal or stopping of TDP will not take away these things that teachers are doing and [have] learned. Unless there's an announcement of a new way and these [TDP practices] has been stopped and I don't think this will come in. Besides this there's a website that is given for TDP you can go in and get information here and it is said if you have any question you can send it there and if you need some material like a video you will get it there. Even if TDP withdraws [its programme], this website is there. (Teacher, Katsina)

TFs were positive about the programme's change on teacher's behaviour; however, they were less positive about their role in the future. TFs and TDTs were concerned about the resources and support they would continue to receive after the programme had withdrawn its support from the state. Remuneration for travel was a primary issue raised at endline and TFs did not feel like they would be able to continue monitoring if they did not have the money to travel to schools. Another concern was the continuation of their position as facilitators after TDP.

If they can place the TFs on maybe some allowances that will make them, that will encourage them to go and do the support visits fine and good, but if nothing will be done the TFs will be left with their monthly salary as their primary school teachers because nothing has been changed, they were just removed from primary school teaching and given as desk officer of TDP; so if you want the programme to continue, the TFs should be given some allowance that will allow them to go into the villages. So one of the challenges is if the TFs are not given anything as allowance into the villages they may not go and the primary schools are not inspected so definitely the teachers will not carry on as the programme has started. (TDT, [state anonymised])

TFs were also hesitant to conduct facilitation visits when they had to bear the brunt of angry teachers who had not been reimbursed for the training sessions, or if sessions had not met their expectations. Teachers would either confront them or not entertain them during school visits. If TFs do not feel like they have the support to continue their work and solve problems in school or raise these concerns with senior officers in the LGEA and SUBEB, they are likely to be dissuaded from continuing their role as envisaged by TDP.

8.3 Sustaining use of TDP materials

The idea of low- and no-cost materials introduced by the programme has changed teacher's knowledge on what they can use in the classroom, and it is likely that this knowledge of how to use alternative teaching aids will be sustained. However, the roll-out of mobile phones and subsequently SD cards to all TDP schools could not be sustained as SD cards were distributed only to 'committed' teachers, and distributed based on head teacher demand. Teaching materials and aids such as posters were stored in the head teacher's office (as is discussed in Chapter 4) and since the use of these was limited during the life of the programme, continued use is unlikely to be sustained. Finally, amplifier batteries were found to be dead or not working and repairing amplifiers and handheld tablets that are used by TFs has proved to be difficult due to lack of money and spares, thus rendering them useless.

If you go to the primary school, some primary school teachers cannot afford handset of four thousand, if you give him SD card are you giving him something to use? It may end up not being used if you now call all the primary school teachers that you have given them SD card. (TDT, [state anonymised])

It is also not clear whether SUBEB will continue to support the distribution of teaching aids and materials in schools. Teachers and head teachers who did not have basic teaching materials such as chalk or books considered it unlikely that the SUBEB would be able to continue these new commitments.

8.4 State governments' willingness to continue

Political engagement was a key area identified by TDP for sustainability. Political engagement is needed to ensure that government stakeholders recognise the importance of reforming in-service training and share the programme's vision for an effective school. Teacher training was identified as a priority area for SUBEBs in all three states in which TDP was working, alongside other teacher issues such as the recruitment of unqualified teachers, teacher motivation and attendance and salary payments. TDP has been engaging stakeholders on issues of teacher effectiveness and low subject knowledge, particularly in English. However, within UBEC there were differing views on the impact of TDP. One UBEC respondent said 'States are taking it seriously – they realise the need for training' whereas other more sceptical voices in UBEC felt that some states were not generally willing to prioritise education and ensure teachers were trained; felt that there was lack of political will at state level to continue training; and that 'Education is not their [the states'] priority at all.'

SUBEB staff interviewed at endline, like TFs and TDTs, provided positive feedback about the programme's implementation. Although they complained about timeliness of payments, SUBEB staff said that they considered TDP to have changed teaching practice and the nature of support in schools significantly. However, the SUBEB staff gave mixed views about whether the programme would be sustained. For example in Zamfara, discussions showed that the SUBEB staff were putting in measures to sustain and scale the programme by training and printing and supplying the lesson plans to additional schools, and incorporating aspects of the TDP model into a Teacher Residency Training each year. These materials though were not of the same quality as those distributed by TDP, and training sessions were reported by teachers and head teachers to be poorly organised. Similarly, in Jigawa and Katsina, TDT and TFs were sceptical of the project being sustained to the same degree as it was done during its original implementation by TDP, and shared their hopes of TDP coming back to implement in the states, in one form or another. They were keen that TDP continue implementing the programme in the state – or continue to provide support in some form in the state – either through training or by distributing materials.

As mentioned in the implementation report, the continuation of the reform of teacher training, as envisaged by TDP, is likely to depend on political support, and the chief executive's favour and allocation of budget to the model. It is unclear if political support will be sufficient to sustain the programme.

9 Recommendations and lessons

9.1 Summary of key findings

TDP has rolled out its intervention to include a large number of teachers in schools in extremely difficult circumstances for teaching and learning. As the baseline findings showed, the programme has had to face severe challenges in terms of school infrastructure, materials, management, teachers' subject knowledge, and the types of support available to children at home.

Despite these challenges, it has successfully had a positive and visible impact on the way teachers teach, with substantially less reliance on copying from the blackboard and chanting, and more use of discussion, group work, and other activities that involve children being more active in their own learning. It is greatly appreciated by teachers, head teachers, and community members, many of whom see positive change happening in their schools. Teachers report finding the TDP support and training very useful and that it has increased their self-confidence. Enrolment has increased in TDP schools, although it is not clear if this is a direct result of the programme or part of a larger trend.

This has not translated into an impact on pupils' learning within the three-year period of this evaluation. Learning outcomes in English, mathematics, and science remain very low. Around half of the Primary 6 pupils tested cannot read a single word in English, add two three-digit numbers, or describe how things can float in air or water. There is no difference in pupils' learning outcomes between schools which have benefited from TDP and those which have not.

There are a number of other training and support initiatives in Jigawa, Katsina, and Zamfara which could have had a positive impact on control schools in this evaluation, making it harder to measure the impact of TDP. These other programmes help to explain, for example, modest improvements in pedagogic practices in control schools. However, the poor learning outcomes overall among Primary 6 pupils, and the lack of change in teacher subject knowledge, in both control and treatment schools, would suggest that these other training initiatives have also had limited positive impact. Moreover, the presence of other initiatives is accounted for in this evaluation's analysis of key impact indicators, and so cannot explain the lack of TDP impact.

While the reasons for a lack of impact are complex and are discussed in more detail in relation to the programme's theory of change below, it is useful first to highlight what appear to be the three most important reasons.

First, the main limitation on impact appears to be teachers' own subject knowledge, particularly in English literacy, combined with the fact that written Hausa is rarely used in northern Nigerian schools or textbooks. Teachers appear to have been left badly under-equipped by their own education to deal with a curriculum and materials that rely on written English. Most teachers were not able to complete comprehension questions such as reading a newspaper article and explaining the meaning of selected passages, and on average only answered 20% of English questions correctly. Performance in science was also very weak, but teachers were somewhat more successful in answering mathematics questions, such as correcting a pupil's incorrect calculation.

Second, there are also signs of a serious shortfall in the amount of time that teachers spend teaching in class. On an average day during the survey, around one in four teachers were absent, and on visits to classrooms in the middle of the morning, almost half had pupils waiting with no teacher. TDP had no impact on teachers' absence from school. Teachers' lessons are often shorter than the expected 30–40 minutes. This points to problems with teacher motivation – and in turn, issues around salaries, teachers' other responsibilities, their working conditions, and perhaps the inability to have a positive effect on pupils' learning. In addition, it points to problems with school management, with head teachers both lacking

power to hold teachers to account, and possibly lacking the skills such as record-keeping that would enable them to do so. The positive change in teaching practices due to TDP has not, in itself, been enough to motivate teachers to attend regularly.

Third, not all teachers in the TDP intervention schools had yet been trained. Pupils would have spent some time being taught by the teachers in the first cohort to receive training and support. But they would also have been taught by teachers who had not yet received any training, which would dilute the overall impact. TDP's Reading Programme, which ran for 14 weeks from March/April 2017, had only reached around half of the teachers in the treatment schools by the time of the survey.

The following sections describe how key contextual and intervention factors may have hindered TDP from having an impact on learning outcomes.

9.1.1 Contextual factors hindering TDP impact

As the evaluation framework (EDOREN, 2014) argued, the route from improved subject and pedagogic knowledge, to improved effectiveness in and outside the classroom, to a positive impact on pupils' learning, depends on a set of contextual assumptions being fulfilled. The findings of this evaluation suggest that most of these have not been fulfilled, undermining the programme's route to impact.

- *Children attending school regularly:* Many pupils do not attend regularly and for the full school day, particularly in rural areas and during harvesting seasons.
- *Children have the capacity to learn from improved teaching in the language of instruction:* Many pupils in treatment schools have very limited English literacy by Primary 5 or 6, making it difficult for them to benefit from instruction or materials in English. While teachers often appear to recognise this, and use Hausa to help the pupils understand, most textbooks and materials remain in the English language, and the national policy is to use English as the language of instruction in Primary 4–6.
- *Children receive adequate support for learning at home:* Rates of adult literacy, particularly in English, are low in the three states, and in a recent national household survey, very few parents said that their children received help with homework.
- *Teachers attend class regularly:* In around half of classrooms visited in the middle of the school day, pupils were present but with no teacher. Rates of teacher absence from school are also high and increasing.
- *Class sizes are small enough:* Class sizes are large and growing, with increasing use of multi-grade teaching. Teachers do not have strategies to deal with large class sizes or multi-grade teaching.
- *Adequate classroom materials:* Most classrooms are equipped with a blackboard and chalk, but there are often few textbooks, and many schools have poor infrastructure.
- *Curriculum and materials are appropriate to the language and ability of the pupils:* Most pupils lag far behind curriculum expectations by the end of primary school. Pupils' reading fluency and comprehension in English is extremely limited, so they are unlikely to be able to keep up in other subjects, such as science, when textbooks rely on English as the language of instruction.
- *Selected teachers being sufficiently motivated to apply their new knowledge:* Teachers' commitment to their jobs has improved over time, and many teachers are highly motivated to ensure their pupils learn. But there is a risk of irregular salary payments and lack of promotion opportunities, pupils not learning, and overcrowded classrooms, undermining teachers' motivation.

- *Selected teachers being retained in schools where TDP is operating:* Teacher and head teacher turnover is extremely high. Even where teachers transfer to other TDP schools, their ability to benefit from and use their school-based training is likely to be disrupted by the frequent moves.
- *Selected teachers having the capacity to apply their new knowledge:* Teachers' low subject knowledge – their reading ability in English, in particular – is likely to undermine their capacity to apply their new knowledge about pedagogy.
- *Head teachers being motivated to lead and manage teachers well:* Head teachers were resolute about improving their schools, but many considered their workloads excessive.

The updated theory of change (Annex A) notes an additional key contextual assumption:

- *Head teachers have the autonomy and resources in the current system to exercise leadership and management skills:* Head teachers may be well-placed to support teachers in developing their skills, but many have limited subject knowledge themselves, and they have little power to address key problems, such as teacher shortages and teacher absence from school or from the classroom.

Most of these contextual factors were described in the baseline study (De *et al.*, 2016a) and the formative research (Doyle *et al.*, 2017), and there is little sign of improvement in most of them. Some challenges, such as class sizes, have grown more acute since the baseline. These factors help to explain why the programme has not had the desired impact on learning outcomes. Some of these, such as class sizes, parental support, and infrastructure, are beyond the control and scope of TDP, but raise questions about the appropriateness of the programme design to its context. Other factors, such as issues around language of instruction and classroom materials, could be addressed by the programme and arguably will need to be addressed if the programme is to have an impact.

9.1.2 Implementation factors hindering impact

The evaluation framework (EDOREN, 2014) and the programme's updated theory of change (Annex A) also list several assumptions about how the intervention is implemented; these need to be fulfilled in order for TDP's training and support interventions to translate into improved teacher pedagogy and subject knowledge, and then into improved teacher effectiveness and better pupil learning outcomes. Several of these assumptions have been fulfilled: most teachers selected to take part in training attended training regularly, and the training programme appears to have been sufficient to instil new pedagogical knowledge in teachers. However, a number of the assumptions remain problematic:

- *Teachers can access and use audio-visual materials:* Teachers were often not able to access and use the audio-visual materials provided by TDP.
- *Teachers have the basic language, subject, and pedagogical skills to absorb the new knowledge and skills available from TDP:* Teachers' limited comprehension skills in English is likely to have prevented them from absorbing some of the new knowledge.
- *Selected teachers being supported to apply their new knowledge:* Head teachers are doing less of some key support activities, such as lesson observations and meeting with teachers. Head teacher absence from the school, and high head teacher turnover may prevent good practices from being embedded in schools. Head teachers and teachers had mixed views on the usefulness of school support visits.

The programme's updated theory of change notes two additional key assumptions relating to implementation:

- *Subject content knowledge can be acquired indirectly through the pedagogy training and self-learning facilitated by access to education technology:* Teacher subject knowledge has not improved at all. Pedagogy training, combined with use of education technologies, does not appear to be effective in this context as a means of improving teachers' subject knowledge. As TDP has already recognised in its interventions focused on reading, more intensive and focused interventions appear to be needed.
- *Support and mentoring will be provided at sufficient intensity and quality to consolidate learning of existing teachers and student teachers:* Support and mentoring appears to have been sufficient to ensure a change in how teachers teach, but not to have an effect on teacher subject knowledge or, ultimately, pupils' learning.

In addition, TDP training initially focused on Primary 1-3 and training focusing on content relevant to Primary 4-6 only started in []. This may have reduced the impact of the programme on pupils who progressed from Primary 3 through to Primary 6 during the period of this evaluation.

9.1.3 Unanticipated consequences of the programme

Pupil enrolment and multi-grade teaching have increased faster in treatment schools than in control schools. It is possible that the intervention, and visible change such as the availability of more materials, have attracted more pupils to the treatment schools. This should be seen as a positive effect, as it is likely to have increased the proportion of children attending school in the local community. However, it may also have affected TDP's ability to have an impact on learning outcomes, as it is more difficult for teachers to apply new pedagogical skills in overcrowded classrooms.

9.2 Recommendations for TDP

If TDP, and subsequent education programmes in Nigeria, are to have an impact on pupils' learning, they will need to overcome at least three key obstacles: very low levels of teacher subject knowledge; the use of a language of instruction that pupils (and often teachers themselves) do not understand; and weak school management. The following sections suggest some options for how to take on each of these. Ultimately, they will need to be discussed among TDP, DFID, and federal and state government stakeholders, in order to understand whether they are feasible and useful.

9.2.1 Raising teachers' subject knowledge

TDP has made concerted efforts to raise teachers' subject knowledge at the same time as improving their skills in pedagogy, with a training programme organised around subject areas. This evaluation suggests that these efforts have not been sufficient. Raising teachers' subject knowledge will be a slow process, depending heavily on teachers' prior education, their pre-service training, and the literacy and use of different languages in the states where TDP works.⁷⁶ It also depends on the ability of colleges of education to recruit teachers who meet a minimum standard in key subject areas, and the ability of the education system to ensure that enough teachers who meet such standards are recruited to primary schools afterwards.

There is now a strong body of evidence to suggest that teacher literacy in the languages of instruction and subject knowledge are the most important limitations on better learning outcomes in northern Nigeria. The authors are not aware of in-service training in other countries that has successfully improved teacher

⁷⁶ This evaluation has not looked at TDP's important work in pre-service training. Even if pre-service training can be radically improved, it will take several years before the better-trained new cohorts of teachers will make up a significant proportion of the total teaching workforce.

subject knowledge from such a low base. Nevertheless, it can be argued that improving subject knowledge should be the *main* focus of the support that is given to teachers, rather than being an add-on or integrated into pedagogical training. Although TDP's training is divided into different subject areas, the main focus of the training remains on pedagogical methods.

In response to learning about teachers' limited reading skills, TDP has implemented a Reading Programme for all teachers in Phase 1 schools. The Reading Programme consists of seven training sessions on groups of sounds in English and Hausa reading, using step-down training and Jolly Phonics materials. However, this intervention only reached around half of the teachers in treatment schools, and may have been too short to have had a substantial effect. TDP also introduced English Reading Clubs, in mid-2017, but few teachers reported having participated in these at the time of the endline survey.

The lack of progress to date in teacher subject knowledge in English suggest that much more ongoing and intensive support than this will be needed for teachers to reach a sufficient level of English reading and comprehension. Although English and Hausa reading appear to be a sensible priority, the programme may also need to consider how to improve teachers' subject knowledge in mathematics and science.

9.2.2 Improving the use of Hausa as a language of instruction in the early grades

Although teachers' subject knowledge was limited across English, mathematics, and science, they appeared to be most challenged in reading and writing in English. Despite this, teaching practices and textbooks remain strongly geared towards learning with English as the main written language, even though teachers spend some time explaining material in Hausa. Learning in a second (or sometimes third) language, with teachers whose own literacy in that language is limited, is unlikely to result in good learning outcomes. TDP is already providing materials in Hausa, but there is also evidence from other evaluations that teachers lack literacy skills in that language (Keck, 2017). Switching to more use of Hausa in early grades learning will therefore not be simple or quick but will require a longer-term commitment to widening the use of written Hausa and ensuring that teachers are able to read and write in the language.

9.2.3 Working on school management

The need for better school management is also well-recognised, and TDP has been offering school leadership and management training since 2015. The training was incomplete at the time of the endline survey, and so it is to be hoped that there will be future improvements in how schools are managed which in turn could lead to better learning outcomes. However, head teachers have little power or control when it comes to important aspects of school management, such as teacher recruitment and the ability to discipline or dismiss teachers. Similarly, although active SBMCs may be able to improve some aspects of school management, they will not be able to hold teachers to account and their ability to command additional resources from local, state, or federal government may depend on the wealth and influence of local community leaders. The findings from this evaluation suggest that ensuring teachers are present in the school and in the classroom, and identifying routes for head teachers to address teacher shortages in their schools, should be key areas for school management activities to focus on. This means working around head teachers' lack of power to discipline teachers, and working with SUBEBs and LGEAs to improve their responsiveness to schools' needs.

TDP does not currently work with SBMCs, and there may be scope for UBEC or SUBEBs to complement teacher training with support to SBMCs in order to improve the ways schools are managed. SBMC members are typically influential, interested members of the community, who live close to the school. They often have children in the school, so are personally invested in the school performing well. The SBMC performs several roles, including providing – moral support to the head teacher; monitoring the school; contributing time, money, and services; representing the school at the LGEA; and motivating other parents to send their children to school.

9.3 Additional areas for action

A number of contextual factors have been listed above that can prevent an intervention such as TDP from having an impact on learning outcomes. In this section, some factors are listed where the evaluation suggests that there is a need for action in the form of an intervention or policy change. These will need to be taken up by state governments and backed with sufficient political will to have an effect. TDP itself is due to end in 2019, but has an important role in advocating for interventions or reforms based on the lessons learned from its own intervention. These areas may also be important for DFID and other donors in planning future education sector programmes.

- *Recruitment and pre-service training of teachers:* This evaluation does not cover TDP's activities in pre-service training reform, but raises the need for change in how teachers are recruited, deployed, and trained in college. Household survey data indicates that, in Jigawa, Katsina and Zamfara, only a small proportion of the adult population is able to read well in English or Hausa. Recruiting sufficient teachers from this part of the population is likely to be challenging. It may be possible to improve teachers' literacy and subject knowledge during pre-service training or through in-service training of the type that TDP has recently started, but (as noted above) there is little precedent for raising subject knowledge from such a low base through training alone. Raising subject knowledge through pedagogy-focused training, in particular, does not appear to be effective. It may be necessary to focus more on the recruitment of teachers who have higher levels of ability in the first place, perhaps offering further pre-service reading and subject courses to compensate for the limitations of the basic education that candidate teachers have themselves received.
- *Use of educational technology:* As part of TDP, teachers were given mobile phones or SD cards, and schools were given amplifiers for use in lessons. Teachers reported finding the audio-visual materials given to them useful, but the technology was rarely observed being used during a lesson. Amplifiers often remain in the head teacher's office, and there were frequent technical problems in using them. Overall it is not clear how useful education technology has been in the TDP intervention. However, given the need for more intensive intervention on improving teachers' reading and subject knowledge, it may be useful to reconsider the ways that technology could help towards this goal.
- *Pupil attendance:* Pupil attendance varies seasonally and, according to teachers and head teachers, is often affected by the need for children to work. School-feeding programmes may be effective in drawing children to school, although the evidence in this evaluation suggested that they do not always stay after the food has been distributed. Interventions such as cash transfers have been effective at increasing attendance in other contexts (Snilstveit *et al.*, 2016), but schools may also need to maintain flexible timetables so that children who work can still attend.
- *Teacher attendance:* More research may be needed on the reasons why teachers are often not present in class. Some schools have a clear shortage of teachers, while in other cases teachers' circumstances frequently draw them away from the school; in others still, teachers are in the school but do not attend their assigned classes. Limited knowledge of subjects that they do not usually teach may reduce teachers' ability to cover for teachers who are absent. Better systems of accountability may be needed to ensure that teachers attend school regularly and teach the classes they are assigned to. Steenbergen and Hill (2017) recommend that SBMCs be given a formal role in teacher accountability, and that head teachers be given more formal powers over teacher recruitment and pay.
- *From subject teachers to class teachers:* A move towards class teachers, who teach multiple subjects to one grade, rather than subject teachers, who teach a single subject across grades, has been tried in Katsina and Zamfara, and is awaiting roll-out in Jigawa. This may help to address

shortages of teachers in key subject areas. However, in this evaluation, teachers who do not currently teach a particular subject had particularly low knowledge in that subject. In the short term, the switch to class teachers could therefore worsen the problems caused by low teacher subject knowledge, although it may help to alleviate teacher shortages and lack of subject specialists.

- *Curriculum and materials:* Pupils are clearly left being behind by the Nigerian primary curriculum. Most have very limited reading ability by Primary 3, and so do not have the foundational skills for acquiring further knowledge. Teachers need to be able to assess pupils' current level of ability, and target lessons to that level rather than following the textbook or curriculum, even though many pupils have not yet acquired earlier knowledge and skills. Interventions such as remedial classes (see Snilstveit *et al.*, 2016) may be effective for the learners who struggle the most, but in the schools in this evaluation, it is the majority of learners who are struggling. There is an argument for reforming the primary curriculum to ensure a greater emphasis on foundational skills and to reduce the total amount of content that teachers attempt to cover.⁷⁷
- *Language of instruction:* The evaluation shows how out of step Nigeria's language policy for primary education is with what happens in schools. The policy of using the local language for Primary 1–3 cannot reasonably be implemented without the widespread availability of textbooks and other materials in Hausa, and without ensuring that teachers themselves can read and write in the language. The policy of switching to English as a language of instruction in Primary 4 is also not realistic without dramatic improvements in teachers' English skills. As suggested above, the results of this evaluation suggest that improving the use of Hausa as a language of instruction should be a priority.
- *Ensuring teacher motivation:* A number of issues that undermine teacher motivation may need to be addressed in order to ensure that teacher training programmes can have an impact. The responses of teachers in this evaluation suggest that these issues include regular payment of teachers' salaries, paying a sufficient salary for teachers not to live in poverty, putting in place a fair system of promotions, and ensuring sufficient teachers for the number of pupils.
- *High teacher turnover:* The programme should acknowledge and plan for high teacher turnover, by setting out explicit guidance for what happens to teachers who transfer schools in the middle of training. For example, teachers who join the training programme mid-way may have difficulty following, while those who leave mid-way may fail to consolidate their new knowledge. This could be achieved by offering training in a way that tracks the current ability levels of the teachers in each group, rather than rigidly following a training schedule.
- *Teachers' ability to monitor progress:* Teachers need to be able to monitor pupils' progress in order to understand what level of competency the class has reached and to identify pupils who may be falling behind. The teachers in this evaluation had very limited ability to monitor pupils' progress, confirming findings from the baseline and formative research (De *et al.*, 2016a; Doyle, 2016). It may be useful for TDP to include specific training sessions on ways of simply and rapidly assessing pupils' progress, and to manage the curriculum while also tailoring lessons to pupils' current level of understanding.

9.4 Lessons for other in-service teacher training programmes

The results of this evaluation point to a need for careful evaluation of context before implementing primary education improvement programmes. In the case of north-western Nigeria, the combination of very low

⁷⁷ Tanzania undertook a curriculum reform along these lines in 2015, for similar reasons. See Rawle *et al.*, 2017.

levels of subject knowledge among teachers, difficult infrastructure conditions and lack of materials in schools, and a language of instruction policy that does not fit well with what teachers are able to do, create a particularly complex context for teacher training and support. There are many circumstances that can prevent a programme from working as intended, and which are beyond the programme's control, yet need to be addressed by it.

In such contexts, there is a need to be realistic about what can be achieved in terms of change in pupil learning outcomes in the space of three years. There may be a greater need for a multi-faceted approach which addresses multiple issues faced by the education system, including not just teachers but school management, governance, and accountability. There may also be a greater need for an iterative approach that can rapidly change course in response to new learning. In this case, for example, there may be a need for an increased focus on teacher subject knowledge and basic skills rather than pedagogy – which is important but insufficient to improve pupil learning outcomes – but also acknowledge that it would be difficult and risky for a programme such as TDP to change course in this way at this late stage.

The evidence that the use of technology in TDP had any positive impact is scant. New technology could be valuable if it is guided by a prior and thorough evaluation of teachers' most pressing needs – in this case, these revolve largely around subject knowledge – but can also potentially act as a distraction from more low-technology ways of addressing these needs.

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Annex A TDP Theory of Change (updated December 2017)

TDP Theory of Change Narrative

The Teacher Development Programme is a six-year, DFID-funded, technology-enhanced programme for improving the capacity of teachers in Nigeria. The programme aims to support governments at the federal and state levels to improve teacher education by strengthening three core areas: in-service teacher training and support; pre-service teacher education; and research and evidence. Beneficiaries are expected to be: basic education teachers; teacher educators; student teachers; and education policymakers.

The programme is designed in two phases: a pilot of a model developed for the Nigeria context based on the pedagogical literature and the recent experience of ESSPIN. Drawing on lessons learned from the pilot stage (in Jigawa, Katsina, and Zamfara), changes have been made in preparation for the scale-up to Kano and Kaduna states. This Theory of Change sets out the propositions and assumptions for TDP based on lessons learned from Phase 1.

The **key propositions** of TDP's strategy are:

1. An expanded cadre of local trainers and quality assurance officers will provide teachers with ongoing, in-situ, support;
2. Head teachers' leadership role and management functions significantly influence the potential effectiveness of classroom teachers;
3. Teachers will be trained primarily to be classroom teachers rather than subject teachers;
4. Teachers of all capabilities and length of service will benefit from an intensive one-year in-service training to improve their content knowledge and ability to teach this content;
5. The use of technology for self-learning is key to the learning of students and the professional development of teachers; and
6. Increasing teachers' English proficiency is a critical component of improved (classroom and subject) teaching.

TDP's **key assumptions** underlying each of these propositions remain that:

1. More intensive and broad-based training is an effective means of raising the competence of the current cohort of in-service teachers;
2. Head teachers have the autonomy and resources in the current system to exercise leadership and management skills;
3. Subject content knowledge can be acquired indirectly through the pedagogy training and self-learning facilitated by access to education technology;
4. Support and mentoring will be provided at sufficient intensity and quality to consolidate the learning of existing teachers and student teachers; and
5. CPDC training is an effective means of raising the competence of the current cohort of teacher educators.

[The five key assumptions relate to the five numbered triangles on the Theory of Change diagram below.]

