Department for Education

TLIF evaluation: Geographical Association/Association for Science Education Critical Thinking for Achievement project

Final Report

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Authors: Claire Wolstenholme, Sarah Reaney-Wood and Bronwen Maxwell Sheffield Institute of Education (SIOE)

Suzanne Straw, Dawson McLean, Jack Worth and Ruth Staunton, National Foundation for Educational Research (NFER)

Government Social Research

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Key findings summary

- The Geographical Association (GA) and the Association for Science Education (ASE) Critical Thinking for Achievement (CTfA) project aimed to improve the quality of geography and science teaching in schools by providing subject-specific continuing professional development (CPD) to teachers and subject leads. CTfA was delivered in either a two full-day model or two/ three half-day/twilight models.
- The target was for 70 per cent of recruited schools to be in priority areas (Achieving Excellence Areas category 5 and 6 areas) and, of these, 70 per cent to also be priority schools (Ofsted rated 3: Requires Improvement, or 4: Inadequate). GA over-recruited schools in priority areas (84 per cent). However, only 36 per cent of participants from priority areas were also from priority schools (below the 70 per cent target).
- Recruitment to the CTfA project was initially slow due to a late start, meaning schools had already planned their CPD activity for the year ahead. However, over the duration of project GA recruited in excess of their target (380 schools and 1039 participants).
- Thirty participants took part in a 30–45-minute semi-structured telephone interview (20 from primary and 12 from secondary schools) and case-study visits were undertaken in two schools; 82 per cent of evaluation participants were from schools in priority areas and 41 per cent of these participants were also from priority schools. Twenty-one of the teachers interviewed accessed the two full day model of training, and nine had received input through the three half day model.
- Mixing both subjects (geography and science) and primary and secondary teachers on the same courses did not work for all participants. Often, primary school teachers (when in a group of secondary subject specialists) felt the course was not tailored sufficiently to their needs.
- Participants consistently praised the ‘plan-do-review’ element of the project, valuing the experiential, practical focus of the project. A key enabler for implementation was the provision of a variety of activities that were simple and easy to implement. Teachers appeared to have made some sustained use of the CTfA activities and planned to continue using these in their schools.

- Networking opportunities were appreciated but were predominantly limited to discussion during the project sessions for the majority of interviewees. None of the interviewees had taken part in the follow-on enhanced 12-week course.

- Teachers reported a positive impact on their pedagogy, but little to no impact on their subject knowledge. Lessons with increased pupil-led learning were seen as a positive development for teachers and pupils, and teachers reported an increased engagement and enthusiasm for learning in their pupils. Teachers also reported being more confident and able to teach more complex ideas, and to ask pupils more critical questions. There was some limited evidence of increased satisfaction with teaching and teachers feeling more valued following participation.

- Analysis of the SWC data provides some evidence to suggest that the project may have had a positive impact on retention of primary school teachers. However, it is not possible to fully disentangle the effect of the project from other non-observed systematic differences between CTfA participants and non-participants. The project was not estimated to have had a statistically significant effect on retention rates for secondary school teachers.

- There was no evidence of any positive impact on teacher progression in primary or secondary schools, with some findings suggesting CTfA primary teachers were less likely to progress than comparison teachers. However, it is not possible to fully disentangle the effect of the project from other non-observed systematic differences between CTfA participants and non-participants. Very limited impacts were reported in the qualitative data related to pupils' attainment in, or increased take up of, GCSE and A-level Science and Geography. Due to impacts from Covid-19, the planned pupil attainment analysis was not undertaken.

Glossary of Terms

Achieving Excellence Areas - AEA Categories are DfE classifications of educational performance and capacity to improve by Local Authority District (LAD). The split areas into six categories from "strong" category 1 areas to "weak" category 6 areas.

English Baccalaureate (EBacc) - is an accountability measure in England. It measures the proportion of children who secure a grade 5 or above in English, Maths, Science, a humanity, and language GCSE.

Expert trainers - Employed by the Geographical Association and deliver the Critical Thinking for Achievement (CTfA) project to teachers in their locality.

Host schools - Schools who volunteered to host the training in their school, this often involved the whole school teaching staff being present for the training. Sometimes host schools would also recruit teachers from other schools to attend.

Opportunity Areas - part of the government's national plan for dealing with social mobility through education. 12 local authority district areas have been identified owing to the social, economic, and culturally challenges faced, and provided additional government support, the primary focus being on improving educational support in these areas.

Priority areas - Category 5 or 6 Achieving Excellence Areas (AEAs) Local Authority districts, including the 12 Government Opportunity Areas - areas identified as having weakest performance and least capacity to improve.

Priority schools - Schools with an Ofsted judgement of 3 or 4 (Inadequate or Requires Improvement (RI).

School based deliverers - Teachers could become 'school-based deliverers' and deliver the training to their teacher colleagues by attending 'train the trainer' validation training.

Teaching and Leadership Innovation Fund (TLIF) - DfE programme (2017-2020) aimed at improving pupil outcomes and support pupil social mobility by improving teaching and leadership in priority areas and schools through outcome-focused, evidence-based, and innovative professional development provision.

1 About GA/ASE and the evaluation

1.1 The Geographical Association Critical Thinking for Achievement Project and the evaluation

Background

The Geographical Association (GA) and the Association for Science Education (ASE) Critical Thinking for Achievement (CTfA) project ran between September 2018- March 2020 and set out to improve the quality of geography and science teaching in schools, by providing subject-specific continuing professional development (CPD) to teachers and subject leads in primary and secondary schools. The GA led the project, with ASE as a partner involved in some of the recruitment, delivery and shaping the resource materials. The GA was responsible for the project as a whole, including ensuring project delivery, and reporting monitoring data and progress to the DfE.

Aims

The primary aim of the CTfA CPD project was to equip primary and secondary teachers with the means to teach critical thinking in geography and science, in order to enable pupils to reason, justify and make informed judgements about the validity of data. Partly in response to the new GCSE and A-level specifications, the programme was intended to help secondary pupils make reasoned judgements in their exam papers, and equip pupils to critically assess the information they were presented with in the modern world. The project, therefore, was designed to ensure teachers were confident in their ability and had access to resources and activities to be able to teach critical thinking skills to their classes.

Delivery models

Two models of delivery were deployed; either an expert trainer would deliver the project, or schools could ask for a member of their staff to go on 'train the trainer' validation training, and they would then be qualified to deliver the CTfA CPD in-house. Having an expert trainer deliver the project was said to be the schools' preferred model by the GA project manager (PM), and most school staff interviewed had chosen this option.

Delivery format

The project for teachers was delivered over the duration of a term to new and existing school-based networks, comprising geography and science teachers from primary and secondary schools. The project was intended to be delivered flexibly, dependent upon the needs of the cohort, either via two full days or two to three shorter twilight sessions.

An additional 12-week extension was also available to be paid for by the school (see below). The project could be accessed in one of two ways:

- by individual teachers and/or subject leaders from different schools joining a group
- via a school-based approach where a school hosted the training, and multiple teachers and/or subject leaders from the same school attended.

The project comprised three sequential stages:

- Plan: initial planning sessions, which focussed on the specialist classroom pedagogies needed to meet requirements for knowledge application: critical use of data and evidence; construction of arguments; and geographical and scientific investigation contained in reformed science and geography qualifications and national curricula.
- Do: a supported classroom project phase, which aimed to create an opportunity to apply an aspect of specialist pedagogy to the circumstances of teachers' own classrooms, allowing time for planning and refining teaching over a school term and for assessing the impact on pupil achievement, using the CTfA project's guidance on expectations and progression.
- Review: a concluding CPD session, which invited sharing and critical reflection through peer and expert challenge. Teachers set goals for their further development during this session using the end-course questionnaire.

The project was intended to span between 8-12 weeks and included the key 'Plan, Do, Review' component as detailed above. For the two-day model, the 'Plan' phase was covered on day one of the course. Teachers then carried out the 'Do' phase in their own schools. Day two (the final day) was the 'Review' phase of the course. For the three-day model, the 'Plan' and 'Review' phases were staged over the three half days. The first supported the planning, the final supported the review, and the middle session supported aspects of both phases. The 'Do' phase was undertaken after the second session, meaning that some of the review information was given in the middle session before the gap task was completed.

Throughout the project, participants had access to an online community portal. This included an online forum for participants, which provided opportunities for teachers to: ask questions of each other, and the GA expert trainers; share examples of projects; engage in discussion prompts posted by the online consultant; and source resources and articles for discussion.

1.2 Theory of change

Co-construction of a theory of change (ToC) by the evaluators and GA was undertaken at an early stage of the evaluation. The project ToC (Appendix A) outlined key project activities, intended outputs, outcomes (intermediate) and impacts (longer term).

The rationale for GA's ToC was based on previous research that suggested English Baccalaureate (EBacc) attainment is beneficial to the prospects of disadvantaged pupils (Long and Bolton, 2017), as pupils with low levels of EBacc attainment are less likely to progress onto high-quality Level 3 qualifications. Furthermore, teacher quality is one of the most effective ways of improving the attainment of disadvantaged pupils (Morse, 2017; EEF, 2018) and evidence shows that subject-specific CPD raises the quality of teaching with most effect (Cordingley *et al.*, 2015; Allen & Simms, 2017; Cordingley *et al*., 2018). The vision of the GA CTfA project was that it would lead to sustained and improved subject-specific CPD provision in geography and science in targeted areas and schools. This would create specialist communities of practice, which enhanced the confidence and capability of teachers and, in turn, would lead to pupils demonstrating criticality that was driven by rigour, rational thinking and reasoning. There were two types of input, one based on the infrastructure created by GA/ASE (a training project for national subject expert CPD leaders and local CPD leaders,a training project for eligible schools/teachers and online spaces for participant discussion and resource access) and another based on training and support provided to teachers via a plan-do-review programme.

Two inter-related change processes were expected to lead, from the inputs described in the delivery format above, to positive outcomes and impacts. The first process concerned teachers' engagement with CPD and was expected to lead to shorter-term outcomes, such as increased capability, knowledge, engagement, and confidence and, over time, to the longer-term impacts of teacher retention and progression. Positive teacher outcomes were expected to lead indirectly to medium-term school outcomes such as enhanced quality of teaching, school capacity to deliver a knowledge-rich curriculum and appropriate curriculum challenge, and enhanced network activity. The second change process related to the implementation of the curriculum and pedagogical approaches advocated by the CTfA project in the classroom. This process linked positive teacher outcomes from participation in the CTfA project to shorter-term, pupil outcomes such as increased pupil engagement with complex issues, increased pupil confidence, and pupils' critical use of data and construction of evidenced arguments, to enhance engagement with social and natural science investigation. In the longer term the project expected to impact on pupil progress and attainment. Positive school-level outcomes, as set out in the ToC, provided a further support to enhance pupil outcomes and impacts.

Several factors were expected to mediate the implementation of the project and/or the resulting outcomes. These were: teacher-related (e.g. attitudes towards the project/CPD);

school factors (e.g. senior leader support, school culture); network factors (e.g. participants' cohesiveness and stage of development); local area factors (e.g. other competing CPD projects); policy factors (i.e. curriculum, assessment measures), and factors relating to GA/ASE (e.g. recruitment effectiveness and capability and experience of the national delivery team). If contextual factors, such as these identified in the ToC, acted as barriers to implementation of the learning from the CTfA project in schools, implementation fidelity (that is, the extent to which a project was implemented as intended) was expected to be undermined. This, in turn, was likely to weaken or impede the achievement of positive outcomes and impacts. As a result, if implementation fidelity was low in the delivery of the CTfA CPD project, outcomes and impacts were also likely to be limited. The theory of change is evaluated in section 6.

1.3 Contextual factors

The CTfA project was one of ten DfE-funded TLIF projects. The DfE wished to test out how effectively a variety of different CPD approaches could meet project-specific and fund-level outcomes; therefore each of the ten projects were commissioned to be intentionally different in design, scale, scope, and delivery method. At fund level, the evaluation sought to compare and contrast the relative effectiveness of these projects in meeting their stated aims and objectives – taking into account a range of factors related to their differences. These include:

- **impact focus and target group -** the project targeted individual teachers, groups of teachers or the whole school (in the case of host schools).
- **phase supported -** the CTfA project supported both primary and secondary schools.
- **per-participant cost -** (calculated by comparing the overall cost specified in the project's bid against the number of participants that the project was contracted to recruit[1]). Relative to the other TLIF projects, the CTfA project was low cost.
- **intensity of the delivery model -** (categorised by creating a combined score incorporating: duration of provision offered (in months), hours of provision offered (per participant); and proportion of school staff that the project aimed to engage[2]). Relative to the other TLIF projects, the CTfA project had a light touch delivery model.

[1] High-cost projects had a relatively high per participant budget, medium-cost projects had a relatively medium per participant budget and low-cost projects had a relatively low per participant budget.
[2] We do not have dosage data – so this assessment is based on intention rather than actual involvement, but it provides an indication of the nature of delivery. Our three resulting categories were: 'intensive'; 'moderate' and 'light touch'.

- **range of delivery modes -** (categorised into two groups: a wide range (five to six modes), and a moderate range (three modes[3]). The CTfA project had a moderate range of delivery modes relative to other TLIF projects.

1.4 Evaluation methodology

The aim of the evaluation was to undertake a process and impact evaluation to explore indicators of effectiveness and to measure impacts (teacher retention and progression) alongside outcomes; such as improvement in teaching quality and increased confidence(see Chapter 4, Table 1 for full details).The objective was to draw out learning and best practice, test out the project's theory of change, and identify implications for the fund-level assessment, as well as educational policy and practice more broadly. Our original evaluation design also included an impact evaluation to assess the impacts of the project on pupil attainment. However, due to partial school closures as a result of the Covid-19 pandemic, and the cancellation of Key Stage 2 assessments and GCSE examinations for the 2020 cohort, DfE decided to remove this aspect of the evaluation. Therefore there is no pupil impact analysis aspect to the evaluation. The evaluation does not contain a survey element.

This final evaluation report draws on secondary data from the School Workforce Census (SWC[4]), and qualitative data. It provides a measure of the project's success in achieving the TLIF programme's impacts (SWC data), and both the TLIF programme and project-specific outcomes (qualitative data). SWC findings are supported by rich qualitative data which aids understanding of the recruitment, delivery and implementation factors that influenced achievement of the TLIF programme and project-specific impacts and outcomes. The report explores the links between inputs, outcomes and impacts, analysing the appropriateness of the project's ToC in achieving desired results. The evaluation data sources underpinning this report are outlined below:

- a comparison of secondary data from the SWC for CTfA participants, and for a matched group of non-CTfA participants[5]. CTfA participants were identified via project MI data, which was collected by DfE and shared with the evaluators.
- in-depth interviews with the GA project manager at three time points (January 2019, December 2019, March 2020). Two were conducted by phone and one was face-to-face.

[3] No projects had four modes of delivery and no projects had fewer than three.
[4] This work was produced using statistical data from ONS. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates.
[5] Non-CTfA participants were defined as any teacher who was not enrolled on the CTfA project, or any other TLIF intervention

- in-depth telephone interviews between October 2019 and March 2020 with 30 teachers who had received the CTfA CPD[6].
- case-study visits completed in March 2020 with two schools who had hosted the CTfA CPD in their school, including within each school: an interview with the head or deputy head; an observation of a lesson where CTfA techniques were used; a focus group with teachers, and a focus group with pupils from the observed class.
- in-depth telephone Interviews with three school-based training deliverers.

Telephone interviews typically lasted between 35 and 45 minutes.

The first two interviews with school-based deliverers were undertaken in March 2019 to provide early interim findings. Due to initial delays in recruitment, these trainers therefore had only delivered training to around three groups of teachers. This meant that their responses around feedback and outcomes were necessarily more limited.

Description of SWC matching and analysis methods

Appendix B describes the methods used for matching MI data to SWC data, and for constructing a comparison group. Appendix C describes the results of the impact analysis. In summary, the steps were as follows:

1. The MI data was matched to the SWC using Teacher Reference Numbers (TRNs), names and dates of birth. This matched 94 per cent of CTfA participants as recorded in the MI data with at least one record in the SWC.

2. CTfA participants were matched with non-participants using propensity score matching. Matching for the full sample used teacher and school characteristics (age, gender, years of experience, Ofsted rating, etc. – see Appendix B for the full list) observed in the baseline year, where baseline year for CTfA participants was defined as the year the teacher was recruited to the project.

3. The retention rates in state-sector teaching among those in the treatment and matched comparison groups were compared using a logistic regression model, one, two and three years after baseline and controlling for the variables used for matching. The same process was followed to estimate the impact on retention within the same school/local authority (LA)/ challenging schools [7]

[6] two teachers had completed only one day of the two days of training.
[7] Challenging' schools were defined as schools rated by Ofsted as 'requires improvement' or 'inadequate'. A teacher was defined as remaining in a challenging school if they either stayed within the school they were in at baseline, or moved to another school which was rated 'requires improvement' or 'inadequate'.

4. Differences between the groups in progression rates (to middle/senior leadership) within the profession and within the same school/LA/challenging schools were estimated using a similar model as in step 3.

5. Similar analysis was then performed at the school level. Project participating schools were matched with non-participating schools using propensity score matching. Matching for the full sample occurred on the basis of school characteristics (school phase, Ofsted rating, etc. – see Appendix B for the full list) observed in the baseline year, where baseline year was defined as the academic year that recruitment to the programme started.

6. The retention rates in state-sector teaching among teaching staff in the treatment and matched comparison schools were compared using a logistic regression model, one, two and three years after baseline and controlling for the variables used for matching. The same process was followed to estimate the impact on retention in the same school, retention in the same LA, retention in a challenging school, progression within the profession, progression in the same school, progression in the same LA and progression in a challenging school.

Sampling process for qualitative data collection

In order to recruit teachers to take part in a telephone interview or case-study visit, a sampling strategy was used to maximise variation in participants' characteristics. Participants were predominantly a mix of science and geography teachers/specialists. Full details of the achieved sample by subject and phase are tabulated in Appendix D.

The sampling process was conducted over time to take account of rolling recruitment/different cohorts. GA sent through new participant details, and these were matched against existing ones to delete duplicates. As no details on schools' Ofsted or AEA rating was available from GA, these had to be searched for and manually entered against each school. Data was also not provided on participants' roles within the schools (head, Subject leader, teacher) and, therefore, this was unknown until school contact was made.

Schools were organised by their priority status (Ofsted 3/4 and/or AEA 5/6 or not) and then a random sampling technique was used to identify a sample of schools to contact. However, due to very low uptake from the CTfA participants contacted to participate in the research, opportunity sampling was eventually employed, meaning all remaining participants (regardless of the school's priority status) were contacted. This approach resulted in a sample of interviews and case studies that broadly reflected the characteristics of schools/participants participating in the programme.

Achieved sample for qualitative data collection

Twenty primary and 12 secondary school participants from 26 schools took part in the qualitative evaluation.

Tables 28 and 29 (Appendix D) show that (when including both case-study schools and schools with whom teacher telephone interviews were conducted) 81 per cent (n=26) of schools were from AEA 5/6 category schools. Out of these 26 schools, 50 per cent (n=13) were also schools with Ofsted ratings of 3 or 4. When looking at case studies alone, 100 per cent of the schools were both AEA 5/6 and Ofsted 3/4.

The qualitative sample did not reflect balance against the recruitment target set by DfE, i.e. 70 per cent of schools within priority areas and, within those priority areas, 70 per cent of schools with Ofsted ratings 3 and 4. However, looking at the management information (MI) data submitted by GA to DfE in February 2020 (Appendix F), the qualitative sample did reflect GA's achieved recruitment. GA met their recruitment target with 84 per cent of schools recruited being located in priority areas. However, only 36 per cent of participating schools from priority areas were also priority schools (less than the 70 per cent target).

The resulting sample has implications for the interpretation of findings as they are most reflective of the experiences of non-priority schools in priority areas. As such, caution needs to be exercised in making claims about this project for all schools in priority areas.

Challenges in recruiting evaluation participants

Once participants agreed to take part in the evaluation, data collection was relatively straightforward. However, recruiting participants to the evaluation was a difficult and time-consuming process. After sampling, schools were approached through a hard copy letter introducing the evaluation and requesting their participation. Follow ups were then made via emails and phone calls to schools. Challenges with evaluation recruitment were experienced, with many potential participants not responding at any point of contact. Schools/participants were contacted on average four times before it was considered unethical to make further contacts. Owing to the 'light-touch' nature of the project, there may have been a limited commitment from participants to engage in the evaluation.

Qualitative data analysis

Interview transcripts were uploaded into the qualitative data analysis software package NVivo and coded using an analysis framework based on the logic model headings (see Appendix A). Analysis was conducted looking at both fund-level and individual-level project outcomes.

1.5 Focus of this report

- This final report focuses specifically on: **Section 2 – Recruitment and retention** (whether the project met its targets for school and participant recruitment, and the factors that supported and hindered this).
- **Section 3 – Delivery and implementation** (whether this progressed according to plan; what worked well and not so well; and what lessons can be learned for future CPD offers).
- **Section 4 – Perceived outcomes and impacts of the provision** (the extent to which the projects met, or had the potential to meet, the TLIF programme's outcomes and impacts, and their own bespoke project outcomes).
- **Section 5 – Sustainability** (discussion of the potential for sustainability of new ways of working, new learning and outcomes in schools, which have come about through involvement with the project).
- **Section 6 – Evaluation of the GA/ASE Critical Thinking for Achievement (CTfA) project theory of change**
- **Section 7 – Summary and indicative implications for policy and CPD development**

2 Recruitment

2.1 Recruitment to targets

The 2020 MI data can be viewed in Appendix . GA recruited 384 schools to participate: 60 per cent were primary, 39 per cent secondary and one per cent special schools. A total of 1050 (1039 after attrition) teachers took part in the CTfA project. Eighty-four per cent of schools were in priority areas (AEA category 5 or 6), but only 36 per cent were also priority schools (Ofsted rated 3: Requires Improvement, or 4: Inadequate). Analysis of the following additional MI data can be found in Appendix F:

- distribution of participating schools across Regional School Commissioner (RSC) region
- school type
- school phase
- attainment at Key Stage 2
- proportion of schools in AEA areas and proportion of schools by the Index of multiple deprivation
- Participant characteristics including role, school phase and main subject

2.2 Recruitment methods

Recruitment began in late September 2018 and was said by the GA PM to have had a slightly delayed start, with recruitment intended to begin early September. Recruitment was initially slow as the delay meant schools had already planned their autumn term CPD. Recruitment methods were reported by the GA to be both targeted and more generic. For example, 1000 Ofsted 3 and 4 schools were sent direct emails about the project, GA produced flyers for publication, posted information on the GA and ASE websites, and shared information through social media. Two members of staff were employed as recruitment officers tasked with identifying school networks and then supporting these networks with the recruitment of schools, including identifying those schools classed as priority schools.

Post-Christmas (2019), recruitment became much easier and, by March 2019 (the time of the final PM interview), GA reported that their efforts in recruitment, along with word of mouth and being able to use teacher feedback in promotion materials, had been successful, creating a 'snowball effect'. The GA PM explained at the midpoint interview (December 2019) that they were at the point of halting their recruitment efforts to ensure they did not over-recruit.

2.3 Challenges and enablers to effective recruitment

2.3.1 Recruitment challenges and enablers

As outlined above, the first interview with the project managers at GA revealed that **recruitment was initially difficult due to a delayed start to recruitment.** Although interest from schools was relatively high, the timing of the initial training in the autumn term meant that schools had already filled their CPD calendars by the time they became aware of the CTfA CPD. This was compounded in the early stages by a lack of word-of-mouth participant recommendations related to the low level of initial delivery. The late start to project delivery then meant that the bulk of the delivery was clustered in the second half of the project delivery period.

Host schools were also sometimes unable to recruit the requisite numbers of schools/teachers to take part and, therefore. a small number of early sessions did not go ahead.

GA reported persistent difficulties in recruiting schools that were both in AEA categories 5 or 6 and Ofsted grade 3 or 4:

> The ones that are coming forward, they're either/or, but very rarely both. As a consequence, that's been a real challenge. And our percentages have stayed relatively consistent. It's around 40 per cent that are both. - *PM mid-point interview*

This was particularly hard at the early stages of recruitment, as GA needed to balance achieving overall project recruitment target numbers with ensuring target schools meeting the area and school criteria were reached:

> So, in February/March we were very much… actually we need to get people doing the project and engaging in the training. If they were one or the other we were saying actually we'll say yes. And as we've kind of gone on and felt more confident about hitting those targets… the messaging has been very clear. It's been, you can do it and your school can host it, but you need to try to get as many people that meet both criteria as possible. - *PM mid-point interview*

As the quote explains, GA were able to be stricter with accepting only priority schools once their confidence had increased that target numbers overall would be met. At this stage, those networks where it was proving a challenge to recruit teachers from schools meeting the criteria were told to postpone until they could locate appropriate schools to be involved.

The reason recruiting eligible schools was difficult was said to be due to these schools often being harder to reach, due for example to competing priorities:

> They’re often schools that are under intensive pressure from a whole variety of sources. - *Expert Trainer two*

GA PMs also reported how they might have overestimated the likely engagement of schools in Opportunity Areas (OAs), finding in reality that this was lower than expected, meaning that they had to rely more heavily on professional networks and word of mouth, as 'cold' approaches were less effective.

In addition, one school-based trainer spoke about one of the locations that he was assigned to work in by the GA which had a majority of schools in the 'good' or 'outstanding' Ofsted categories, meaning locating priority schools was more difficult, and teachers in schools further away were reluctant to travel long distances for CPD. There were also discussions between this trainer and GA about the value of limiting the training to priority schools, when schools in the ‘good’ category, for example, could also be helped to move towards ‘outstanding’. This trainer emphasised the fact that, had they not accepted some schools outside of priority criteria, there would not have been enough schools in that location to run sessions.

Recruitment improved over time and, during the final PM interview (March 2020), recruitment was said to have been 'fantastic', with a snowballing effect created in part from word of mouth (teachers who had attended) and from GA marketing and teachers having attended training, given as the reason.

Collecting the participant data from recruited schools proved to be a difficult task for GA:

> Getting people to come – not a challenge. Getting people’s names, TRNs in particular and data – teachers don’t see it as important, but obviously it’s crucial for funding purposes. It’s something that just takes a lot of time to chivvy and chase and chivvy and chase some more. And there are some people who’ve been through the training and I don’t think we’re ever going to get it. - *PM mid-point interview*

The PM explained that, where delivery was to a whole school, data collection was much more straightforward, with one point of contact at the school providing data for all teachers, but they outlined the difficulties in obtaining key data when a network was involved:

> We’ve got a coordinator of the network. People come to the network and come to the training. That person may never have met those

> people before. They may not necessarily know which school they come from, but they might not have an email address. And then going back to the school coordinator and saying can you chase this data [is challenging]. - *PM mid-point interview*

The administration that went alongside hosting was mentioned as another challenge by one teacher interviewee who hosted the training at their own school. The teacher described feeling unsupported and under pressure to recruit teachers to attend:

> And I also felt that it was driven by making sure that – and I don't mean this to be unkind, because I know this is how things work really – but it felt like it was being very much driven by targets. If you don't get X amount of people on this, then we can't run it. We get that. We completely get that. But you need to give us a hand with that then. - *Secondary teaching school lead*

However, other teacher interviewees from host schools did not report this as a difficulty.

Professional motivation was a key enabler for teachers to attend the training. Teachers often had a combination of personal and school-based motivations for attending the CTfA CPD. Often, teachers' own personal motivations aligned strongly with school priorities, which were around strengthening teaching and learning in science and geography. A small number of teachers found the project appealing as it linked with areas they were already interested in, or had been trying to implement in the school, for example around meta-cognition and growth mind-sets. Other teachers simply answered that the course sounded interesting and **having no cost attached made it particularly accessible**. The majority of participants had chosen to participate in the training themselves, and although a smaller number had been asked to attend by a senior leader, there appeared to be a strong interest and motivation to take part.

2.3.2 Retention challenges

Retention was good overall but was also mentioned as a slight concern. Retention rates (i.e. participants attending all the CPD sessions), although generally good, had been poor in a small number of cases. The GA PM gave the example of a course where 11 teachers had attended day one, but only 6 were able to attend the second day, with the other five teachers being unable to get cover for their class. This was reiterated by one of the trainers in an early interview who felt that, due to the pressures often facing target schools, some found it more difficult to release teachers for the second day of training.

3 Delivery, and implementation of learning

3.1 Progress in delivery

This section briefly describes the delivery of training for the deliverers, before outlining: the delivery of the project to teachers; participants' perceptions of the quality of delivery; the implementation of the learning by teachers in school; and the associated challenges and enablers.

Delivery of training to deliverers and expert trainers

The training for deliverers and trainers was reported to be a good preparation to deliver the CTfA CPD to teachers. Both the expert trainers who delivered the CTfA CPD for the GA, and the school-based deliverers received training on how to run the project. On the whole, expert trainers and school-based deliverers felt that the training they received prepared them well to deliver the training themselves. The consensus was that the materials should generally be followed, but trainers could adapt them somewhat to their audience, for example tailoring to school phase or subject specialism.

One of the expert trainers explained how he had found the training to be good preparation for delivering the practical elements of the course. This trainer however felt that the theoretical side was perhaps not explored in sufficient depth to provide him with full confidence in this aspect whilst he was delivering to teachers:

> I found that, when it came to course delivery, those elements where there are key points to be made in relation to the theoretical underpinnings of the course were areas where I was a little less confident than I would have liked to have been. And I think that's probably because we didn't spend quite enough time on the theoretical elements in the preparatory work. - *Expert trainer two*

A school-based deliverer praised the 'train the trainer' training that they had received, expressing how it had permeated into how they had delivered the project to schools and, in turn, into teachers' actions:

> They'd been sent away for four or five months to give it a go. And the fact that 22 out of the 24 came back absolutely bursting with ideas I think probably is a testament, [going] way, way back, to the initial training in Sheffield, and then obviously the way we amended and delivered the programme. - *School-based deliverer*

Content of CPD: Types of activity

The project delivered was designed specifically to have experiential learning aspects. Activities were put into geography or science-specific contexts, and teachers were instructed to undertake these activities 'as students', in order to understand the activities from a pupil's perspective:

> It's been developed to have a mixture of theory and practical tasks and getting [participants] up and about, and getting them discussing things and collaborating and thinking about their own practice. I think it's rigid with flexibility, if that makes sense? - *Expert trainer one*

> The first one was focused on just looking at critical thinking approaches and trying to encourage that in the pupils. And then the second one was a review of what we had done following the training, for us to go away and come up with some ideas of how to implement them, and to come back and feedback. - *Secondary humanities lead*

The GA PM and the deliverers were keen to stress that participants were an active part of the project delivery sessions. Participants were expected to discuss, adapt, and trial the learning during and between sessions, and then feed back and reflect on early testing and implementation in the final session:

> I'd really want to strengthen the sense that it's an action learning rather than an action research course, because I think that's really important in terms of how people understand what they're receiving in day one, how they're going to use it and how the whole thing is structured. And I think that invites people to go on a sort of collaborative in-depth exploration together rather than to be told how to do something. - *Expert deliverer two*

This was reflected in teacher participants' recollections of the project:

> I think it was because we actually got to try out a lot of the activities ourselves. When you get to experience it yourself, it just makes it so much more interesting and you actually understand how it might feel to be a child and actually [how you can add that] into your lessons. - *Primary humanities lead*

> Getting us to be involved in the tasks and essentially being the students somewhat and practising it, that was good - to see what it's

> like to get us thinking like the students would be. That was quite beneficial. - *Secondary geography lead*

Consistency of delivery

The CTfA CPD delivery was described by the GA PM as being adaptable, ensuring that as many schools as possible could take part, by offering different session types. The CTfA training was offered as either two full day sessions, or two or three shorter twilight sessions.). The mode of delivery, as stated above, was 'plan, do, review', meaning that the first session(s) offered a mix of theory and activities, a gap task was set in-between sessions, and the last session focussed on reviewing, sharing and reflecting on the gap task. Time in between these sessions (to undertake the 'do' phase) was also made flexible to fit with school requirements. Although the ideal period was roughly nine weeks, this could be extended or shortened as necessary:

> It's more like, 'you want to do it? - We'll find a way to do it'. - *First PM interview*

In relation to content delivery, the PM stressed that this was consistently a high standard, although again it could be tailored somewhat by the deliverers (which is discussed further below):

> I think in terms of the structure, we've been very flexible, but one thing that we haven't compromised on is quality. And so, the national experts that we've used – they've all gone through a process to become consultants to the GA in the first place, but also they are very, very well-known to us. - *Final GA PM Interview*

The majority of interviewees had attended (or hosted) the two full-day training option, with varying amounts of time in between, from as little as two to three weeks to 12 weeks. The project took place at different locations, but predominantly appeared to be based at a school. Sessions were run with around 12 teachers each, however, this number varied depending on location and the form of delivery. Sessions were made up of teachers from schools in the local areas, but could be made up of a whole school (who hosted the training) or networks of schools, depending on recruitment methods:

> I organised it for our school. So, we hosted it here. We had I think about 18 people I got signed up…Not just from my school, but also through our alliance. - *Secondary assistant head*

> It was within our school for all the teaching members… everyone bar the nursery teacher. Everyone else who was a qualified teacher did

> it. And then also teachers from another school nearby came to join us as well, so it was a shared day with staff from the other primary school as well as ourselves. - *Primary teacher*

Groups of teachers attending training were also made up of primary and/or secondary teachers and geography and/or science specialists, or indeed more generalists for primary school attendees. Some of the sessions were made up of more homogenous groups, e.g. all secondary school geography teachers, whereas others were a mix with, for example, early years teachers through to secondary science specialists:

> There was a mixture of science teachers and geography teachers from all over really... There was a primary school teacher. There was only the one primary teacher that I know of that was on the course, but yes, she seemed to enjoy it as well. - *Secondary science teacher*

> It was from a range really from Nursery up to Key Stage 2. I don't think there were any high school teachers there. There was about ten or 12 of us. - *Primary teacher*

Where possible, the GA tried to match the expert trainer to the groups of teachers, for example, matching a primary specialist where the group was to be made up of predominantly primary teachers. This enabled a more tailored approach for some groups of teachers, however, this was not always the case, as described in 3.3 below.

Perceptions of effectiveness of delivery

The analysis uncovered that **participants on the whole were very satisfied with the project CPD they had received,** commenting on the knowledge and enthusiasm of the deliverers, the engaging nature of the training, and the beneficial sharing of ideas:

> I think it wasn't somebody who wasn't a teacher or didn't know or was just delivering a set of handouts or slides. It was somebody who's practising that themselves, if you know what I mean. So, I think the respect is there for being somebody with experience of delivering critical thinking, and being out in other schools, and seeing other ideas and sharing that good practice with us as well. - *Primary teacher*

Communication from GA between sessions was praised as being enough to ensure engagement, without teachers feeling overwhelmed:

> There was probably the right amount of contact between sessions as well – maybe two or three emails summarising what we had to do

> and just letting us know, but we weren't bombarded with emails. - *Secondary geography teacher*

> It was brilliant. If we'd had any questions, you could direct them. We were given an email address so, if we were wanting to get in touch with the course leader, we could email her and discuss any ideas or issues that we might have been having. So, yes, the support was brilliant. - *Secondary science teacher*

Teacher participants were asked directly if there was anything about the training that made it distinctive to other CPD they had been involved with. The most commonly occurring answers related to the practical elements of the training, where teachers could undertake activities themselves, which was said to be engaging and helpful to get into the mind-set of their pupils. The project was also praised for requiring action, meaning that it was kept in teachers' minds in between sessions and enabled teachers to test out and then discuss strategies in a 'safe environment':

> The thing about the project was, when you've been to previous CPDs, it's very much; we're telling you what to do. Whereas this wasn't. This was: this is an idea, this is how you could implement it, have a go now. - *Primary teacher*

This trialling (the 'do' phase) was said by one teacher to enable them to evidence impact early on.

In the early stages of delivery, one deliverer had a concern related to implementation by teachers. They felt that the delivery could become 'surface level' and viewed as a 'toolkit' of activities, as opposed to the deeper principles behind activities being embedded:

> The kind of things that people are mostly proposing doing are in effect running activities that are being modelled in the first day or the first two sessions, rather than necessarily taking principles from the course and applying those principles to their own practice in a deeper way. - *Expert trainer two*

To some extent, this could be seen to be the case, However, this was not perceived as a negative by teachers who commented that, unlike other CPD undertaken, they had found the CTfA training to be rich in the *'how'* to implement ideas, rather than solely dedicated to theory, and they valued the specific emphasis on pedagogy rather than the focus being on subject knowledge only, for example:

> Just how hands-on it was – and I know this will sound ridiculous, because it's a geography course – but the fact that it wasn't so geography-heavy, and it was giving us resources to implement our knowledge rather than just trying to throw knowledge at us. Courses are normally the other way around – you get given a lot of information, but not how to use it. But this was the opposite, and it was quite refreshing. - *Primary teacher*

Conversely, one participant felt that there could have been even more hands-on activity:

> It was a bit death-by-PowerPoint. There were points where we got up and we did little activities, but much of it was sat looking at a screen, which I think for me personally… I'm very kinaesthetic, I learn through doing and through taking part. So, for me I think it was quite – dry. - *Secondary teacher*

Participants were also asked if there was anything they found unhelpful or was missing from the delivery. Almost all interviewees said 'no' to this question, commenting that they had found everything to be helpful, with the exception of the comment above and some minor points, such as a lack of information pre-training about the nature of the project being a 'plan, do, review' format.

Use of the online portal and community was consistently described by participants as the aspect of the project they had engaged with the least, if at all. Participants reported across the board that they had not made use of the online portal and forum, with the exception of going online to download materials from Dropbox. There was a feeling from participants that, at the time they were involved in the course, there was not any need to look at the online resources illustrating that, for them, the resources provided during the training were plentiful and sufficient.

Where participants did state that they accessed the portal, little information was provided about what was accessed. Furthermore, some participants reported using the online materials, but then detailed their use of Dropbox, rather than the online forum:

> Yes, just the Dropbox which we had. I did use that, but I haven't used any sort of online forums or anything. - *Secondary, subject lead*

One participant reported feeling that the online portal seemed to be:

> A bit thin on the ground – I don't know if that was well-founded or not, but it didn't feel like it was a full-on community.

None of the interviewees had taken part in the extended CTfA training. Participants were asked if they were aware of the optional 12-week follow-on CTfA training. Over half of interviewees answered that they were not aware of this option. Some teachers were interested to know more and said they might consider the option pending further information and SLT approval. However, many cited school budget restrictions as a potential barrier to undertaking this further training, as this was to be paid for by the schools rather than funded by TLIF.

3.2 Implementation of learning

The GA project did not offer structured school-level support, but it did provide opportunities for planning for the implementation of learning and reflection on implementation as an aspect of its provision. It did this by providing the content and activity of the project in an online and hard copy resource pack; supporting participants via email, and through use of the gap task between training sessions.

Participants felt well supported by the GA in the early implementation phase, stating that they were able to ask any questions to GA, and these would be swiftly responded to:

> The support is there. And I know I've emailed [deliverer] a couple of times with questions and he's been straight back to me, offering advice, so that's good. - *Secondary geography teacher*

> The person delivering it was really good and she sent over extra information. And if we wanted anything, she just emailed it or posted it. She was really good. - *Primary teacher*

The CTfA CPD included a number of activities to use in class in order to enhance pupils' critical thinking. These were demonstrated during session one of the training through teacher participation in practical tasks. The most widely discussed of these, by teacher participants for both the gap task and further school implementation, are listed below, with a brief explanation of what the activity entailed.

Flat chat (sometimes known as silent debate) - A stimulus (usually an image of a specific location, e.g. London) is placed in the centre of a large piece of paper and placed on tables within a classroom. In groups on the table, pupils are asked to write on the paper what they think they know about the stimulus, as well as questions they may have about it. The activity is undertaken in silence, however pupils are encouraged to write their thoughts, facts, and questions as a conversation. After a set amount of time, pupils circulate to other tables to continue the conversation by, for example, commenting on or answering other pupils' questions and comments. Different coloured pens may be used

to show how these 'conversations' develop. The activity being silent, and being active, with numerous connections made on the different sheets of paper are said to 'stimulate deeper thought processes' (trainer one).

Question generator – This uses a grid document with question starter words written across the top of a page such as: w*ho, what, why, when, how*, and verbs written down the side, such as: *is, are, was, could.* Pupils use the grid to form questions about a particular topic or stimulus, by putting the starter words with the verbs in order to form questions. This can be used for Key Stage 1 pupils by choosing the starters such as 'what is…?' and for Key Stage 2 for more complex questions such as 'what could...?'

Pose, pause, pounce, bounce - A (usually open-ended) question is posed to a class of pupils, who are given a set amount of thinking time. The teacher then chooses a pupil to answer the question, whose response is then passed to another pupil to comment or build upon. This activity is designed for higher-order thinking and to initiate debate, with pupils challenging each other and using more complex question starters, such as 'why might…?' or 'how could…?'

On the whole, **teachers explained that the gap task activities trialled had been enjoyable and engaging for their pupils.** The gap task (or 'do' phase) was arguably the first stage of implementation, as it gave an opportunity for teachers to try one or more of the critical thinking activities with a class or classes. Although not supported directly by the GA to undertake the gap task, teachers were expected to present their trial of, and learning from, the gap task in the last CPD session. This gave an opportunity to reflect on the activity and discuss with the deliverer and other teachers the learning gained from this.

Participants described the activity or activities they had trialled, alongside their pupils' responses. Most had used 'flat chat', 'the question generator grid', or the 'Pose, pause, pounce, bounce' activities. Pupil reactions appeared to be mixed depending on the year group and whether the school had used similar techniques in the past. Teachers reported that some pupils found activities challenging, for example younger pupils who needed support in formulating questions or who struggled with the silence involved in 'flat chat'. Some teachers reported that their pupils were more engaged, enjoying a new type of activity; and, in the case of flat chat, teachers felt that pupils who might have been less vocal historically were able to be more engaged due to the nature of the task and the anonymity, meaning they would not be judged on their comments.

In one school, the gap task had uncovered feelings of discomfort for pupils who may previously have not been put on the spot to answer questions, and who were now being challenged to answer. This unease had also been somewhat extended to teachers who were expected to explain to pupils in detail why and how answers were incorrect:

> That was another turning point for teachers because that exposed weaknesses in their own subject knowledge, because what they were then required to do was to unpick what the child had said, unpick with the child and the rest of the class why that couldn't possibly be the answer, and then articulate very clearly what the answer was and how to get it. So, that was a big turning point, because what staff had to then do, whether they wanted to or not, was critically analyse their own subject knowledge and their own ability to deliver purposeful teaching. And, of course, in many cases, that's what – including myself – no-one ever wants to admit that actually they might not have the subject knowledge they need, or they might not be getting it right. That was obviously quite a tough learning curve. - *Primary school head teacher*

Sharing of learning within schools

After receiving the project, **many teachers found ways to share their learning within the school through various types of informal and more formalised dissemination.** The amount and type of input varied from sharing the resources with other teachers and informal talks with one or two members of the humanities team, to full staff meetings where teachers who had attended the project presented their learning to all teaching staff:

> Well I've now delivered a staff meeting to other staff members and I delivered some of the ideas that I was given in the project. It was really helpful actually and a lot of staff have said that they've used them now and [they think differently] about how to [plan] the lessons and things they can incorporate into the lessons. - *Primary history and geography lead*

> That's been informally rather than me standing there and doing it formally in front of everybody. People say 'ooh what have you done on your course?' – it's showing them and showing them work. 'Ooh, I like that idea'. So, I've had a chance to have those conversations. - *Middle school humanities subject lead*

> Yes. Immediately I was sharing it with my department, which is the humanities department. And, within that, I plan most of the geography lessons, so the other teacher that taught geography was getting the resources via me and I was explaining to him how to use them effectively. - *Secondary geography teacher*

Teachers who were in positions of responsibility (such as subject leads) also sometimes did learning walks or book checks in order to assess levels of implementation of critical thinking materials being used throughout different classes:

> I then took back to my school setting where staff have actually implemented it within their own classrooms. Because, obviously, I do book-looks and also learning walks, and it is actually feeding through, which is great to see. - *Primary science lead*

Other teachers, however, who were not expected to monitor implementation, took a less formalised approach, and saw the dissemination of learning as something helpful to other teachers if they chose to use the techniques:

> I think it's just – here's another string for you to add to your bow, use them. There's no checking that they're being used. It's just here's another thing. I've done some of these strategies for lesson observations before and stuff like that, so I put them in lesson plans. - *Secondary geography teacher*

For teachers who had taken part in an interview soon after the training, it was too early to comment on implementation by other teachers, as they explained they had not had a chance to share their learning.

Below is a vignette detailing the experience one school had of implementing the 'Pose, pause, pounce, bounce' method to develop the questioning skills of their pupils

Vignette One: Working on questioning skills with 'Pose, pause, pounce, bounce'

Teachers described implementing the CTfA ideas in order to improve both their own and their pupils' questioning strategies and skills. The 'Pose, pause, pounce, bounce' activity was said to assist this in a number of ways. Firstly, by allowing pupils increased time to think before giving an answer:

> I've moved up from Reception into Year 1, with some of these children that, if I'm honest, I never really got much of a response from, on some occasions. But, actually, what I've discovered… this is something that came from the first day, about how much time you need to give children to actually think and be able to formulate an answer or a response. And I thought I was quite good at giving children time to think and respond, but actually what I needed to do was maybe triple that time to think and respond…

> Because they’re using that time to really think about what’s been asked of them, which has been lovely, and I’ve really taken a lot from that. So, I think that’s been really quite a successful method. - *Primary teacher*

A teacher from a different school, who used the same technique, described how the activity was helpful in allowing pupils to deepen their understanding and their questioning skills:

> If you do it effectively, you get the student to ask higher-order questions and they can start to use the kind of ‘why might’ or ‘how could’ as opposed to the ‘what, when, why’. And that can help them to engage in a debate…

The same teacher also emphasised the benefits of asking pupils to challenge each other's ideas instead of being challenged by the teacher:

> Which I think is good for them, because it helps their questioning skills as well as just their response to questions. But also, when it’s the teacher who’s challenging them, sometimes they feel like ‘oh no, the teacher must be right’, whereas when it’s each other, they feel more confident to challenge their classmates as opposed to necessarily challenging me.

This teacher had conducted a mini trial, comparing classes where the questioning activities were used to one which was taught as usual, and tried to identify the outcomes after a year:

I had three classes that I looked at. In one, I integrated the questioning fully, completely, every lesson – the ‘Pose, pause, pounce, bounce’. In others, I integrated the worksheet. And then in the third class, I just kept my teaching practice as normal, so it was one to compare it to. And I found that the questioning class improved the most at the end of the year in terms of their results, but also in terms of the conversations that we were having. For the data side it’s a bit harder to quantify, but I felt that they were more confident discussing a topic and more intellectually confident as well. - *Secondary geography teacher*

3.3 Challenges and enablers in effective delivery and implementation of learning

This section describes the challenges and enablers to both the delivery and the implementation of learning from the CTfA CPD. Factors related to the provider/provision are discussed first before factors related to the school context.

3.3.1 Factors related to the provider/provision

The GA PM felt that **having very well-trained and enthusiastic deliverers was a key enabler to the delivery.** One trainer talked about the intention, in time, to tweak the materials and delivery to make it their own in order to have a level of authenticity, ownership and confidence in their delivery. This was enabled by the flexibility built into the delivery of the sessions, which was reported as another positive aspect of the project.

Mixing primary and secondary teachers and those from geography and science was seen as a hindering factor for some participants. Where teachers attending group training were from a wider mix of school phase and subject, tailoring the content of training was said to be more difficult, which led to some teachers feeling that the course did not meet their needs. For example, a trainer explained how some early career primary teachers had struggled to see how the content could apply to their teaching, given that there were also GCSE Science and Geography specialists in attendance:

> And I think that's an incredibly hard balance in a course. And I do wonder about actually what the value of combining that breadth of people teaching Key Stage 1 all the way up to Key Stage 4, across two different subject areas, is for people at the far ends of the spectrum, basically. I think there could be something about Key Stage 2 and 3 [together], which would be quite different. - *Expert trainer two*

This was also mentioned as an issue by a small number of teachers attending training. For example, one teaching school head teacher stated that the mix of subject and phase had diluted the training, commenting that it would have been better as a key stage and/or subject specific opportunity, adding:

> The quality of learning for these delegates was reduced as a direct result of combining secondary, primary, science and geography all in one go. - *Secondary teaching school lead*

Other primary teachers particularly, felt similarly, stating that the training they had experienced appeared to be aimed quite specifically at secondary geography specialists, leaving them with concerns about adaptations to their phase:

> I know another teacher on the course said that too – she was in Year 1 and she felt that a lot of them she couldn't actually do with the children, because they can't really read or write properly yet. - *Primary history and geography lead*

Some participants, therefore, suggested that training should be split up and tailored to school phase:

> That idea of differentiating it, having a different Key Stage 1, Key Stage 3 and 4, a Key Stage 1 and 2, might be beneficial for the future. - *Secondary teacher*

Others, however, felt that the cross-subject and cross-phase nature of the training was actually a benefit in terms of comparing ideas:

> There was a mixture of primary, but I think there may have been a couple of secondary teachers as well, which was actually quite interesting, because then it gave you that [understanding of the discussion] of where the children go after they leave us. And know what kind of questions they might be facing now, or how other teachers approach things with them. - *Primary teacher*

Some saw the cross-phase and cross-subject aspect as a rare opportunity for teachers to come together to learn from each other's and their pupils' perspectives:

> Whereas, because this GA course was cross-phase, we just got a load of people talking to each other going, so how does what you do in primary school feed into what we do in secondary school, and you think, bingo! There we are. That's exactly what I wanted to happen. - *School-based deliverer and secondary science lead and assistant head*

One secondary geography teacher expressed how having primary teachers at the same CPD session was more beneficial than other secondary teachers:

> There was quite a hefty percentage of primary compared to secondary there and that was good to hear what the geography curriculum looks like in the early years, which we frequently don't get. It was nice to bounce it off some other secondary leaders, but it's the primary school connection that was the most beneficial, I think. - *Geography lead, secondary school*

Those teachers who experienced a more homogenous group did not experience these potential concerns and/or benefits.

Teachers reported that a **key enabler for implementation was the CTfA CPD providing a variety of activities that were simple and easy to implement,** such as ‘flat chat’ and ‘question generator’, where teachers needed minimal resources and preparation to run the activity. Successful implementation of the learning from the CTfA CPD was predominantly attributed to the course offering these practical, easy to implement activities that could be used 'off the shelf' with pupils:

> I think in life you’re looking for something that’s useful, particularly when you’re busy. And they weren’t massive things, but there were lots of things where you think, ‘oh, I could use that there, use that there, and that would make a difference’. - *Primary science coordinator*

> It was probably the activities that were explained to us. Some of the activities he said, ‘look I’ve tried this with my Year 9 class’. And then that’s when I thought ‘well, yeah, I quite like that, I quite like the idea of the activity’. So, it was more of the activities that he was suggesting that were beneficial, rather than the actual critical thinking element to the course. - *Primary science coordinator*

The activities were praised by teachers as being accessible to pupils and could be implemented across topics without excessive planning on the part of the teacher, which one participant noted, teachers '*do not have the time or headspace for*'. The project sessions being practical allowed teachers to see how activities could work in their own classroom:

> What I liked was that we trialled quite a lot of the activities ourselves. An activity was explained and then we were given a chance to actually physically do it. You learn it more when you do it, don’t you? - *Primary assistant head*

Discussions with other teachers throughout the sessions also allowed teachers to talk through how to tailor to different age groups and topic areas.

One teacher commented on the importance of the critical thinking aspect of the course being contextualised within geography and science. This teacher explained how staff in their school had previously attempted to implement critical thinking into lessons, but found their pupils had struggled without the subject contextualisation.

Teachers attending training, the GA PM, and deliverers all emphasised that the '*plan, do, review*' nature of the CTfA CPD was central in leading to change, i.e. teachers going away and doing the 'do' phase (gap task), and then presenting and reflecting on this in the last CPD session. This process was reported to be important to lead to learning from the training:

> I think, again, the important thing with it was that gap task, because it's all very well to sit down and come across these strategies and say, 'well that's a brilliant idea, we could do that', but then if you're not forced to sit down and do it, plan it and then deliver it, it just sort of fades away. So, I think the gap task was really key. - *Primary teacher*

> Because it does enable you to get up off your backside and have a go, rather than say, 'right, I've done the course, now I can put that folder in a cupboard and forget about it' which some people do. - *Secondary science teacher*

The '*plan, do, review*' format was also noted as a key enabler by the PM at GA, who felt that the gap task gave teachers permission to try the approaches out and '*play around with them'* in their school context. This, the PM felt, allowed teachers to observe what worked well and less well, and then tweak approaches as needed to gain ownership. Having the gap task also meant that teachers were invested in the training, knowing they would benefit from sharing their implementation experiences with other teachers and hearing about implementation of other activities from these teachers. This model of delivery was described as *'incredibly powerful'* by the GA PM who has subsequently used the approach for other training courses offered by GA. One of the trainers felt the approach made implementation for teachers quick, easy and with instant impacts:

> You could see their faces. What!? Extra work!? But they came back, and they said 'look, it's embedded in my classroom' or 'it's embedded across the whole school now'… And you can simply just drop it in, like the question generators. Oh my goodness me – instantly you can have immediate impact with it. - *Trainer one*

Teachers agreed that the gap task added an element of accountability, which some teachers said increased their motivation to take action, knowing they would have to feed back at session two:

> I think the use of the gap task was probably the most effective thing, because people knew they had to do it, they had a time limit in which it needed to be done, and it was going to be followed up again. If they

> needed an additional motivator, then that was probably it. - *Primary teacher*

3.3.2 Factors related to the school climate/context

School-based enablers mentioned by teachers were related to the ethos of the school, for example, teachers from schools with cultures where CPD and teacher change were embraced felt that the environment for implementation was positive:

> Very supportive staff. We support each other. We do a lot of team teaching [across] the school where people can come in and look at lessons and support each other. - *Primary science lead*

> The school are really keen for us to try new things and to share them in staff meetings, which we have done, which has been really positive. For other people, to try those ideas as well and to see how we've done them. - *Case-study school 2, teacher focus group*

Similarly, **teachers cited having the freedom, responsibility, and autonomy in their role to trial activities as an enabler:**

> I'm given a lot of responsibility. I was able to basically overhaul geography and input everything over a few days, because when I started, I was the only geography teacher. - *Secondary geography teacher*

In particular, teachers talked about having the freedom within school for trial and error, without fear of negative consequences if an attempt at a new way of teaching did not appear to be successful:

> We're very lucky that [they trust us] at school. We're allowed to take risks in our classroom, and we're encouraged to try out new ideas. We don't mind if things work or don't work, we believe that having a go is really important. - *Secondary assistant head*

Senior Leadership Team (SLT) support, and other staff in the school being willing to take on board the activities was also said by teacher participants to ensure better and more consistent implementation:

> The majority of people actually have taken it on board massively and gone with it. - *Primary teacher*

Schools' contextual factors, in a small number of cases, provided challenges to the implementation of learning. This was particularly the case with priority schools, which by the nature of fitting the recruitment criteria were rated by Ofsted as needing to improve. They often had other challenges to deal with, which made implementation more difficult, regardless of the quality of the project. For example, schools in challenging circumstances were often more likely to prioritise English and mathematics, meaning humanities subjects were given less attention or resource:

> The only thing is, like I said before, it's about the pressure – we're under a lot of pressure at the moment, being double RI, to get our attainment to be as good as it can be. So, we're [ploughing] a lot of time into the English and the maths and it's just finding the time to give the foundation subjects the quality they deserve. - *Primary key stage 2 leader*

One teacher, from a school in an area with an intake of pupils from economically-deprived backgrounds, felt that there would be limitations on how far the learning from the project could impact upon certain pupils:

> When you've got a class full of kids that probably haven't eaten that day and they're going home to some pretty horrific things in their home life, they're probably not going to be as able to or willing to partake in it. A lot of them, their parents don't necessarily read to them... so they haven't got the basis of the knowledge. So, I found the course was able to enhance students' debating skills and questioning skills, but for those students that have very, very, very limited skills, I found that it was too high level for them. - *Secondary geography teacher*

Other teachers shared different potential barriers related to pupils' future aspirations being low, and working with pupils with specific needs:

> Children with a range of needs coming from a range of family backgrounds really. So, we do deal with a lot of emotional and behavioural problems within our school as well… That often takes priority sometimes before we can actually do any of the academic educational side of things. - *Primary teacher*

Schools generally also had to deal with high staff turnover, preparation for Standard Assessment Tests (SATs) and Ofsted inspections and intakes of high proportions of pupils with special needs and English as an additional language. Linked to other

demands on their time, some teachers also commented on a lack of time to implement and disseminate their learning:

> I suppose in terms of how well it's been implemented, it's literally just the fact that I feel like I'm a one-man band with a little bit of extra help. I think that's the biggest challenge – having non-specialists and having limited contact time with them to disseminate this information. - *Geography lead, secondary school*

Having the whole school attend training (where schools hosted) was seen to be an enabler for the school's future implementation as all or most teachers received the training:

> And they're [the staff] happy to use [the resources], because they're confident in what they're using, because they've had hands-on experience of doing it on the course, and then they've been able to just take it away and implement it themselves. - *Primary assistant head*

> It becomes more of a revolution then, because you deliver it to the whole staff, so they've got a common language that they can share, and when one of them goes off and tries something, [they'll be] at lunch time saying 'oh, I tried that 'flat chat', it was brilliant'... - *Trainer one*

To a slightly lesser degree, this wider implementation could also be achieved by more than one teacher from a single school attending training, as this helped to compare implementation in different contexts (i.e. year groups or subjects) within the same school, described by the trainer as having *'a much greater impact for a slightly higher investment'* (Trainer two).

4 Perceived outcomes and impacts of the provision

This section considers the extent to which the CTfA project achieved its intended project outcomes and impacts (See Appendix A) as well as the **perceived** contribution it made to the TLIF programme's intended impacts. It draws on qualitative data, exploring different stakeholders' perceptions of the outcomes of the project, and providing context for interpretation of these, and secondary analysis of SWC data to report changes in teacher retention and progression.

The analysis of impact on teacher retention and progression utilises a comparison group design. This enables us to estimate counterfactual retention outcomes for teachers, and infer whether or not changes in teacher retention and progression might have happened in the absence of the CTfA project.

Please note that, **as the evaluation design does not include surveys, we are unable to provide a quantitative survey measure of the relationship between the project and any reported outcomes. The outcomes reported here are based on perceptions data and, therefore, should be regarded as illustrative rather than conclusive.**

4.1 TLIF and bespoke project outcomes and impacts

The qualitative interviews/case studies primarily explored perceptions of the project-specific outcomes of involvement in the project on different stakeholder groups (direct participants, other school staff, pupils) and on the wider school, and gathered perceptions of achievement of Fund-level project outcomes relevant to the CTfA project. The qualitative data was also analysed to explain the reasons for these findings.

Table 1 sets out the intended CTfA project outcomes and impacts as agreed with the CTfA at the beginning of the project.

Table 1: CTfA intended outcomes and impacts for teachers

Outcomes and Impacts	Outcome or Impact
• Subject knowledge (key competency)	Outcome
• Subject pedagogical knowledge (key competency)	Outcome
• Knowledge/understanding of using evidence to inform practice (key competency)	Outcome
• Increased capacity for delivering knowledge-rich pedagogy	Outcome
• Increased demand for career-long CPD	Outcome

Outcomes and Impacts	Outcome or Impact
Manage workload and wellbeing	
• Time recuperated through effective curriculum planning	Outcome
• Networks reduce feelings of isolation and increase peer-peer support	Outcome
Build confidence and improve retention	
• Improved teacher confidence & capacity in effective subject-specific pedagogy	Outcome
• Improved teacher satisfaction and motivation to remain within the profession	Outcome

Table 2: CTfA intended outcomes and impacts for schools

Outcomes and impacts	Outcome or Impact
• Increased CPD (geography and science)	Outcome
• Improved quality and effectiveness of geography and science teaching in schools facing challenges	Outcome
• Increased school capacity for delivering knowledge-enriching pedagogy and for planning appropriate curriculum challenge	Outcome
• Experience gained in supporting network activity at school level	Outcome
• Perceptions of improved recruitment of science and geography teachers	Outcome
• Improved progression & retention of science and geography teachers	Impact

Table 3: CTfA intended outcomes and impacts for pupils

Outcomes and impacts	Outcome or Impact
• Increased pupil engagement with complex issues	Outcome
• Increased pupil engagement with social and natural science investigation	Outcome
• Improved pupil attainment	Impact
• Increased take up of geography and science at GCSE and A-level	Outcome

Table 4: Wider outcomes; local area and systems change

Outcomes and impacts	Outcome or Impact
• Networking between schools to encourage knowledge exchange	Outcome
• New networks are sustained through national support	Impact

Findings are reported thematically, though grouped as in the table above for meaningful reporting. They explore the extent to which there was evidence of progress to project-specific outcomes and the contribution of the project to achieving TLIF mediating outcomes.

4.1.1 Findings related to project-specific teacher outcomes

Participants were asked to discuss the impacts of the CTfA CPD on subject knowledge and subject-specific pedagogy. **Teachers reported a positive impact on their pedagogy, but little to no impact on their subject knowledge.** The quote below is typical of a response:

> I didn't actually come back knowing much more about geography. I came back with really exciting ways to implement geography in the school. - *Primary teacher*

Participants discussed feeling somewhat reinvigorated by the training with a new range of strategies and pedagogical ideas to try out in their class. Being able to support pupils to develop a *deeper* understanding of topics was cited as a particular pedagogical benefit, as well as improved techniques to break down learning into smaller chunks:

> One thing I took away from it was the need to address misconceptions and developing deeper questions – from the students not just me asking questions. So, moving from very basic what/where/how to the more developed questions and using the question grid. - *Secondary Geography teacher*

Using the activities from the CTfA CPD had enabled teachers to tailor their teaching on topics to meet pupils' needs and areas for development:

> So, my lessons are now going to look like this, because I know what they already know, I know where the gaps are, and instead of just teaching scheme of work lesson 1, 2, 3, 4, 5, I can go – OK, we can adapt this lesson, we can skip that lesson, we can bring something else in that they don't know. I was able to really adapt the scheme to their needs. - *School-based deliverer, and secondary science lead and assistant head*

Teachers talked about the learning from the CTfA CPD enabling them to plan pupil-led lessons, giving pupils more responsibility for their own learning through more inquiry-based lesson plans; for example, through allowing pupils to explore sources of data, generate questions and debate topics.

Teachers described how they had embedded critical thinking elements into their teaching to encourage pupils to think more deeply in general, looking at 'how' and 'why' questions, and encouraging pupils to think from others' points of view, through a deeper engagement with opposing perspectives on a subject. The quote below illustrates this level of engagement within a specific area of history:

> Certainly, in upper Key Stage 2 we both used it in history topics…We went deeper and we said 'well looking at what we've done so far, would you rather be an Athenian or a Spartan? and how would you argue that your city-state is the best? What counter-arguments would you anticipate from your opposition, and how would you deal with them?' And it built up, little by little, detailed arguments. I was very impressed. They really got the idea and they got quite into it as well. It engaged them more by going deeper, because – the DfE should know this – too often, the pressure on the curriculum means that you never actually go beneath the surface, because you're expected to do so much, you actually have to make time to get that deeper understanding sometimes. So, I think it was great to do that.
> - *Primary Key Stage 2 leader*

A number of participants described how they had been able to allow pupils more independence in learning**.** For example, instead of *'spoon feeding'* knowledge to pupils*,* teachers felt that the training had given them the confidence allow pupils time to think and work things out for themselves:

> I think they're more aware of the need to not just impart knowledge to children, but give them the skills and the understanding of how their brain works in order for them to think independently themselves.
> - *Primary teacher*

> Often now at the beginning of the lesson… it's finding ways of getting them to bring out either what they want to find out and more inquiry-led lessons rather than this is all the information about this. So, for example, we're doing China at the minute. Yesterday I did a geography lesson, but rather than saying this is what we're going to find out and this is what the information is, I got them to write questions about what they want to find out about China. Then they went off and enquired and found out about what they wanted to find out about. So, I think they're finding it more interesting that way.
> - *Primary teacher*

This way of conducting a lesson, teachers felt, led to a level of ownership for pupils and helped with engagement and productivity in the classroom.

Putting the emphasis on pupil-led learning was also commented on by the head teacher in case-study school 1 (see vignette two below). This head teacher felt that geography specifically as a subject, was now taught '*much better'* with a higher expectation on teachers, and commented on the improvement of the quality of teaching in the school being attributable, at least in part, to the GA CPD:

> There's obviously loads and loads of factors in that, isn't there? Our Ofsted – two years ago we were RI and that's when we first made the contact, because when you go into RI suddenly there's actually quite a bit at your disposal. And now we're Good…Our geography was looked at as part of our Ofsted inspection… there's concrete evidence [of improvement] there. - *Head teacher, case-study school 1*

Teachers also reported being more confident to introduce more complex ideas and to ask pupils more critical questions, such as why they thought a certain way about a topic or issue:

> I think it's given me more confidence to try more complex thinking with my students. - *Secondary assistant head*

Teachers tended to answer 'yes' when asked if they felt more valued due to having this CPD opportunity, reporting that they were pleased to have had the chance to attend subject-specific CPD, which they may not have been able to access for a number of years previously due to the cost of CPD, or a school-based priority on core subjects:

> I came away very happy and satisfied that I'd had that opportunity, despite that I had to drive for an hour to go to it and it was the last day of term, but actually it was really, really good. - *Secondary geography lead*

> Yes. Definitely. The way that it was taught to me by the tutor at Sheffield was really fantastic, because it was a lot of personal teaching ideas that I knew that I could definitely use in the classroom and adapt for my own practice, without having to think too far-fetched how I could mould it to my subject, which often you do get. Most CPD is quite maths and English focused. So yes, definitely. - *Secondary teaching school lead*

Some teachers also reported increased satisfaction in their role, as the project had provided a renewed enthusiasm for teaching:

> It's been really the time to maybe think and develop your ideas and practice, because often you just get… not stuck in a rut, but you just do things the way that you've always done things maybe. So, to have that time to either reflect on how to deliver something or how to maybe do something that will be more engaging or get the children to think on that deeper level, which is what we want, has been really good. And just new ideas and new ways to do something, that I haven't really thought of before. - *Primary teacher*

There was very limited evidence of increased use of evidence to inform practice on the part of teachers. A small number of teachers stated they already used evidence-informed teaching, and a small number said this was something that they found difficult. On the whole teachers were not able to comment on any changes related to evidence-informed teaching.

Subject leaders who took part in the evaluation agreed that the training had helped them in their role, enabling dissemination of what they considered valuable knowledge

to other science and geography teachers in the school, and in some case teachers across other subjects:

> It's helped me to see things from a whole-school perspective and to know that there are strategies out there that can be used as whole-school not just in one key stage. So, in my own particular role it's been great, in that way, in the leadership part of it. - *Primary assistant head*

A school-based deliverer had found the training particularly helpful, in that it offered a set of techniques that could be useful in specific contexts to support pupils' learning:

> That's been huge, because as I say when I go and do anything with a STEM learning hat on or an Institute of Physics hat on, I've got another set of tools that I can just go, 'ooh have you tried this with…?' you know, if you're talking specifically about pedagogy and a group of people say 'how do we engage our students? – we've got a load of disaffected white working class boys'. And you go, 'have you tried flat chat?' And they go, 'ooh what's that?', 'Oh have you tried these questioning grids', 'Oh, what are they?' There are things that you can just pepper into little bits of conversations. - *School-based deliverer, and secondary science lead and assistant head*

Owing to time constraints, the interviews did not allow for discussion on **time recuperated through effective curriculum planning,** although teachers often talked about using the CTfA activities in their planning. Only a small number of teachers commented on **reduced feelings of isolation and increased peer-peer support** as an outcome of the CTfA CPD.

There were mixed findings as to whether teachers linked their involvement in the CTfA project with intentions to stay in teaching. We discuss these findings in greater detail in Section 4.1.2, alongside the findings from the analysis of SWC data into the impact of FPL on teacher retention and progression.

4.1.2 Findings related to fund-level and project-level impacts

This section explores the extent to which the CTfA project achieved its impacts in relation to teacher retention and progression (through analysis of teacher outcomes in the SWC). It also explores participants' perceptions of the impact of the project on teacher retention and progression (through analysis of qualitative data).

Retention and progression analysis

The evaluation aimed to explore the impact of the CTfA project on the fund-level goals to improve teacher retention and progression. As outlined previously, the CTfA project intended to achieve both teacher-level and whole-school level impacts. Therefore, this analysis is conducted on CTfA participants and a matched comparison sample of teachers (teacher-level impacts), and on all teachers from CTfA schools (whole-school impacts). As such, the finding are reported in two sections; one reporting impact the CTfA project had on teacher-level retention and progression and one section using school-level data to explore the impact CTfA had on school level retention and progression.

The analysis uses the set of CTfA participants compared to a non-CTfA teachers matched on a range of key characteristics (see Appendix B) to estimate what counterfactual retention and progression rates might have been with and without the CTfA project. Teacher retention was analysed in terms of:

- retention in the state-funded sector in England
- retention in the school
- retention in the same LA
- retention in challenging schools

Teacher progression was analysed in terms of:

- progression in the state-funded sector in England
- progression in the school
- progression in the same LA
- progression in challenging schools

As findings of teacher level retention/progression were statistically significant, subsample analysis was also conducted, to be able to differentiate findings between primary teachers and secondary teachers (Appendix G). This also reflects the inclusion of both primary and secondary school teachers in the project and allows exploration at the teacher level of the potential differential impact the project could have for those groups.

Teacher-level retention

The following sections discuss the findings of the SWC secondary analysis at the teacher level. The tables below summarise CTfAs estimated impacts across the four retention measures analysed.

Retention in the state-funded sector in England

Table 5: Difference in the estimated rate of retention in state-funded teaching in England between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated retention rate in state-funded teaching 1 year after baseline (%)	95.4	90.3	5.0	Yes
Number of teachers	**984**	**7861**		
Estimated retention rate in state-funded teaching 2 years after baseline (%)	92.7	85.3	7.3	Yes
Number of teachers	**910**	**7277**		

Note: Estimated retention rates are the average predicted retention rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Analysis presented in Table 5 shows that the CTfA project was associated with a statistically significant higher rate of retention within the state-funded teaching profession; with treatment teachers 5.0 and 7.3 percentage points more likely to be retained in teaching one and two years, respectively, after the baseline data was collected. This suggests that the CTfA project had a positive impact on teacher retention in the profession.

The subsample analysis of primary and secondary teachers independently (tables in Appendix G) shows that the positive impact in retention observed was for primary school teachers only, and not secondary school teachers. However, the presence of such a significant impact only one year after baseline suggests that there may have been systematic differences between the treatment and comparison samples that are not accounted for in this analysis. Therefore, whilst the analysis suggests a positive impact, this may be inflated by systematic differences between treatment and comparison teachers that we could not account for.

Retention in the school

Table 6: Difference in the estimated rate of retention in the same school between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated retention rate in the same school 1 year after baseline (%)	97.5	92.2	5.3	Yes
Number of teachers	**878**	**7094**		
Estimated retention rate in the same school 2 years after baseline (%)	94	87.9	6.1	Yes
Number of teachers	**814**	**6598**		

Note: Estimated retention rates are the average predicted retention rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

The analysis in Table 6 shows that there was a statistically significant difference in the estimated rate of retention within the same school they were in at baseline between treatment teachers and matched comparison teachers. Specifically, the estimated retention rate within the same school for treatment teachers was 5.3 percentage points higher than for the comparison groups one year after baseline and 6.1 percentage points higher after two years. Again, when looking at the findings from subsample analysis (Appendix G) the higher retention rate was specifically related to primary school teachers, and not secondary school teachers. However, again, the presence of such a significant impact only one year after baseline suggests that there may have been systematic differences between the treatment and comparison samples that are not accounted for in this analysis. Therefore, whilst the analysis suggests a positive impact, this may be inflated by systematic differences we could not account for.

Retention in the same local authority

Table 7: Difference in the estimated rate of retention in the same local authority district (LAD) between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated retention rate in the same LAD 1 year after baseline (%)	98.2	95.8	2.4	Yes
Number of teachers	**878**	**7094**		
Estimated retention rate in the same LAD 2 years after baseline (%)	95.9	93.1	2.8	Yes
Number of teachers	**814**	**6598**		

Note: Estimated retention rates are the average predicted retention rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Analysis in Table 6 shows that the CTfA project was associated with a higher retention rate of teachers within the same LAD. Specifically, the retention rate within the same LAD for treatment teachers was 2.4 percentage points higher than for comparison teachers after one year and 2.8 percentage points after two years. Again, when looking at the findings from subsample analysis (Appendix G) the higher retention rate was specifically related to primary school teachers, and not secondary school teachers.

Retention in challenging schools

Table 8: Difference in the estimated rate of retention in challenging schools[8] between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated retention rate in challenging schools 1 year after baseline (%)	98.6	94.5	4.1	Yes
Number of teachers	**875**	**7016**		
Estimated retention rate in challenging schools 2 years after baseline (%)	96.4	91.5	4.9	Yes
Number of teachers	**806**	**6481**		

Note: Estimated retention rates are the average predicted retention rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Analysis in Table 8 shows that there was statistically significant difference between the retention rate in challenging schools for treatment and comparison teachers. Treatment teachers were 4.1 percentage points more likely to remain in challenging schools than comparison teachers after one year and 4.9 percentage points more likely at two years. Subsample analysis demonstrated that the significance in retention rate in challenging schools was observed for primary school teachers (at both year one and year two) and secondary school teachers. (at year two only).

Findings presented above provide evidence to suggest that the CTfA project had a positive effect on retention for primary school teachers across all measures of retention. The picture for secondary school teachers was not as clear with retention only in challenging schools significant two years after baseline. However, as detailed above, the estimated impact on retention that the CTfA project has had may be inflated by systematic differences between treatment and comparison teachers that could not be accounted for in the analysis. For example, teachers who were already committed to developing their career within teaching may have been more likely to join the project than teachers considering leaving the profession, their school or local authority district. This is

[8] For the purposes of this analysis, 'challenging' schools were defined as schools rated by Ofsted as 'requires improvement' or 'inadequate'. A teacher was defined as remaining in a challenging school if they either stayed within the school they were in at baseline, or moved to another school which was rated 'requires improvement' or 'inadequate'.

supported by qualitative findings as some teachers were hesitant to say that the project had impacted on their likelihood of staying in teaching. Specifically, when asked about whether the project had impacted upon their decision to remain in teaching, **teachers were not consistently able link the project to their retention decisions**:

> It was incredibly useful, but I haven't thought I'm going to definitely stay in teaching now or I'm going to quit because of it. It's not been a decisive factor in my future career trajectory. - *Secondary geography teacher*

> Wow – they are some pretty big potential impacts. No. I think some of those are pretty out there to have achieved from this kind of thing. - *Secondary teaching school lead*

Others felt that the project was a positive factor that helped with their satisfaction, along with other factors, and, therefore, their intention to remain teaching:

> I would say on a personal level it reinvigorated my love for geography. I think so much of my job is not about that, so it was really nice to actually be reminded of the fact that I do love geography and I do love teaching pupils. - *Secondary humanities lead*

In summary, the findings discussed above suggest that the CTfA project may have been, at the teacher level, successful in contributing to improved retention. This was more evident in primary schools than secondary schools and can be seen to increase across the course of two years. It is, however, important to consider that there are several factors that could not be accounted for in the analysis that may have inflated this finding.

Teacher-level progression

Progression in the state-funded sector in England

The tables below summarise the CTfA impacts across the four progression measures analysed. Progression rates are defined as the proportion of teachers who moved from either a classroom teacher to a middle/senior leader role, or a middle leader role to a senior leader role within one and two years of baseline.

Table 9: Difference in the estimated rate of progression in state-funded teaching in England between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in state-funded teaching 1 year after baseline (%)	2.2	2.7	-0.6	No
Number of teachers	**878**	**7094**		
Estimated progression rate in state-funded teaching 2 years after baseline (%)	5.3	4.5	0.8	No
Number of teachers	**814**	**6598**		

Note: Estimated progression rates are the average predicted progression rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

The analysis displayed in Table 9 shows that there were no significant differences in the progression rates of treatment and comparison teachers who stayed in teaching, either one or two years after baseline. These findings suggest that the CTfA project had little impact on progression in teaching for science and geography teachers generally. When examining the findings from subsample analysis (split between primary and secondary teachers – Appendix G), a significant difference in progression for primary school teachers could be observed at year one only. Primary teachers in treatment schools were 1.2 percentage points *less* likely to progress than those in comparison schools (Appendix G).

Progression in the school

Table 10: Difference in the estimated rate of progression in the same school between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in the same school 1 year after baseline (%)	2.1	2.3	-0.2	No
Number of teachers	**854**	**6538**		

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in the same school 2 years after baseline (%)	4.5	3.7	0.9	No
Number of teachers	**762**	**5826**		

Note: Estimated progression rates are the average predicted progression rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

The analysis shown in Table 10 shows that there were no significant differences in the progression rates of treatment and comparison teachers who stayed in the same school, either one or two years after baseline. When examining the findings from subsample analysis (split between primary and secondary teachers), a significant difference in progression for primary school teachers could be observed at year one only. Primary teachers in treatment schools were 0.7 percentage points *less* likely to progress than those in comparison schools.

Progression in the same local authority

Table 11: Difference in the estimated rate of progression in the same local authority district (LAD) between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in the same local authority 1 year after baseline (%)	2.2	2.5	-0.3	No
Number of teachers	**861**	**6783**		
Estimated progression rate in the same local authority 2 years after baseline (%)	4.9	4.0	0.9	No
Number of teachers	**778**	**6152**		

Note: Estimated progression rates are the average predicted progression rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

The analysis displayed in Table 11 shows that there were no significant differences in the progression rates of treatment and comparison teachers who stayed in the same LAD, either one or two years after baseline. When examining the findings from subsample analysis (split between primary and secondary teachers), a significant difference in progression for primary school teachers could be observed at year one only. Primary teachers in treatment schools were 1.0 percentage points *less* likely to progress than those in comparison schools.

Progression in challenging schools

Table 12: Difference in the estimated rate of progression in challenging schools[9] between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in challenging schools 1 year after baseline (%)	2.1	2.4	-0.3	No
Number of teachers	**862**	**6637**		
Estimated progression rate in challenging schools 2 years after baseline (%)	4.9	3.8	1.1	No
Number of teachers	**776**	**5951**		

Note: Estimated progression rates are the average predicted progression rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

The analysis shown in Table 12 demonstrates that there were no significant differences in the progression rates of treatment and comparison teachers who stayed in challenging schools, either one or two years after baseline. However, when examining the findings from follow on subsample analysis (findings are split between primary and secondary teachers), a significant difference in progression for primary school teachers could be

[9] For the purposes of this analysis, 'challenging' schools were defined as schools rated by Ofsted as 'requires improvement' or 'inadequate'. A teacher was defined as progressing in a challenging school if they moved to a middle/senior leadership position from a classroom teaching position or a senior leadership position from a middle leadership position *and* either stayed in their baseline school or moved to a challenging school.

observed at year one only. Primary teachers in treatment schools were 0.8 percentage points *less* likely to progress than those in comparison schools (Appendix G).

In summary, there is no evidence to suggest that CTfA had an impact on teachers' progression from teacher to middle leader or middle leader to senior leader. The finding across all the progression measures was in fact that primary level participant teachers were less likely to have progressed than those in comparison schools. It is unclear how participation in the programme could lead to teachers being less likely to progress in primary schools. As some teachers reported increased satisfaction in their role, and that the project had provided a renewed enthusiasm for teaching, it could be speculated that the increase in their level of satisfaction had resulted in teachers staying within that role. However, further work would need to be done to understand this finding further.

In addition, as acknowledged in section 4.1, the CTfA project focused specifically on geography and science in primary and secondary school. It is possible that the project led to progression in roles, but these may have not been recorded in the SWC. For example, movement from teacher to subject leader in a primary school would not be captured in the SWC unless accompanied by a teaching and learning responsibility (TLR) payment.

School-level retention

The following sections explore the findings from the SWC secondary analysis on retention at the school level (school-level impacts). As there were no significant findings when looking at both primary and secondary teacher collectively, these findings are not reported for primary and secondary teachers separately.

Retention in the state-funded sector in England

Table 13: Difference in retention in state-funded teaching in England

	Treatment group	Comparison group	Difference	Difference-in-difference	Statistically significant?
Estimated retention rate in state-funded teaching 3 years before baseline (2015 to 2016)	91.4	91.6	-0.2	-	-

	Treatment group	Comparison group	Difference	Difference-in-difference	Statistically significant?
Estimated retention rate in state-funded teaching 2 year before baseline (2016 to 2017)	92.2	91.4	0.8	-	-
Estimated retention rate in state-funded teaching 1 year before baseline (2017 to 2018)	93	92.1	0.9	-	-
Estimated retention rate in state-funded teaching 1 year after baseline (2018 to 2019)	92.7	92.1	0.6	0.1	No
Estimated retention rate in state-funded teaching 2 years after baseline (2019 to 2020)	92.6	93.1	-0.5	-1.0	Yes
Number of schools	**321**	**2260**	-	-	-

Note: Estimated retention rates are the average predicted retention rates from a logistic mixed-effects regression model for treatment and comparison schools, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of these differences is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison schools.

The analysis shown in Table 13 reveals one statistically significant finding. The difference between treatment and comparison schools two years after baseline was significantly greater than compared to before the project started. Before the project, treatment schools had higher retention rates in state-funded teaching than comparison schools by an average of 0.5 percentage points. Two years after baseline, teachers in treatment schools were 0.5 percentage points less likely to remain state-funded teaching than teachers in comparison schools. This difference appears to have been caused by a notable increase in the retention rate in comparison schools in this year (rather than the difference being caused by a change in treatment schools).

Retention in the school

Table 14: Difference in rate of retention in the school

	Treatment group	Comparison group	Difference	Difference-in-difference	Statistically significant?
Estimated retention rate in the same school 3 years before baseline (2015 to 2016)	91.5	91.5	0.0	-	-
Estimated retention rate in the same school 2 year before baseline (2016 to 2017)	92.6	92.3	0.3	-	-
Estimated retention rate in the same school 1 year before baseline (2017 to 2018)	92.9	92.7	0.2	-	-
Estimated retention rate in the same school 1 year after baseline (2018 to 2019)	94.6	93.7	0.9	0.7	No
Estimated retention rate in the same school 2 years after baseline (2019 to 2020)	95.9	95.6	0.3	0.1	No
Number of schools	**321**	**2260**	-	-	-

Note: Estimated retention rates are the average predicted retention rates from a logistic mixed-effects regression model for treatment and comparison schools, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of these differences is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison schools.

The analysis displayed in Table 14 does not demonstrate any differences in retention rate within the same school between treatment and comparison schools.

Retention in the same LA

Table 15: Difference in rate of retention in the same LA

	Treatment group	Comparison group	Difference	Difference-in-difference	Statistically significant?
Estimated retention rate in the same LA 3 years before baseline (2015 to 2016)	95.6	95.2	0.4	-	-
Estimated retention rate in the same LA 2 years before baseline (2016 to 2017)	96.3	95.8	0.5	-	-
Estimated retention rate in the same LA 1 year before baseline (2017 to 2018)	96.1	95.8	0.3	-	-
Estimated retention rate in the same LA 1 year after baseline (2018 to 2019)	97.1	96.4	0.7	0.3	No
Estimated retention rate in the same LA 2 years after baseline (2019 to 2020)	97.7	97.4	0.3	-0.1	No
Number of schools	**321**	**2260**	-	-	-

Note: Estimated retention rates are the average predicted retention rates from a logistic mixed-effects regression model for treatment and comparison schools, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of these differences is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison schools.

The analysis displayed in Table 15 does not demonstrate any differences in the retention rate in the same LA between treatment and comparison schools.

Retention in challenging schools

Table 16: Difference in rate of retention in challenging schools[10]

	Treatment group	Comparison group	Difference	Difference-in-difference	Statistically significant?
Estimated retention rate in challenging schools 3 years before baseline (2015 to 2016)	94.2	94.5	-0.3	-	-
Estimated retention rate in challenging schools 2 year before baseline (2016 to 2017)	95.7	95.2	0.5	-	-
Estimated retention rate in challenging schools 1 year before baseline (2017 to 2018)	95.6	95.5	0.1	-	-
Estimated retention rate in challenging schools 1 year after baseline (2018 to 2019)	96.6	96.0	0.6	0.5	No
Estimated retention rate in challenging schools 2 years after baseline (2019 to 2020)	97.4	97.2	0.2	0.1	No
Number of schools	**321**	**2260**			

Note: Estimated retention rates are the average predicted retention rates from a logistic mixed-effects regression model for treatment and comparison schools, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of these differences

[10] For the purposes of this analysis, challenging schools were defined as schools rated by Ofsted as 'requires improvement' or 'inadequate'. A teacher was defined as remaining in a challenging school if they either stayed within the same school, or they moved to a different school which was rated 'requires improvement' or 'inadequate'.

is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison schools.

The analysis displayed in Table 16 does not demonstrate any differences in retention rate in the same LA between treatment and comparison schools.

In summary, there is no evidence to suggest that the CTfA project had an impact on retention at the school-level. The generally non-significant findings on retention at the school level contrasts with the significant findings at the teacher level. This difference could be explained by the fact that GA/ASE did not manage to recruit many teachers from the same school, meaning that for some schools there may only be one teacher recruited. Therefore, in these cases it is unlikely that participation in the project would have impacted on school level retention rates. Furthermore, the success of wider-school impacts was dependent upon how and when the teachers that had participated in the CTfA project shared their learning.

School-level progression

The following sections explore the findings from the SWC secondary analysis on progression at the school level (school-level impacts).

Progression in the state-funded sector in England

Table 17: Difference in progression in state-funded teaching in England

	Treatment group	Comparison group	Difference	Difference-in-difference	Statistically significant?
Estimated progression rate in state-funded teaching 3 years before baseline (2015 to 2016)	2.6	2.6	0.0	-	-

	Treatment group	Comparison group	Difference	Difference-in-difference	Statistically significant?
Estimated progression rate in state-funded teaching 2 years before baseline (2016 to 2017)	2.6	2.7	-0.1	-	-
Estimated progression rate in state-funded teaching 1 year before baseline (2017 to 2018)	2.3	2.3	0.0	-	-
Estimated progression rate in state-funded teaching 1 years after baseline (2018 to 2019)	1.7	2.0	-0.3	-0.3	No
Estimated progression rate in state-funded teaching 2 years after baseline (2019 to 2020)	1.9	1.7	0.2	0.2	No
Number of schools	**321**	**2260**	-	-	-

Note: Estimated progression rates are the average predicted progression rates from a logistic mixed-effects regression model for treatment and comparison schools, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of these

differences is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison schools.

The analysis displayed in Table 17 does not demonstrate any differences between treatment and non-treatment schools in relation to teacher progression in state-funded schools.

Progression in the school

Table 18: Difference in rate of progression in the school

	Treatment group	Comparison group	Difference	Difference-in-difference	Statistically significant?
Estimated progression rate in the same school 3 years before baseline (2015 to 2016)	5.2	5.3	-0.1	-	-
Estimated progression rate in the same school 2 years before baseline (2016 to 2017)	5.3	5.7	-0.4	-	-
Estimated progression rate in the same school 1 year before baseline (2017 to 2018)	4.9	4.8	0.1	-	-
Estimated progression rate in the same school 1 years after baseline (2018 to 2019)	3.6	4.3	-0.7	-0.5	No

	Treatment group	Comparison group	Difference	Difference-in-difference	Statistically significant?
Estimated progression rate in the same school 2 years after baseline (2019 to 2020)	3.7	3.8	-0.1	0.1	No
Number of schools	**317**	**2246**	-	-	-

Note: Estimated progression rates are the average predicted progression rates from a logistic mixed-effects regression model for treatment and comparison schools, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of these differences is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison schools.

The analysis displayed in Table 18 does not demonstrate any differences between treatment and non-treatment schools in relation to teacher progression in the same school.

Progression in the same LA

Table 19: Difference in rate of progression in the same LA

	Treatment group	Comparison group	Difference	Difference-in-difference	Statistically significant?
Estimated progression rate in the same LA 3 years before baseline (2015 to 2016)	2.2	2.2	0.0	-	-
Estimated progression rate in the same LA 2 years before baseline (2016 to 2017)	2.3	2.3	0.0	-	-

	Treatment group	Comparison group	Difference	Difference-in-difference	Statistically significant?
Estimated progression rate in the same LA 1 year before baseline (2017 to 2018)	2.1	1.9	0.2	-	-
Estimated progression rate in the same LA 1 year after baseline (2018 to 2019)	1.6	1.7	-0.1	-0.2	No
Estimated progression rate in the same LA 2 years after baseline (2019 to 2020)	1.6	1.5	0.1	0.0	No
Number of schools	**318**	**2252**	-	-	-

Note: Estimated progression rates are the average predicted progression rates from a logistic mixed-effects regression model for treatment and comparison schools, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of these differences is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison schools.

The analysis displayed in Table 19 does not demonstrate any differences between treatment and comparison schools in terms of teacher progression in the same LA.

Progression in challenging schools

Table 20: Difference in rate of progression in challenging schools[11]

	Treatment group	Comparison group	Difference	Difference-in-difference	Statistically significant?
Estimated progression rate in challenging schools 3 years before baseline (2015 to 2016)	2.1	2.1	0.0	-	-
Estimated rate of progression in challenging schools 2 years before baseline (2016 to 2017)	2.3	2.3	0.0	-	-
Estimated rate of progression in challenging schools 1 year before baseline (2017 to 2018)	1.9	1.9	0.0	-	-
Estimated progression rate in challenging schools 1 year after baseline (2018 to 2019)	1.4	1.7	-0.3	-0.3	No

[11] For the purposes of this analysis, challenging schools were defined as schools rated by Ofsted as 're-quires improvement' or 'inadequate'. A teacher was defined as progressing in a challenging school if they moved to a middle/senior leadership position from a classroom teaching position or a senior leadership po-sition from a middle leadership or classroom teaching position *and* stayed within the same school or moved to a different challenging school.

	Treatment group	Comparison group	Difference	Difference-in-difference	Statistically significant?
Estimated progression rate in challenging schools 2 years after baseline (2019 to 2020)	1.5	1.4	0.1	0.1	No
Number of schools	**317**	**2248**			

Note: Estimated progression rates are the average predicted progression rates from a logistic mixed-effects regression model for treatment and comparison schools, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of these differences is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison schools.

The analysis displayed in Table 20 does not demonstrate any differences between treatment and comparison schools in teacher progression in challenging schools.

In summary, there is no evidence that the CTfA project had a positive impact on progression from teacher to middle leader or middle leader to senior leaver at the school level. This contrasts with the findings at the teacher level, in which primary school teachers were less likely to progress that those in comparison schools. As the CTfA project focused specifically on geography and science in primary and secondary schools, it is possible that wider school impacts were less evident than in other projects with a broader subject focus. In addition, in schools where the CTfA project was not delivered to the whole school, wider school impacts were dependent on how, and to what extent, participant teachers shared their learning with the wider school.

4.1.3 Findings related to school-level project outcomes

There was variability in the extent to which other teachers in participating schools (who had not attended the project) benefited from the project, and how far their teaching had changed. As described in section 3.2, teachers had shared their learning across the schools in differing ways, meaning that any increase in teaching quality for other teachers was highly dependent on how and when the learning from the CTfA training had been passed on, and if and how this had been monitored:

> I can't measure the impact as such, but like I said before, there are things that have been shared across the school, so therefore it may well have impacted other teachers in terms of helping them to come up with different ways of planning. - *Secondary humanities lead*

> I think people are happy to have things that they can try and that they can use. And especially some of the newer teachers who are more recently qualified, because I think for them especially they need to be given ideas and ways of moving their teaching forward. - *Primary assistant head*

Teachers generally reported increased confidence in their ability to teach, which enabled them to feel that they had valuable information to pass on to colleagues. In turn, this was reported to lead to increased confidence in disseminating their learning from the project to other teachers in the school.

Although participants felt that the CTfA was high-quality CPD, it didn't appear to greatly affect their disposition towards future CPD. Teachers described how either their school already had a positive CPD culture, or that the school did not have a systematic approach to CPD due to budget and time restrictions:

> I've got to be honest – I don't think it's changed my attitude towards CPD. I enjoyed the project, but I don't think it's changed my attitude towards it though. - *Secondary geography lead*

Teachers who were not in senior positions felt they could not comment particularly on staff engagement in CPD more widely.

Perhaps linked to the CTfA project being a short CPD course, **there were very limited impacts reported related to teacher progression and intentions to remain in teaching**. Where members of the SLT did comment on teachers' careers and their retention, high-quality CPD, such as that provided by the CTfA project, was perceived to be more likely to impact over the longer-term, rather than the shorter term:

> I don't think in terms of career at this point that it's going to have that much of an impact, but I think definitely for the future for them.
> - *Primary assistant head*

There were a small number of examples of teachers who felt that the CTfA CPD had positively affected their career progression:

> I think I know where I want to go, career-wise, and I think going on courses like this and coming back as excited as I have, and implementing things straight away, helped my case for progression.
> - *Primary teacher*

> I applied for the school's Aspiring Senior Leaders programme, so as part of that letter that I had to write to apply for that, I put this in,

> sharing good practice within the department and then delivering it to the whole staff. - *Secondary geography teacher*

In addition, there was insufficient data to assess whether the school outcomes listed below were achieved.

- Improved quality and effectiveness of geography and science teaching in schools facing challenges
- Increased school capacity for delivering knowledge-enriching pedagogy and for planning appropriate curriculum challenge
- Perceptions of improved recruitment of science and geography teachers

4.1.4 Findings related to pupil project outcomes and impacts

Teachers reported an increased engagement and enthusiasm for learning in their pupils. This was attributed, in part, to pupils taking more ownership for their learning through pupil-led activities:

> Like today when we were doing about living things and [one pupil] said 'the tree isn't a living thing'. But then I didn't have to say anything, because another boy, said 'actually a tree is a living thing'. And then the boy said 'well it's not, because it doesn't have babies'. But then he explained about the seeds. And I didn't say anything. Normally it would have been, right, this is what happens; this is a living thing because it does X, Y and Z. But the children were explaining it to each other which I felt was just great. - *Primary teacher*

This perceived pupil engagement did, for some teachers, also extend to pupils' confidence and abilities in learning about complex issues:

> As it went on… the questions became more in-depth, thinking about the more complex questions. Instead of 'what is this', they were looking at 'how' do we do it, 'why' do we do it, and linking the words together, thinking of the ideas, thinking outside the box really. - *Secondary science teacher*

> Because they're starting to look at some things in more depth, they do that, and then they start to realise that they can do that, so then, when there's something else that comes up… they're more open-minded, because of being more thoughtful. And they're thinking

> about things in a more analytical way – critically analysing I suppose, on some level. - *Primary science lead*

Primary pupils in two focus groups in case-study schools were asked how the activities they were engaged with now, differed from previous lessons. Pupils from the first school agreed that being able to have their voices heard was important when learning about and discussing a particular topic:

> I think it's a good idea, because then we get to share different opinions on a topic
>
> It gives us an opinion on what we would say instead of what [they're looking for]
>
> It's nicer than having your hand up, because when you have your hand up sometimes you don't always get picked. - *Primary pupil focus group, school 1*

These comments related to activities where pupils were able to debate a particular topic compared to a more typical lesson involving teachers presenting and pupils writing in their books.

Conversely, in the second school visited, pupils expressed a preference for activities such as 'flat chat' where they were able to contribute without having the pressure of speaking out in front of their classmates, which could create some potential feelings of anxiety:

> Yeah, when you put your hand up, you feel like if you get the answer wrong, people will then laugh. But when we're doing a debate, or a silent debate, all that pressure has gone off. - *Primary pupil focus group, school 2*

Another pupil in this school commented on how this type of activity helped to build upon their existing knowledge:

> It's like a mind map and you have to jot loads of things down. And then when we discuss it at the end, there's so many things that you realise you missed out. So many things that you thought you knew, and you really didn't. - *Primary pupil focus group, school 2*

In one school, the school-based deliverer, who had undertaken the project before delivering it, had predominantly used 'flat chat' and the 'question generator' in science

teaching in their own school. This teacher was able to see an increase in confidence and engagement in pupils in science in their school, through continued use of the CTfA activities:

> One of the students, a quite disaffected young man, two weeks ago stood outside my lesson and he said, 'you know Sir Tuesday is my favourite day'. And I was like, boom! I've won! He said 'I never used to like science, but now it's like my favourite lesson and Tuesdays are brilliant'. - *School-based deliverer, and secondary science lead and assistant head*

For another pupil in the same school, this increase in pupil confidence was directly linked to their potential future career choices:

> There were lots of conversations with it being a Year 10 class around 'I can't do science. I want to be a nurse, and I'm going to get my maths and English, but I'm not going to get science'. And I was like, 'well, hold on a minute… if you're going to get a grade 5, in English and a grade 5 in maths, what's stopping you getting a grade 5 in science? Oh, it's so much learning isn't it! Well hang on a minute…', and you pull out a piece of paper that they've written on with their own words on it that you've kept and gone, 'look, what about this that you said about…?' 'Oh right, yeah maybe I can do it then'. And it's those sorts of things. With this sort of kid there's a lot of TLC anyway in terms of bolstering their confidence, but it is helping too, yes. - *School-based deliverer, and secondary science lead and assistant head*

A GA deliverer concurred that critical thinking skills in pupils were those that would be in demand by future employers:

> It's also what, in the workplace, companies want. They want people that can weigh things up, look at things, make decisions, be able to reason and justify why they've made those decisions. And as I said, the big stumbling block is the fact that many of the teachers have not had experience of this. - *Expert deliverer one*

Secondary school teachers were asked about the impacts of the project on pupils' future take up of GCSE and A-level Science and Geography. **They could not attribute a direct link between the CTfA CPD and any increase in uptake of GCSE and A-level Science and Geography,** but they could speculate that an increased enjoyment might

lead to some pupils considering these subjects more seriously than they would have done previously:

> It's tweaking what is already a good student to improve their uptake. And then perhaps, in a couple of years' time when I'm able to say that's brilliant, because that student there, who I wouldn't have expected to do, say triple science or to go on to do A-levels or whatever, is now doing it. - *School-based deliverer, and secondary science lead and assistant head*

Pupil attainment was also very difficult for teachers to measure or comment on, as noted by the GA PM:

> The measurability for us is going to be in how youngsters improve their capabilities and achieve. Certainly in geography, that's really difficult to pin down. And, therefore, we're quite reliant on teachers reporting what has improved in their classrooms. And part of that is that there is no national system of reporting attainment in geography. - *GA first PM interview*

4.1.5 Findings related to wider project outcomes: local area and system change

Teachers tended to answer yes in relation to the project offering an opportunity for them to network. **For the majority of interviewees, networking opportunities were described as providing the opportunity to listen to and share ideas related to implementation with teachers from other schools and other phases as part of the final CPD session**. Teachers found it useful to learn how other teachers were using the CTfA activities in their school and year groups. A small number of interviewees could cite more explicit examples of networking continuing outside of the project days. Two teachers had, for example, worked with a local teacher on planning and discussing their implementation. Another teacher had visited the school of a fellow CPD attendee:

> Their school this summer got outstanding results, so I was able to go visit her school to see what it is that they're doing, to see if there's anything we can learn from them in that respect. - *Secondary humanities lead*

A small number of teachers also appeared to be planning to meet up to discuss the project further:

> Well, networking… [I've just] received an email asking me to meet with other people and other colleagues from other schools, and to

> say actually we tried this one, and to see for us what Year 4 could do, and then what a Year 7 could do, what a Year 9 could do. - *Middle school humanities lead*

However, it is unclear to what extent these networks will be sustained. Owing to none of the interviewees having taken part in the 12-week extended course, there is likely to be less impact on teachers spreading learning more widely and/or establishing stronger networks.

4.2 Context and interpretation of outcomes and impacts

On the whole, there was a mixed picture in relation to the intended outcomes and impacts for this project. There was good evidence for teachers having gained pedagogical knowledge through a variety of new ways of teaching critical thinking across school phase, and to some extent subject area. There was also some evidence of the impact on quality of teaching and pupil engagement in class. There was, however, a lack of evidence suggesting any improvements in subject-specific knowledge. The reported pupil outcomes provided some confidence that there might be longer-term positive progress and attainment outcomes. The SWC analysis provided evidence that there may have been a positive impact on primary school teacher retention, with a less clear picture for secondary school teachers. There was no evidence of a positive impact on teacher-level progression, but further work would need to be undertaken to understand what this means. In addition, there was little evidence for any school-level impact arising from the CTfA project.

The CTfA project attempted to achieve fund-level and project-level impacts to improve teacher retention and progression, sustain teacher networks and improve pupil attainment. In relation to progression, it should be noted that, given the focus of the CTfA project on developing teachers' subject specific teaching and pedagogy, it would only be feasible for the project to impact directly on progression in terms of increased responsibility for, and leadership of, geography or science. Therefore, it is possible that such progression would not be captured in the analysis of progression to middle leadership posts recorded in the SWC. It is also worth highlighting that pupil impacts were explored only via teacher perceptions conveyed in qualitative responses, rather than attainment data, which was unavailable for the respective cohorts due to the Covid-19 pandemic.

Below are two vignettes detailing the experience two schools had of implementing the learning from the CTfA project in school.

Vignette three: Outcomes from implementation in a target school

Case-study school two was a primary school where the project was hosted as twilight sessions. The deputy head felt that geography was not taught as well as other subjects, which was the initial appeal of the training, however they came to realise that the project was more pedagogical in nature. The head declared that this was '*no bad thing'* and actually was more beneficial than expected:

> It was just thinking skills and it was the whole gamut of different techniques. So, it actually worked out really well for us. Serendipitous. - *Deputy head*

Teachers in the focus group in this school had appreciated the opportunity to partake in the project:

> I've been in a school recently where I had no CPD. So, this is absolutely [valued]… and it was high-quality training, so it does make you feel that you are furthering your skills as a teacher, I think. - *Primary teacher*

The implementation had been strongest in Year 6 where two teachers had worked together to plan and conduct similar lessons across different areas of the curriculum. There was discussion in the teacher focus group about changes made to teaching and planning, and one teacher explicitly stated how implementation had led to additional time saved in planning lessons:

> I think in a roundabout way it's also helped us with planning and timing as well. It's helped us reduce our workloads with planning, because to a certain extent it's there for us – we can think, we can do this, and it pieces well into what we need. - *Primary teacher*

Teachers also reflected on the benefit to students of the teacher taking a step back and allowing pupils to express themselves, discussing issues with a higher level of autonomy:

> It really has stopped me talking so much. I so want to impart knowledge…, but actually it stops me talking. As you noticed, I didn't talk at all during the debate. And I want to – but I don't. Because they've got it. They're great. - *Primary teacher*

The deputy head at the school noted the importance of the impacts of the CTfA activities on pupils who would usually struggle with more traditional teaching techniques:

> Also, it highlights some of the children sometimes who you would miss when you're looking only at books, because they have specific learning problems and they always seem to be in the bottom 20 per cent of this that or the other. But sometimes you do something oral and you're staggered at the response that you get from some of them. Kids with all kinds of emotional needs who have barriers to learning, because they don't want to write or they don't want to be disciplined about things, but actually you get them in a situation where they're putting a point of view and they're discussing something meaningful and real-world. Often those kids are quite knowledgeable and know ridiculous facts and you just think – how did you know that?! So, it does give different children a chance to shine as well. - *Deputy head*

5 Sustainability

Having the CTfA resources in a pack provided the opportunity for continued and future use:

> We got sent all the resources, so if ever there's a topic that we don't really have a lot to fall back on, I can go through and see if there's anything in the pack that could support delivering a lesson. - *Primary science lead*

> I created a critical thinking toolkit for the curriculum… I just pulled together all the things that we talked about during that day and put it together for them in a document. So, it was there and they could just refer to it whenever they needed to. - *Primary assistant head*

Teachers were keen to continue using the activities and approaches they had gained through the project:

> I'm personally embedding it into the GCSE mainly through [plenaries] but other things as well. Also, once the Year 13s come back I'm going to start building it into the A-level as well. So, yes. And I know that there's plans in science to introduce it, they were looking at the investigations and things they're doing – I think Year 8 was their focus. So, absolutely we'll take this and keep growing with it.
> - *Secondary assistant head and geography teacher*

A smaller number of teachers had completed the course only shortly before the interview took place, therefore, had not yet had a chance to share the resources or to plan in their use, but answered that they were planning to do this in the future.

When asked about sustainability, **teachers from both the case-study schools felt that having a follow-up session would perhaps be beneficial to improve sustainability, for both new staff entering the school, and staff who had undertaken the project originally**, to talk through what activities had been used so far and discuss options for more ways to implement these:

> Maybe a recap. Maybe talking through different phases. What strategies we've used, maybe could we give it a try elsewhere. I think that would probably benefit us all, if we had almost like a refresher meeting about it. - *Primary teacher, case-study school 1*

Of course, some people then leave and then you've got new people coming and they've not got experience of it so it's a matter of trying to update every so often. If there were to be refresher courses for free, that would be lovely! - *Deputy head, case-study school 2*

6 Evaluation of the GA/ASE project theory of change (ToC)

This section summarises and interprets the findings already presented in the previous sections and reviews the extent to which the GA ToC (See Section 1.1 and Appendix A) was realised in practice.

The project was delivered on the whole in line with the ToC. The CTfA appeared to have the infrastructure in place, as described in the ToC document, to carry out the project as planned. Both CPD experts and in-school deliverers were trained successfully to complete the project delivery to local groups of teachers. Existing networks of schools appeared to have been utilised where possible to recruit teachers to attend training, with some issues related to ensuring these schools met the priority criteria as described in section 2. The online portal was also outlined as part of the infrastructure, however this was not well utilised by CPD participants, who discussed going online only as a means to access resources. Teachers interviewed had been able to attend the training in full and undertake the gap task, feeding back their learning in the last CPD session in line with the 'plan, do and review' project design. There was far less uptake on the enhanced 12-week CTfA course according to the GA PM. Most interviewees were not aware of this as a possibility and felt that this would be prohibitively expensive for the school to consider.

Although the inputs were delivered as intended, and there was considerable success in achieving some outcomes, not all intended outcomes expected on completion of project delivery were achieved (see summary in section 4.2).

In particular, the ToC assumes that both enhanced subject and pedagogical content knowledge are necessary to achieve outcomes, such as improved teacher quality. As noted, while enhanced pedagogical content knowledge was reported, enhancements to subject knowledge were not, so either the assumed causal mechanism that incorporates enhanced subject knowledge needs to be reconsidered or, it is likely that the longer-term outcomes and impacts related to teachers, pupils and schools may not be fully achieved.

There was evidence to indicate the achievement of the broader fund-level outcome of retention. However, there was no evidence of improved progression.

Contextual factors, such as the learning and implementation environment, were not pertinent in the CTfA CPD, for example, there was limited obligatory engagement of school leadership; this could have been a limiting factor to achieving intended outcomes related to teacher change.

7 Learning about effective CPD for schools in challenging circumstances

7.1 Recruiting and engaging schools

Lessons to be learnt from this project around school engagement and recruitment include ensuring recruitment starts early (i.e. before schools have already planned in their autumn activities) and allowing sufficient time to identify priority schools. Having a dedicated person or persons to locate schools or networks of schools in priority areas for a targeted approach worked well in the CTfA project and could be replicated elsewhere. Ensuring some degree of flexibility in delivery (i.e. through delivery being taught on full days or twilights, and differing lengths of time between sessions, as well as a certain degree of tailoring content to school phase where possible) can be seen as a facilitator for recruitment of schools in challenging circumstances, as it helps to enable participation for schools where there may be competing pressures on time. Word of mouth and professional networks were also helpful approaches aiding successful recruitment.

7.2 Characteristics of effective CPD

Coe (2020) drew together a list of practical implications for the design of CPD. Although his review focussed on subject-specific CPD, it was based on the broad congruence of evidence found in reviews about the characteristics of effective CPD both within a subject-specific and wider context. These characteristics support changes in teachers' classroom practice, which, in turn, are likely to lead to substantive gains in student learning. These are set out in Appendix E. The first purpose of this section is to highlight key features of the CTfA project, which appeared to lead to positive outcomes indicative of effective CPD that align with Coe's list. The second is to identify any key features of the CTfA project that appeared to lead to positive outcomes indicative of effective CPD, which are not included in Coe's list.

The key features of the CTfA project which align with Coe (2020) and appeared to lead to positive outcomes indicative of effective CPD, were the predominantly evidence-based content and opportunities for participants to trial practical techniques. The content was focussed on improving teachers' skills through their subject-specific pedagogy (Cordingley *et al.*, 2015; Allen & Simms, 2017; Cordingley *et al.*, 2018), with a focus on both theory related to critical thinking, and practical activities to use in class. The content was also strongly focussed on adaptation of activities to suit the needs of learners across school phase, subject area and pupils' ability and needs. 'Opportunities for participants', came from them being presented with new ideas, knowledge and practices, predominantly during the 'plan' phase; with a strong emphasis on reflection and

discussion of practice with peers, particularly during the 'review' phase; and an opportunity to trial and revise teaching techniques in the 'do' phase.

There were a small number of key features of the CTfA project that appeared important to achieving positive outcomes in schools in challenging circumstances, but are not as strongly emphasised in Coe's list or the current evidence base on effective CPD. These were related to the knowledge and expertise of the deliverers and the flexible approach to delivery. GA emphasised a consistency of expertise across their expert deliverers, despite the ability to tailor content to the audience. There is evidence that this could be replicable at scale due to the success of the 'train the trainer' delivery and the focus of the content. Offering flexibility in delivery enabled schools to take part in training in the way that worked best for the staff; for example, the option for whole-school training through schools acting as host schools eliminated travel costs for staff attendance. Schools could also vary the format of delivery (two days or twilight sessions) and the time in between sessions. This flexibility may be particularly helpful for those schools in challenging circumstances where cover for teachers may be an issue. Replicating these features of the CTfA project more widely may support more effective CPD for schools in challenging circumstances.

7.3 Summary

The CTfA project offered theoretical and practical insights into teaching critical thinking for teachers of geography and science across both primary and secondary schools. The 'plan, do, review format' of the project offered participants a mix of new learning, trialling of approaches and reviewing and discussion of early implementation, which enabled tweaking and tailoring for future implementation. The 'do' stage provided participants with the impetus to implement learning from the plan stage within their school, knowing that feedback from this would be shared at the 'review' stage. The project utilised expert deliverers to ensure consistency of quality in the delivery of the project to teachers across the board. Teachers were encouraged to share their learning and to tailor the activities in contextually appropriate ways, enabling a contribution to positive outcomes for teachers, schools, and pupils in challenging circumstances. Teachers were overwhelmingly positive in their commentary about the project, reporting high levels of satisfaction.

The evidence of achievement of the project-specific outcomes was clear for teacher and pupil enthusiasm and engagement through use of the critical thinking techniques across schools and classes, and the approach appeared to promote more independent learning in pupils. However, there was not sufficient evidence of the achievement of all the intended project-specific outcomes. In some instances, this was due to the limitations of the evaluation, in particular interview time constraints meaning that data could not be collected on all outcomes, and evaluation participants feeling unable to comment on the outcomes or perceiving them as not relevant to the training they had received. There

were a few outcomes, including improved subject knowledge and evidence-informed practice where participants reported no or limited impact. Since the delivery and implementation were mostly adhered to as intended, it suggests the causal assumptions that link the project inputs to these outcomes should be reconsidered.

Evidence for the impacts of improved teacher retention can be observed from analysis of the SWC data, specifically for primary school teachers. However, there was no evidence for improved progression from either qualitative data or secondary analysis of the SWC. Evidence for Improved pupil progress and attainment is limited to qualitative findings, whilst there are some indications of the achievement of pupil outcomes, due to partial school closures as a result of the Covid-19 pandemic, and the cancellation of Key Stage 2 assessments and GCSE examinations for the 2020 cohort impact analysis on pupil outcomes could not be undertaken.

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Appendix A CTfA Theory of Change

Rationale and Evidence: EBacc attainment is important to the prospects of disadvantaged pupils' (Long & Bolton, 2017) as young people with a low EBacc pass rate will rarely progress into high quality Level 3 qualifications. Teaching quality is one of the most effective ways of improving the attainment of disadvantaged pupils (Morse, 2017; EEF, 2018), and subject-specific CPD raises the quality of teaching with most effect (Cordingley *et al.*, 2015; Allen & Simms, 2017; Cordingley *et al.*, 2018). Structured subject-specific CPD and quality-assured resources and plans through the GA project support the development of teachers' subject knowledge and pedagogical content knowledge (PCK). This increased knowledge, together with engagement in a supported classroom project, and collaborative working with other teachers and schools leads to increased confidence and enthusiasm for the subject, as well as further enhancing subject knowledge and PCK. Overall, this leads to teachers developing greater capability in subject pedagogy.

Project activities

Inputs

Infrastructure

- CPD leads and mentor training
- Foster school buy-in
- Website
- Networks

Training and support for teachers

- CPD sessions/ resources
- Classroom activity
- Support; peers, mentor, school co-ordinator and online
- Networking
- Optional additional training/support

Outputs

Recruitment:

- 60 teachers recruited as CPD leads
- 1000 teachers
- 300 schools

Delivery:

- 3 stage CPD plan-do-re-view for teachers

Geographical spread measure: 100% of schools are recruited from priority areas

Retention measure: Recruit the best candidates and engage them throughout so that 95% of schools complete the project

Satisfaction measure: 80% of participants rate the project as good or above overall (end of project internal survey)

Softer outcomes

Teachers & subject specific leads:

- Subject knowledge and PCK, particularly use of evidence and critical thinking
- Confidence in subject-specific pedagogy
- Improved satisfaction and motivation to remain in the profession
- Capacity for subject-specific pedagogy
- Feel valued/ subject valued
- Improved networking and less isolation
- Using evidence to inform practice

Schools:

Improved quality of teaching in geography and science

- Increased EBacc CPD
- Improved quality and effectiveness of EBacc teaching in schools facing challenges
- Increased school capacity for delivering knowledge-enriching pedagogy and for planning appropriate curriculum challenge.
- Experience gained in supporting network activity at school level
- Perceptions of improved recruitment of science and geography teachers

Pupils:

- Increased engagement with complex issues
- Enhanced engagement with social and natural science investigation
- Increased up take of geography and science to GCSE and A level

Impacts: Schools

- Improved teacher retention and progression
- Improved pupil progress and attainment

Contextual issues

Teacher: orientation towards project; School: SL support, culture and pupil orientation; Local area context; Policy – curriculum, assessment and accountability measures; Provider: mitigating measures; organisational capacity and capability.

Appendix B SWC matching and comparison group construction

Data sources

The main data source used for the retention and progression analysis was the School Workforce Census (SWC). The SWC has been collected annually on the first Thursday of November since 2010 and it observes teaching staff and their characteristics from all state-sector schools in England. The key teacher characteristics recorded in the SWC and used for the analysis comprised gender, age, qualification date and role, while key school characteristics comprised school phase, type and region.

Each teacher in the SWC is assigned a unique identifier, which enables analysis of the same individual over multiple censuses. This allows observation of key pieces of information about teachers' careers, such as whether they leave state-sector teaching, move school/ area, or progress into a more senior role.

The SWC records the school in which each teacher is employed, meaning it is also possible to identify teachers who move to different schools, LAs and regions.[12] However, since the SWC does not include teachers in private sector schools or schools outside of England, any teachers who move to one of those schools will appear to have left teaching, even though, in reality, they may not have.

The data quality and response rates to the SWC are very high, so the data has good coverage and few gaps. However, it has some gaps due to schools not submitting returns or individual teachers missing from submitted returns, so to minimise the influence of errors and data gaps, and improve the reliability of the retention outcomes, records were imputed where gaps or errors were evident.[13] While this is unlikely to have completely eliminated all instances of SWC data gaps it is unlikely to affect the interpretation of the findings as they are very likely to affect treatment teachers/ schools in a similar way to comparison teachers/ schools.

In addition to the teacher-level variables, school-level data was used for the analysis including region, phase, Ofsted rating and Achieving Excellence Area (AEA) category, all data which is published by the DfE.[14]

The final data source consisted of the management information (MI) data collected by the TLIF providers on the teachers participating in each project, and collated by DfE. The MI data observes teachers' personal details, participation in TLIF projects, along with the provider, the name of the

[12] Teachers may have had contracts in multiple schools, but the file that we used for this evaluation contained one record per teacher per year of the 'main school' that the teacher was working in. The school changes that we observed were therefore changes in the 'main school', as recorded in the SWC.

[13] Cases where data gaps were obvious included the observations in which a teacher was not recorded in a school in a year after which the SWC recorded them as having started in a particular role. For example, if the SWC showed a particular teacher was working in a school in the 2017 census year and they were recorded as having started in their current role in the 2016 census year, where they had no SWC record, then the missing record for 2016 was imputed. In these cases, it was assumed they were teaching in the same school as in 2017, and their time-variant characteristics were imputed as appropriate (reducing their observed age, experience, etc. by one year). School-level characteristics and teacher-level characteristics that do not vary by time (i.e. gender, ethnicity), were set to their observed value in 2017. This imputation affected relatively few records and did not apply to any records in which role start date was not observed.

[14] The latest data is available here: https://www.get-information-schools.service.gov.uk/

school in which the teacher participated in the training and, for some projects, the training start and end dates.

Each teacher in the MI data was linked to their SWC records using their name, TRN and birth date. Across all TLIF projects, 97 per cent of teachers in the MI data were matched to at least one record in the SWC. Match rates varied somewhat across the different projects, although were generally very good, even after accounting for teachers in the MI data who linked to multiple teachers in the SWC, or did not link to an SWC record in the year in which they were recruited to the project.[15]

Table **21** shows that the match rate for teachers listed in the MI data as participating in the CTfAproject was 94 per cent to an SWC record in the year in which, according to the MI data, they were recruited to the project.

Table 21: Matching MI data to the SWC

Stage of matching	Frequency of teachers
Total CTfA participants identified in the MI data	1055
Total CTfA participants matched to at least one SWC record	1040
Total CTfA participants matched to an SWC record in the year they were recruited to the project	990
Match rate (%)	94

Table **22** shows that the match rate for schools in the MI data as participating in the CTfA project was 88 per cent.

Table 22: **Matching schools to the SWC**

Stage of matching	Frequency of schools
Total CTfA schools identified in the MI data	384
Total CTfA schools matched to at least one SWC record	338
Match rate (%)	88

Methodology

Each of the methodological steps in the analysis were performed separately for evaluating the project effects at the individual teacher and the whole school level. After linking the MI data to the

[15] Cases such as these where the match was clearly wrong were removed from the analysis.

SWC, the group of comparison schools/teachers was derived whose retention and progression outcomes were compared to CTfA-participating schools/teachers.

For each treatment and comparison teacher/school, a baseline year was defined, relative to which subsequent retention and progression outcomes were observed. For CTfA participant teachers, this was defined as the year in which the teacher was recruited to the project. For any teachers with multiple observed recruitment dates, the first observed date was used as baseline. For schools, the baseline year was defined as the most common recruitment year for participant teachers in that schools. For example, if the majority of teachers in a particular school were recruited to the project in 2017, then 2017 was assigned as the baseline year for that school.

With this full set of potential comparator teachers/schools, a statistical technique called *propensity score matching* was used to ensure that the treatment and comparison groups were highly comparable in observable characteristics. This was done similarly but separately for teachers and schools. For teachers, the probability (propensity score) that a particular teacher with given characteristics was part of the treatment group was estimated. CTfA participant teachers were then matched with up to ten of their 'nearest neighbours' – comparison teachers with the most-similar likelihood of being in the treatment group, and therefore with the most similar observed characteristics. For schools, the propensity score was estimated with the observed characteristics of the school, rather than individual teachers.

When propensity score matching is able to match on all of the variables that influence selection into the treatment group, then the only remaining difference between the treatment and matched comparison group is the effect participating in the project had. However, variables can only be included in the matching if they are observed in the data. If other unobserved variables influence selection into the treatment group, and also affect retention, then this may partially explain some of the differences in outcomes between the two groups. The potential for this 'selection bias' means caution should be exercised about interpreting the differences between the groups as only representing the causal impact of the project.

The characteristics we used for matching differed between the teacher- and school-level analyses. At the teacher level, both teacher and school characteristics (observed at the baseline year) were used as variables in the matching. The teacher characteristics included age, gender, years since qualification,[16] full-time/part-time status, post and baseline year. The school characteristics used for matching included Ofsted rating, AEA category, quintile of free school meal (FSM) eligibility, quintile of attainment[17], region, phase, and indicator of whether or not the school was participating in any other TLIF projects.

[16] We used years since qualification as a stand-in for experience as the variable observing year of entry into the profession (which was used to calculate years of experience) had a substantial amount of missing observations.
[17] Attainment was measured as the proportion of pupils in the school that met the minimum requirements in Reading, Maths and Science at Key Stage 2 (for primary schools) or GCSEs (for secondary schools). Schools were assigned to an attainment quintile based on this proportion.

At the school level, the following school characteristics (observed at the baseline year) were used as variables in the matching: school phase, Ofsted rating, AEA category, quintile of free school meal (FSM) eligibility, quintile of attainment[18], pre-baseline year retention rates and an indicator of whether the school was participating in any other TLIF projects.

The quality of the match was assessed by examining cross-tabulations of the matching variables across the treatment and comparison groups. Where the variables were balanced – meaning the distribution of characteristics was similar between the treatment and comparison groups – the propensity score matching can be said to have performed well (see Tables **18** and **19** for the matching output).

As all of the outcome variables are dichotomous (i.e. yes or no), the differences in retention and progression outcomes between the two groups were estimated using logistic regression modelling. Retention and progression are considered separately from four different perspectives:

1. Within the same school one and two years after baseline

2. Within the same LA one and two years after baseline

3. Within the profession as a whole one and two years after baseline

4. Within a 'challenging' school one and two years after baseline.

A teacher was considered to have been 'retained' in the same school/LA if they were teaching in a particular school/LA in a given year, and were then recorded as teaching in the same school/LA (based on URN and LA codes) one and two years later. Similarly, a teacher was considered to have been 'retained' in the profession if they were recorded as teaching in a state-sector school in England in a given year, and then were also teaching in a state-sector school in England one or two years later.[19]

'Challenging schools' were generally defined as schools that were rated by Ofsted as 'requires improvement' or 'inadequate'. However, it was also assumed that all CTfA participant teachers were teaching in a 'challenging school' when they were recruited to the project at baseline, even for the relatively few teachers that were in a 'good' or 'outstanding' school (see observed characteristics in the matched sample - Table **23**). This is because the school had been deemed challenging enough to be targeted by the CTfA project, despite having been rated favourably by Ofsted in its last inspection.

Retention in a challenging school was defined at the teacher-level. That is, a CTfA participant teacher was considered as having been retained in a 'challenging school' if they either stayed in

[18] Attainment was measured as the proportion of pupils in the school that met the minimum requirements in Reading, Maths and Science at Key Stage 2 (for primary schools) or GCSEs (for secondary schools). Schools were assigned to an attainment quintile based on this proportion.
[19] To reiterate, since the SWC only observes teachers in state-sector schools in England, any teacher who moves to a private school or to a school outside of England is considered to have left the profession.

the same school they were in at baseline, or had moved to a different school which was rated 'requires improvement' or 'inadequate' in the year they moved. It should be noted that this same definition also applies to comparison teachers (including those in 'good' or 'outstanding' schools not targeted by the CTfA project), but the results of the statistical matching (see Table **20**) ensure that the observed characteristics of the 'good' and 'outstanding' schools in the comparison group are similar to the observed characteristics of the 'good' and 'outstanding' schools within the treatment group.

As a concrete example, a CTfA teacher in a 'good' school who stayed in the same school, or a non-CTfA teacher in a 'requires improvement' school who moved to an 'inadequate' school would both be considered to have been 'retained in a challenging school'. Similarly, any teachers who moved to another school with a 'good' or 'outstanding' rating were considered to have moved to a 'non-challenging' school, regardless of the rating of the school they were in at baseline.

Progression was defined according to three broad role categories – classroom teachers, middle leaders, and senior leaders. Middle leaders were defined as teachers in a "Leading Practitioner", "Excellent Teacher", "Advanced Skills Teacher", or "Advisory Teacher" post, or who received a Teacher Leadership Responsibility (TLR) payment of £100 or more in a given year.[20] Senior leaders were defined by those in an "Executive Head Teacher", "Head Teacher", "Deputy Head Teacher" or "Assistant Head Teacher" role in a given year.

A teacher was considered to have 'progressed' if they moved from a classroom teacher role to either a middle or senior leadership role, or a middle leadership role to a senior leadership role one, two or three years after baseline. Progression within a school/LA/challenging school is defined as those teachers who remain within the same school/LA/a challenging school and progressed from classroom teacher to middle leadership or middle leadership to senior leadership.

Eight different regression models were estimated, one each for retention and progression within the same school/the same LA/challenging schools/the profession. This was done using separate regression models for the teacher-level and the school-level analysis.

For the teacher-level analysis, a logistic regression model was used to estimate the likelihood of retention/progression in each of the eight models. As independent variables, all of the variables from the propensity score matching were included – in order to control for any remaining imbalances in the matching variables between the treatment and comparison groups after matching – as well as the treatment indicator and year dummy variables to account for specific time period effects (e.g. the impact of Covid-19 on the 2020 data). Senior leaders were excluded from the sample estimating the effect on progression as, based on the definition above, they are not able to progress any further and therefore progression outcomes are 'did not progress further' by definition.

[20] This is a definition of middle leader that has been used by DfE in the past. See Footnote 14 in https://www.gov.uk/government/statistics/teachers-analysis-compendium-2017

To compare the differences between the two groups, the probability of 'retention' or 'progression' was estimated if every teacher had been involved in the project, and then again if every teacher had not been involved in the project. The average of these predicted probabilities is the average estimated retention/progression rate for treatment and comparison teachers, respectively. The difference between treatment and comparison teachers is the estimated 'marginal effect', which is presented in the tables in section **4**, with the accompanying odds ratio estimates in Appendix **C**. Standard errors for the marginal effect estimates are calculated using the delta method and statistical significance is assessed at the five per cent level.

For the school-level analysis, the models were estimated using teacher-level data in a logistic mixed-effects regression model. As independent variables, all of the variables from the propensity score matching, as well as the treatment indicator, census year and an interaction between these variables were included. School was included as a random effect.

To compare the differences between the two groups, the model estimated the probability that each teacher in the matched sample would have been 'retained' or 'progressed' if they had been involved in the project, and then again if they had not been involved in the project, in each of the five census years. The average of these predicted probabilities was then taken to find the estimated retention/progression rate, with and without the treatment. The difference between these estimated retention/progression rates is the estimated 'marginal effect', which is presented in the tables in section **4**. The difference-in-difference testing was then performed to compare the difference between treatment and comparison, between pre-baseline and each post-baseline year. For each post-baseline year, the treatment vs. comparison difference was compared to an average of the pre-baseline differences. The same difference-in-difference estimates are also presented as odds ratios in Appendix **C.** Statistical significance is assessed at the five per cent level.

Statistical Matching

Table **23** below highlights the sample characteristics for the full treatment and comparison groups for the teacher-level analysis. In the unmatched samples, treatment teachers were more likely to be younger, and less experienced than in the unmatched potential comparison group. Similarly, the schools that treatment teachers were in were more likely to be rated 'requires improvement' or 'inadequate', have lower attainment, higher proportions of pupils eligible for free school meals, and be an AEA category 5 or 6 school at baseline.

After matching, the proportions of comparison teachers in each of the key matching characteristics were much more closely aligned with treatment teachers. While some small differences between treatment and comparison teachers still existed after matching, including the matching variables as covariates in the logistic regression modelling ensured that the final estimates controlled for any of these outstanding differences.

Focussing on the subset of potential comparison teachers who were the most similar to treatment teachers necessarily involved discarding some potential comparison teachers from the matched

sample, when there were no sufficiently similar treatment teachers with which to match. Of the 619,205 potential comparison teachers, only 7,861 were matched to a treatment teacher, highlighting how potential comparison teachers were still fairly dissimilar to teachers recruited to the CTfAproject (at least in observed teacher and school characteristics).

Six treatment teachers were also discarded from the matched sample, as these teachers have no sufficiently similar counterpart in the potential comparison teacher sample.

Table 23: Characteristics of treatment and comparison teachers before and after matching in the full sample

Characteristic	Treatment teachers (%)	Potential comparison teachers (%)	Matched treatment teachers (%)	Matched comparison teachers (%)
Male	20.7	18.5	20.4	19.7
Female	79.3	81.5	79.6	80.3
Aged under 30	30.4	23.1	30.4	31.0
Aged 30-49	57.3	58.9	57.3	56.3
Aged 50 or older	12.3	18.0	12.3	12.7
Within 5 years of qualifying	35.9	24.0	35.7	35.8
Between 5 and 9 years since qualifying	18.5	20.1	18.6	17.8
Between 10 and 19 since qualifying	26.9	29.6	26.8	27.0
20 years or more since qualifying	<17.0	22.2	<17.0	18.7
Years since qualifying unknown	<2.0	4.0	<2.0	0.7
Classroom teacher	79.0	78.1	79.1	80.1
Middle leader	8.7	6.1	8.5	7.5
Senior Leader	12.3	15.9	12.4	12.4
Full-time	82.1	74.4	82.0	81.7
Part-time	17.9	25.6	18.0	18.3
AEA category 1	1.2	17.7	1.2	0.6
AEA category 2	4.0	14.3	4.1	3.2
AEA category 3	3.1	16.7	3.2	2.1
AEA category 4	6.6	19.5	6.6	6.3
AEA category 5	45.8	16.2	45.6	44.9

Characteristic	Treatment teachers (%)	Potential comparison teachers (%)	Matched treatment teachers (%)	Matched comparison teachers (%)
AEA category 6	39.3	15.7	39.3	42.9
Ofsted Outstanding	9.1	20.7	9.1	8.7
Ofsted Good	48.5	65.2	48.8	52.3
Ofsted Requires Improvement	28.9	8.7	29.0	26.3
Ofsted Inadequate	7.0	2.6	6.6	6.6
Ofsted unknown	6.6	2.9	6.5	6.2
Nursery or Primary school	76.3	79.8	76.6	78.9
Secondary or Special school	23.7	20.2	23.4	21.1
FSM highest 20%	33.1	19.1	33.2	34.0
FSM middle-highest 20%	30.6	18.9	30.4	28.7
FSM middle 20%	15.1	18.6	15.0	15.8
FSM middle-lowest 20%	11.5	17.7	11.6	12.5
FSM lowest 20%	7.4	16.5	7.4	7.3
FSM unknown	2.3	9.2	2.3	1.6
Attainment highest 20%	7.4	16.2	7.4	6.4
Attainment middle-highest 20%	18.2	19.6	18.1	17.9
Attainment middle 20%	18.0	17.3	18.1	20.4
Attainment middle-lowest 20%	34.2	18.1	34.0	35.4
Attainment lowest 20%	16.6	16.6	16.7	14.7
Attainment unknown	5.7	12.2	5.7	5.2
East of England	8.8	11.3	8.8	9.5
East Midlands	21.3	8.2	21.2	21.5
West Midlands	9.7	10.7	9.8	12.3
North East	4.9	4.7	5.0	5.0
North West	18.9	13.4	18.9	16.4
London / South East	8.8	32.6	8.7	6.8
South West	3.4	9.6	3.5	3.0
Yorkshire and the Humber	24.1	9.5	24.1	25.5

Characteristic	Treatment teachers (%)	Potential comparison teachers (%)	Matched treatment teachers (%)	Matched comparison teachers (%)
Proportion of teachers in schools not participating in other whole-school projects	85.7	99.1	86.1	89.2
Proportion of teachers in schools participating in other whole-school projects	14.3	0.9	13.9	10.8
Baseline year 2018	92.5	49.9	92.5	93.5
Baseline year 2019	7.5	50.1	7.5	6.5
Number of teachers	**990**	**619205**	**984**	**7861**

In addition to the full matched sample, a second matched sample was derived, with which to estimate the differences in career progression and retention within the same school/same LA/a challenging school. This sample was only used for the teacher level analysis and not the school level analysis. Given that career progression or retention within the same school/same LA/a challenging school for teachers who left the profession is not observed for teachers who leave the profession, this additional matched sample consisted of a subset of teachers in the full sample who did not leave the profession in the three years after baseline. This sample of non-leavers comprised 892 of the 990 treatment teachers (90 per cent) and 544,200 of the 619,205 (88 per cent) comparison teachers in the full sample.

Like in the full sample, CTfA participant teachers in the non-leaver sample were more likely than comparison teachers to be younger, less experienced and in ‘requires improvement’ or ‘inadequate’ schools with lower attainment and higher proportions of pupils eligible for free school meals. Balance was improved by the matching, such that matched comparison teachers were similar to treatment teachers.

The matching process matched 878 of the 892 treatment teachers and 7094 of the 544,200 potential comparison teachers to similar counterparts in the other group.

Table **24** below highlights the school sample characteristics for the full treatment and comparison groups used in the school-level analysis. Most characteristics, like AEA category, attainment quintile, were not closely aligned before matching, with treatment schools more likely to be an AEA category 5 or 6 school, be lower-attaining, and have a higher proportion of pupils eligible for free school meals than schools in the comparison group.

Table 24:Characteristics of potential comparator schools, schools in the intervention group and matched comparison schools

Characteristic	Potential comparator schools (%)	Project schools (%)	Matched comparison schools (%)
Nursery	2	0	0
Primary	77	60	73
Secondary	15	35	26
16 Plus	0	0	0
Special	6	0	1
East of England	12	10	10
East Midlands	9	25	23
West Midlands	11	10	12
Inner London	5	0	0
Outer London	7	0	0
North East	5	10	8
North West	15	15	16
South East	15	5	7
South West	11	0	1
Yorkshire and the Humber	10	20	22
AEA category 1	15	0	1
AEA category 2	15	5	2
AEA category 3	17	5	3
AEA category 4	19	10	7
AEA category 5	17	40	43
AEA category 6	17	40	45
FSM lowest 20%	19	10	10
FSM middle-lowest 20%	18	10	13
FSM middle 20%	18	20	21
FSM middle-highest 20%	18	25	25
FSM highest 20%	18	30	28

Characteristic	Potential comparator schools (%)	Project schools (%)	Matched comparison schools (%)
Unknown FSM	8	0	2
Attainment lowest 20%	16	15	18
Attainment middle-lowest 20%	19	25	25
Attainment middle 20%	17	25	20
Attainment middle-highest 20%	19	15	18
Attainment highest 20%	16	10	9
Unknown Attainment	14	10	10
Ofsted Inadequate	3	5	7
Ofsted Requires improvement	10	25	24
Ofsted Good	65	55	56
Ofsted Outstanding	20	10	10
Ofsted Unknown	2	5	3
Mean teacher retention rate in 2015	91	90	89
Mean teacher retention rate in 2016	91	91	90
Mean teacher retention rate in 2017	92	91	91
Number of schools	**21515**	**338**	**2341**
Number of teachers	**499552**	**5461**	**32776**

Note: Matching was performed at a school level, so these percentages are also at a school level e.g. 10 per cent of schools not 10 per cent of teachers. Comparison school percentages are rounded to the nearest 1 per cent. Treatment school percentages are rounded to the nearest 5 per cent. The rounding is to ensure data are not disclosive.

After matching, the proportions of comparison schools in each of the key matching characteristics were much more closely aligned with treatment schools. The propensity score matching has ensured that schools in the matched comparison group are drawn primarily from AEA category 5 and 6 schools rated good or requires improvement, with relatively high proportion of pupils eligible for free school meals and relatively low attainment. While some small differences between

treatment and comparison teachers still existed after matching, including the matching variables in the logistic regression modelling ensured that our final estimates controlled for any of these outstanding differences.

Appendix C Outcomes of SWC impact analysis

Table 25: Odds ratios from the retention and progression outcome analysis

	1 year after baseline	2 years after baseline
Retention in state-sector teaching	2.3 (1.7 – 3.1)	2.2 (1.7 – 2.9)
Retention in the same school	3.4 (2.3 – 5.4)	2.2 (1.7 – 3.0)
Retention in the same LA	2.4 (1.5 – 4.2)	1.8 (1.3 – 2.5)
Retention in a challenging school	4.1 (2.5 – 7.7)	2.5 (1.8 – 3.8)
Progression in state-sector teaching	0.8 (0.5 – 1.2)	1.2 (0.9 – 1.7)
Progression in the same school	0.9 (0.5 – 1.5)	1.3 (0.9 – 1.9)
Progression in the same LA	0.9 (0.5 – 1.4)	1.3 (0.9 – 1.8)
Progression in a challenging school	0.9 (0.5 – 1.4)	1.3 (0.9 – 1.9)

Note: Figures in brackets represent the 95 per cent confidence interval of the odds ratio estimate.

Table 26: Odds ratios from the retention and progression school level outcome analysis

	1 year after baseline	2 years after baseline
Retention in state-funded teaching	1.0 (0.9 – 1.1)	0.9 (0.8 – 1.0)
Retention in the same school	1.1 (1.0 – 1.3)	1.1 (0.9 – 1.2)
Retention in the same LA	1.1 (0.9 – 1.3)	1.0 (0.9 – 1.3)
Retention in challenging schools	1.2 (1.0 – 1.4)	1.1 (0.9 – 1.3)
Progression in state-funded teaching	0.9 (0.7 – 1.1)	1.1 (0.9 – 1.3)
Progression in the same school	0.9 (0.7 – 1.1)	1.0 (0.8 – 1.3)
Progression in the same LA	0.9 (0.7 – 1.1)	1.1 (0.9 – 1.4)
Progression in challenging schools	0.9 (0.7 – 1.1)	1.0 (0.8 – 1.3)

Note: Figures in brackets represent the 95 per cent confidence interval of the odds ratio estimate.

Appendix D Sample characteristics for qualitative data collection

Table 27: Number and percentage of interviewees and case studies by priority status

Priority types	Number of interviews N	Number of interviews %	Number of case studies N	Number of case studies %
Ofsted 3/4 and AEA 5/6	11	36.66	2	100
Ofsted 1/2 but AEA 5/6	13	43.33	0	0
Ofsted 3/4 AEA 1-4	1	3.33	0	0
Ofsted 1/2 no info on AEA category	4	13.33	0	0
AEA 5/6 no info on Ofsted	1	3.33	0	0
Total	30	100	2	100

Table 28: Number and percentage of interviewees and case studies combined by priority status

Priority types	Number of interviews & case studies N	Number of interviews & case studies %
Ofsted 3/4 and AEA 5/6	13	40.62
Ofsted 1/2 but AEA 5/6	13	40.62
Ofsted 3/4 AEA 1-4	1	3.12
Ofsted 1/2 no info on AEA category	4	12.50
AEA 5/6 no info on Ofsted	1	3.12
Total	32	100

Table 29: Breakdown of priority schools

Including Case studies	N	%
AEA 5/6	26	81.25
Ofsted 3/4 AEA 5/6	13	40.62

Table 30: Format of CPD undertaken by 30 interview participants

Participant type	Full days – Primary	Full days – Secondary	Half days – Primary	Half days – Secondary	Mixture of delivery modes – Primary	Mixture of delivery modes – Secondary
Science lead	4	1	3	-	-	-
Science teacher	1	1	-	-	-	-
Geography lead	4	4	-	1	-	-
Geography teacher	1	2	-	2	-	-
History lead	-	-	1	-	-	-
All subjects leader	-	-	-	-	-	-
All subject teacher	1	-	-	1	-	-
Head/ deputy head	2	-	-	-	1	-

* Participants have been classed as either 2 full days or 3 half days based on what they enrolled for. We have not detailed in this table whether participants attended all of their course. **All through and middle schools have been classed as secondary ***first schools are classed as primary

Appendix E Practical summary of the evidence about effective CPD (Coe, 2020)

CPD that aims to support the kinds of changes in teachers' classroom practice that are likely to lead to substantive gains in student learning should:

1) Focus on promoting the teacher skills, knowledge and behaviours that are best evidenced as determining student learning. Such content should be appropriately sequenced and differentiated to match the needs of participants.

2) Have sufficient duration (two terms) and frequency (fortnightly) to enable changes to be embedded.

3) Give participants opportunities to:

    a) be presented with new ideas, knowledge, research evidence and practices

    b) reflect on and discuss that input in ways that surface and challenge their existing beliefs, theories, and practices

    c) see examples of new practices/materials/ideas modelled by experts

    d) experiment with guided changes in their practice that are consistent with these challenging new ideas and their own context

    e) receive feedback and coaching from experts in those practices, on an ongoing basis

    f) evaluate, review, and regulate their own learning

4) Create/require an environment where:

    a) participants can collaborate with their peers to support, challenge, and explore

    b) school leadership promotes a culture of trust and continuous professional learning

    c) teachers believe they can and need to be better than they are

    d) the process and aims of the project are aligned with the wider context (e.g. accountability)

Based on Cordingley et al (2015; 2018); Timperley et al (2007); Darling-Hammond et al (2017); Kennedy (2016) and Kraft et al. (2018).

Source: Coe, R., (2020) The Case for Subject-Specific CPD. Report for the Institute of Physics January 2020

Appendix F: Analysis of Management Information for the Teaching and Leadership Innovation Fund: Geographical Association

Introduction

The Teaching and Leadership Innovation Fund (TLIF) was a DfE fund through which 10 providers offered support to schools in a variety of areas from behaviour management to phonics and STEM teaching. The aim of the fund was to create and develop a sustainable market for high-quality Continuous Professional Development (CPD). This is a summary of Management Information (MI) data submitted by all ten providers receiving TLIF funding and **does not** assess project impact. The data was submitted in February 2020 and covers the schools and participants recruited, as indicated by the providers. Comparable national figures in this report are based on the 2018 School Workforce Census covering teaching staff in state-funded schools, and Ofsted as at the most recent inspection. The 2018 School Workforce Census was chosen in order to align with the most schools across programme cohorts between 2017 and 2020. The school level analysis refers to all schools that were recruited by providers to participate in the project, including those that withdrew. Schools may have been recruited by more than one provider and participants may have been registered for more than one project.

Targets: Background

Each provider had a number of Key Performance Indicators (KPIs). These were broken down into three different categories:

- **geography**: whether specific areas were targeted by providers (e.g. regional targets, Opportunity Areas, priority areas) and whether particular schools should be targeted by providers (e.g. based on Ofsted rating)
- **schools**: the target number of schools
- **participants**: the target number of participants

All providers had a geography target and either a participant or a school target, but not necessarily both.

In the context of the TLIF evaluation, a priority area is defined as Achieving Excellence Areas (AEAs) 5 or 6 (Opportunity Areas fall within this category), and a priority school is defined as a school with an Ofsted rating of Requires improvement (Ofsted grade 3) or Inadequate (Ofsted grade 4).

Note: there are some discrepancies between the overall numbers from providers and those in the data set sent to us. The provider numbers cannot be broken down in school/area type etc. so analysis will not be conducted on this data, however headline figures will be presented where available.

Targets: Breakdown

Geographical Association (GA) delivered the Bravo Programme, a project for subject specialists in Geography and Science with the aim of advancing subject-specific skills and knowledge of Ebacc subjects. GA had the following KPI targets:

Geography Level:

- A minimum of 70% of schools were to be recruited from priority areas (category 5 and 6 areas).
- Within priority areas, a minimum of 70% of delivery was to be aimed at teachers and leaders in priority schools (Ofsted rated 3 or 4).
- All participants not in priority areas were to be recruited from priority schools.
- The programme did not recruit from specific regions.

School Level:

- A minimum of 300 schools were to be recruited to the programme.
- The programme was aimed at both Primary and Secondary schools.

Participant Level:

- A minimum of 1000 participants were to be recruited during the programme.
- The programme was aimed at: primary and secondary teachers of Geography and Science.

Note: The role/leadership data held isn't detailed enough to reliably assess subject taught, so this analysis has not been conducted.

Total school numbers

A total of 384 schools were recruited by GA. However, removing schools where all participants withdrew reduces this to 380 schools.

The initial target was 300 schools.

Note: GA's own data puts the number of schools at 392, however, not all of these schools are present in DfE's Management Information data set.

84% of schools recruited were from priority areas, exceeding the target of 70%.

Total participant numbers

The total number of teachers that participated in the course was 1050. Removing those that withdrew gives a total of 1039. The target number of participants was 1000.

Note: GA's own data puts the number of participants at 1055, however, not all of these participants are in our participant data set.

Of the participants in Priority Areas, 36% were from priority schools. The target was 70%
Of the participants not in Priority Areas, 93% were from priority schools. The target was 100%

Note: 11 schools had no Ofsted rating data and weren't included in the priority schools analysis.

Schools by Phase

Of all schools recruited by **GA** (including withdrawals):

- 60% were Primary schools,
- 39% were Secondary,
- and less than 1% were Special schools.

Secondary schools were over-represented, accounting for 39% of recruited schools compared to the national figure of 16%.

Schools by Region

GA recruited from schools in all eight RSC Regions. The region with the highest proportion of schools recruited by GA (including withdrawals) was East Midlands and the Humber where 38% of participating schools were based.

Of the remaining schools:

- 23% were based in Lancashire and West Yorkshire,
- 11% in West Midlands,
- 11% in the North of England,
- 6% in South Central and North West London,
- 5% in East of England and North East London,
- 5% in South East and South London,
- 1% in South West.

Schools by AEA Category

AEA categories are DfE classifications of Local Authority Districts (LADs) by educational performance and capacity to improve, introduced in 2016. It splits areas into six categories from "Strong” Category 1 areas to "Weak” Category 6 areas.

Of all the schools recruited by GA (including withdrawals), 84% were in Categories 5 and 6, compared to 34% of schools nationally.

Schools by Index of Multiple Deprivation Decile

The Index of Multiple Deprivation (IMD) is a "neighbourhood" measure of deprivation produced by the Ministry of Housing, Communities and Local Government. Each neighbourhood is placed into a decile with decile 1 containing the most deprived areas and decile 10 containing the least deprived.

GA generally recruited from more deprived areas with 58% of schools recruited (including withdrawals) from deciles 1-4.

Participants by role

Roles were provided in TLIF Management Information as free text and matched to a standardised leadership level. Below these have been compared to national figures taken from the 2018 School Workforce Census Publication.

GA recruited participants from all teaching and leadership levels. Classroom Teachers were over-represented compared to the national picture, making up 75% of participants compared to 57% of teachers nationally. This is in line with GA's target of recruiting teachers of Geography and Science. Of all remaining participants:

- 17% were middle leaders,
- 5% were senior leaders,
- 3% were headteachers,
- 1% were non-teaching staff.

Appendix G SWC subsample primary and secondary school teachers

Primary teachers only

Retention in the state-funded sector in England - Primary School Teachers

Table 31: Difference in the estimated rate of retention in state-funded teaching in England between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated retention rate in state-funded teaching 1 year after baseline (%)	96.4	90.2	6.2	Yes
Number of teachers	**752**	**6329**		
Estimated retention rate in state-funded teaching 2 years after baseline (%)	94.8	85.1	9.8	Yes
Number of teachers	**701**	**5911**		

Note: Estimated retention rates are the average predicted retention rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Table 32 shows that the CTfA project is associated with a statistically significant higher rate of retention within the state-funded teaching profession for Primary teachers; with treatment teachers between 6.2 and 9.8 percentage points more likely to be retained in teaching one and two years after the baseline data was collected. This suggests that the CTfA project had a positive impact on teacher retention in the profession.

Retention in the school

Table 32: Difference in the estimated rate of retention in the same school between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated retention rate in the same school 1 year after baseline (%)	98.9	92.4	6.5	Yes
Number of teachers	**689**	**5885**		
Estimated retention rate in the same school 2 years after baseline (%)	95.5	88.5	7.0	Yes
Number of teachers	**646**	**5529**		

Note: Estimated retention rates are the average predicted retention rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Table 33 shows that there was a statistically significant difference in the estimated rate of retention within the same school they were in at baseline between treatment teachers and matched comparison teachers. Specifically, the estimated retention rate within the same school for treatment teachers was 6.5 percentage points higher than for the comparison groups 1 year after baseline, growing to 7.0 percentage points higher after 2 years.

Retention in the same local authority

Table 33: Difference in the estimated rate of retention in the same local authority district (LAD) between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated retention rate in the same LAD 1 year after baseline (%)	99.2	96.1	3.1	Yes
Number of teachers	**689**	**5885**		

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated retention rate in the same LAD 2 years after baseline (%)	96.8	93.9	2.9	Yes
Number of teachers	**646**	**5529**		

Note: Estimated retention rates are the average predicted retention rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Retention in challenging schools

Table 34: Difference in the estimated rate of retention in challenging schools[21] between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated retention rate in challenging schools 1 year after baseline (%)	99.3	94.4	4.9	Yes
Number of teachers	**689**	**5825**		
Estimated retention rate in challenging schools 2 years after baseline (%)	96.7	91.7	5.0	Yes
Number of teachers	**643**	**5441**		

Note: Estimated retention rates are the average predicted retention rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

[21] For the purposes of this analysis, 'challenging' schools were defined as schools rated by Ofsted as 'requires improvement' or 'inadequate'. A teacher was defined as remaining in a challenging school if they either stayed within the school they were in at baseline, or moved to another school which was rated 'requires improvement' or 'inadequate'.

Teacher progression

Progression in the state-funded sector in England

Table 35: Difference in the estimated rate of progression in state-funded teaching in England between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in state-funded teaching 1 year after baseline (%)	0.7	1.9	-1.2	Yes
Number of teachers	**689**	**5885**		
Estimated progression rate in state-funded teaching 2 years after baseline (%)	2.3	2.9	-0.6	No
Number of teachers	**646**	**5529**		

Note: Estimated progression rates are the average predicted progression rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Progression in the school

Table 36: Difference in the estimated rate of progression in the same school between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in the same school 1 year after baseline (%)	0.7	1.4	-0.7	Yes
Number of teachers	**680**	**5441**		
Estimated progression rate in the same school 2 years after baseline (%)	1.8	2.2	-0.5	No
Number of teachers	**616**	**4918**		

Note: Estimated progression rates are the average predicted progression rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level.

Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Progression in the same local authority

Table 37: Difference in the estimated rate of progression in the same local authority district (LAD) between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in the same local authority 1 year after baseline (%)	0.7	1.7	-1.0	Yes
Number of teachers	**683**	**5652**		
Estimated progression rate in the same local authority 2 years after baseline (%)	2.0	2.6	-0.6	No
Number of teachers	**625**	**5201**		

Note: Estimated progression rates are the average predicted progression rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Progression in challenging schools

Table 38: Difference in the estimated rate of progression in challenging schools[22] between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in challenging schools 1 year after baseline (%)	0.7	1.5	-0.8	Yes
Number of teachers	**684**	**5509**		

[22] For the purposes of this analysis, 'challenging' schools were defined as schools rated by Ofsted as 'requires improvement' or 'inadequate'. A teacher was defined as progressing in a challenging school if they moved to a middle/senior leadership position from a classroom teaching position or a senior leadership position from a middle leadership position *and* either stayed in their baseline school or moved to a challenging school.

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in challenging schools 2 years after baseline (%)	1.9	2.4	-0.5	No
Number of teachers	**622**	**5007**		

Note: Estimated progression rates are the average predicted progression rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Secondary teachers only

Retention in the state-funded sector in England

Table 39: Difference in the estimated rate of retention in state-funded teaching in England between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated retention rate in state-funded teaching 1 year after baseline (%)	92.5	90.5	2.0	No
Number of teachers	**232**	**1532**		
Estimated retention rate in state-funded teaching 2 years after baseline (%)	85.4	86.5	-1.1	No
Number of teachers	**209**	**1366**		

Note: Estimated retention rates are the average predicted retention rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Retention in the school

Table 40: Difference in the estimated rate of retention in the same school between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated retention rate in the same school 1 year after baseline (%)	93.1	90.9	2.2	No
Number of teachers	**189**	**1209**		
Estimated retention rate in the same school 2 years after baseline (%)	88.5	84.5	4.0	No
Number of teachers	**168**	**1069**		

Note: Estimated retention rates are the average predicted retention rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Retention in the same local authority

Table 41: Difference in the estimated rate of retention in the same local authority district (LAD) between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated retention rate in the same LAD 1 year after baseline (%)	94.7	93.8	0.8	No
Number of teachers	**189**	**1209**		
Estimated retention rate in the same LAD 2 years after baseline (%)	91.4	88.8	2.6	No
Number of teachers	**168**	**1069**		

Note: Estimated retention rates are the average predicted retention rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Retention in challenging schools

Table 42: Difference in the estimated rate of retention in challenging schools[23] between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated retention rate in challenging schools 1 year after baseline (%)	95.9	94.6	1.3	No
Number of teachers	**186**	**1191**		
Estimated retention rate in challenging schools 2 years after baseline (%)	95.0	90.3	4.7	Yes
Number of teachers	**163**	**1040**		

Note: Estimated retention rates are the average predicted retention rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted retention rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Teacher Progression

Progression in the state-funded sector in England

Table 43: Difference in the estimated rate of progression in state-funded teaching in England between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in state-funded teaching 1 year after baseline (%)	8.1	6.7	1.4	No
Number of teachers	**189**	**1209**		
Estimated progression rate in state-funded teaching 2 years after baseline (%)	18.9	12.6	6.3	Yes

[23] For the purposes of this analysis, 'challenging' schools were defined as schools rated by Ofsted as 'requires improvement' or 'inadequate'. A teacher was defined as remaining in a challenging school if they either stayed within the school they were in at baseline, or moved to another school which was rated 'requires improvement' or 'inadequate'.

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Number of teachers	**168**	**1069**		

Note: Estimated progression rates are the average predicted progression rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Progression in the school

Table 44: Difference in the estimated rate of progression in the same school between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in the same school 1 year after baseline (%)	7.9	6.3	1.6	No
Number of teachers	**174**	**1097**		
Estimated progression rate in the same school 2 years after baseline (%)	17.4	11.3	6.1	Yes
Number of teachers	**146**	**908**		

Note: Estimated progression rates are the average predicted progression rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Progression in the same local authority

Table 45: Difference in the estimated rate of progression in the same local authority district (LAD) between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in the same local authority 1 year after baseline (%)	8.3	6.4	1.9	No
Number of teachers	**178**	**1131**		

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in the same local authority 2 years after baseline (%)	17.7	11.7	6.0	Yes
Number of teachers	**153**	**951**		

Note: Estimated progression rates are the average predicted progression rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

Progression in challenging schools

Table 46: Difference in the estimated rate of progression in challenging schools[24] between treatment and comparison teachers

	Treatment teachers	Comparison teachers	Difference	Statistically significant?
Estimated progression rate in challenging schools 1 year after baseline (%)	7.7	6.4	1.3	No
Number of teachers	**178**	**1128**		
Estimated progression rate in challenging schools 2 years after baseline (%)	18.5	11.4	7.2	Yes
Number of teachers	**154**	**944**		

Note: Estimated progression rates are the average predicted progression rates from a logistic regression model for treatment and comparison teachers, controlling for observed characteristics. The difference in average predicted progression rates is the marginal effect. Statistical significance of this difference is assessed at the five per cent level. Due to rounding, some estimated marginal effects may not exactly equal the difference between treatment and comparison teachers.

[24] For the purposes of this analysis, 'challenging' schools were defined as schools rated by Ofsted as 'requires improvement' or 'inadequate'. A teacher was defined as progressing in a challenging school if they moved to a middle/senior leadership position from a classroom teaching position or a senior leadership position from a middle leadership position *and* either stayed in their baseline school or moved to a challenging school.

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