Establishing the impact of Uni Connect at the programme level

Lessons learned from implementing a quasi-experimental approach

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Glossary

A&P	Access and participation
ATT	Average treatment effect on the treated
AWM	Aimhigher West Midlands – tracking organisation
CG	Control group
DiD	Difference in difference (analysis)
EMWPREP	East Midlands Widening Participation Research and Evaluation Partnership – tracking organisation
FSM	Free School Meals
GSCE	General Certificate of Secondary Education
HE	Higher education
HEAT	Higher Education Access Tracker – tracking organisation
HEFCE	Higher Education Funding Council for England
IAG	Information, advice and guidance
IDACI	Income Deprivation Affecting Children Index
ITT	Intention to treat
KS	Key Stage (in the educational journey)
MHCLG	Ministry of Housing, Communities and Local Government
NCOP	National Collaborative Outreach Programme
NPD	National Pupil Database
OfS	Office for Students
ONS	Office for National Statistics
PSM	Propensity score matching
SAT	Standard Assessment Test – national curriculum tests for pupils in Key Stage 2
SRS	Secure Research Service
TG	Treatment group

Summary

Uni Connect was established in 2017 to increase progression to higher education (HE) among young people living in areas where HE participation is lower than might be expected given the GCSE attainment. Although the core purpose of the programme has remained unchanged, the specific aims have evolved in response to HE policy and the strategic priorities of its funder, the Office for Student (OfS). Uni Connect partnerships deliver a range of outreach activities through direct engagement with schools and colleges and via Outreach Hubs. These include mentoring, campus visits, summer schools, skills and attainment workshops and subject masterclasses, as well as information, advice and guidance (IAG) on the benefits and realities of HE. The aim is to help learners make informed decisions about their education and develop the knowledge, skills, and confidence to progress to HE.

Impact evaluation

CFE has been tracking learner outcomes that evidence suggests could be associated with the likelihood of a young person progressing to HE through a longitudinal survey over five years. The aim was to establish the impact of the programme at the national level by measuring changes in these outcomes and the extent to which they could be attributed to Uni Connect. The impact analysis presented in this report is based on survey data collected between the baseline wave of the survey (W0) in 2017-18 and W3 in 2020-21. Impact estimates for two cohorts (Year 9 - W0 to Year 11 - W2 and Year 9 -W0 to Year 12 – W3) were generated using a repeated cross-section difference-in-difference (DiD)[1] analysis. Kernel propensity score matching (PSM)[2] was used to match a control group (CG) to the treatment group (TG) because the longitudinal sample was not large enough to measure change over time for the same cohorts of individuals.

Although the results of the impact analysis are provided, the main focus of this report is the challenges of establishing impact at the programme level. It considers how the design of the programme and factors such as Covid-19, as well as subsequent changes to Uni Connect targeting and delivery, have impacted on the evaluation and the analytical approaches possible at the W3 point. It also explores the methodological issues that have been encountered and the implications of the data limitations for the robustness of the analysis and the conclusions that can be drawn at this stage.

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[1] DidD is a statistical technique used in econometrics and quantitative research in the social sciences. It attempts to mimic an experimental research design using observational study data by studying the differential effect of a programme on a 'treatment group' versus a 'control group' in a natural experiment.

[2] Kernel PSM is a quasi-experimental method which uses statistical techniques to construct an artificial control group by matching the group of treated individuals with a group of non-treated individual with similar characteristics.

Key findings

Two impact estimates[3] for the two cohorts identified significant results[4] for 11 out of the 22 outcomes measured. However, it is not possible to definitively attribute the differences in outcomes between the CG and the TG to Uni Connect and the effects detected are more likely to reflect unobserved differences between the two groups. The results, therefore, present a confusing picture which makes it difficult, if not impossible, to draw any robust conclusions about the impact of Uni Connect at the programme level.

Learning for future evaluations

Although the impact analysis has not been implemented as originally intended, or yielded the results hoped for at the outset, the process has provided some useful insights into the methodological challenges which should be considered, along with practical issues such as time and budget constraints, when planning impact evaluation of outreach activities in the future. The key learning points based on our experience are:

- **Ensure a 'clean treatment':** the criteria for the treatment group should be clearly articulated, strictly implemented and remain unchanged for the duration of the programme. This will ensure only those who are targeted for the intervention receive it and enable the outcomes of those who take part in the programme to be compared with the outcomes of those who do not to establish impact.
- **Identify a suitable comparison group at the outset:** non-target learners as a whole are unlikely to make a suitable comparison group because they are not sufficiently similar to the target group. Target learners who do not take part in the programme are likely to be a better match, however, there may still be unobserved differences between these learners and those who take part. Identifying schools and colleges that meet the criteria for the programme (rather than specific individuals within a school or college) and randomly assigning them to a TG and CG would help to ensure a cleaner treatment and a well-matched comparison group.
- **Consider alternative approaches to establishing impact if a suitable comparison group cannot be created:** a dosage effect can be used to establish the impact of a programme or single intervention on target learners *only* by comparing the outcomes of those who receive a 'low dose' with those who receive a 'high dose'. Access to robust tracking information is essential to support this approach.
- **Maximise the longitudinal sample available for analysis:** to measure

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3 Two models of analysis were run: Intention to treat (ITT) and Average treatment effect on the treated (ATT)

4 At a minimum of $p > 0.05$

change in outcomes over time, data must be collected from both the TG and CG at each sampling point. Mechanisms must be put in place to minimise the risk of attrition between survey waves and to ensure the longitudinal sample achieved is representative of the baseline and the wider population. For national programmes delivered at a local level, it is essential for all delivery partners to participate in data collection to ensure the sample is representative. Ideally baseline survey respondents should be tracked individually so they can be targeted for subsequent waves of the survey.

01. Introduction

Uni Connect was established in 2017 to increase progression to higher education (HE) among target young people from under-represented groups. Since its launch, 29 partnerships have been funded to deliver the programme which has focussed primarily on learners in Years 9 to 13 living in 997 areas[5] where HE participation is lower than might be expected given the GCSE attainment. More recently, the programme has been expanded to support young adults aged 19+ studying at further education colleges in partnerships' areas. Although the core purpose of the programme has remained unchanged, the specific aims have evolved over its first two phases[6] in response to policy and the strategic priorities of its funder, the Office for Student (OfS).[7] In Phase Two, Uni Connect was designed to support the OfS to ensure *"all students, from all backgrounds, with the ability and desire to undertake higher education, are supported to access, succeed in, and progress from higher education"*.[8]

Partnerships deliver a range of outreach activities through direct engagement with schools and colleges and via Outreach Hubs. These include mentoring, campus visits, summer schools, skills and attainment workshops and subject masterclasses, as well as information, advice and guidance (IAG) on the benefits and realities of HE. These activities are delivered as stand-alone interventions and as part of a multi-intervention programme (sometimes referred to as a 'black box') which provides sustained and progressive support for learners. The aim of these activities and interventions is to ensure learners who take part in Uni Connect can make informed decisions about their education and develop the knowledge, skills, and confidence to progress to HE. More recently, partnerships have begun to deliver interventions with a focus on attainment raising, representing a further shift in the strategic priorities for the programme and HE outreach generally.

National evaluation of Uni Connect

In order to understand the impact of Uni Connect at the national level, CFE has been tracking changes in learners' intermediate outcomes over five years through a longitudinal survey. A baseline was set in the autumn term of the 2017-18 academic year with the first wave of the survey (W0). Four follow-up waves have subsequently

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5 Uni Connect learner population estimates are available online.

6 Phase One ran from January 2017 to July 2019. Phase Two ran from 1st August 2019 to 31st July 2021.

7 The programme began as the National Collaborative Outreach Programme (NCOP), funded initially by the Higher Education Funding Council for England (HEFCE). NCOP became known as Uni Connect in Phase Two and has since been funded by the OfS – the regulator for the HE sector in England launched in 2018.

8 See information on the OfS's strategy.

been conducted.[9] Data for the period W0 to Wave 3 (W3) was available for the impact analysis described in this report.[10]

Although the results of the impact analysis are presented here, the main focus of this report is the challenges of establishing the impact of Uni Connect at the programme level.[11] The report considers how the design of the programme, as well as factors such as Covid-19 and subsequent changes to Uni Connect targeting and delivery, have impacted on the evaluation and the analytical approaches possible at the W3 point. It also explores the methodological issues that have been encountered and the implications of data limitations for the robustness of the analysis and the conclusions that can be drawn at this stage. Insights from our experience inform key learning points which should be taken into consideration when planning and evaluating outreach programmes like Uni Connect in the future.

9 Follow-up surveys were conducted in the autumn terms of 2018-19 (Wave 1), 2019-20 (Wave 2), 2020-21 (Wave 3) and 2021-22 (Wave 4).

10 It is anticipated that the Wave 4 survey analysis will be published in autumn/winter 2022.

11 A separate report on the findings from the analysis of the W3 learner survey has been published along with a technical annexe at: https://www.officeforstudents.org.uk/publications/independent-evaluation-of-uni-connect-s-impact-on-outcomes/.

02. Approach to the impact evaluation

Uni Connect is based on a Theory of Change that *high-quality, impartial, sustained and progressive outreach will reduce barriers to access and increase the rate of progression to HE among learners who have the ability, but who are less likely to go, than other groups*. This theory is summarised in a logic model which details the activities being delivered through the programme and the associated outcomes and impacts that are expected to be achieved (Appendix 1). A bank of indictors was developed to measure change in these outcomes at the outset of the evaluation. These measures have formed the basis of the questions in the core learner survey since the baseline in 2017-18 (Appendix 2).

Learner survey

The aim of the national impact evaluation is to measure changes in intermediate outcomes for learners and establish whether these can be attributed to Uni Connect. The learner survey forms the central plank of the approach developed to achieve these aims. The survey comprises two parts: 'part 1' contains the core questions derived from the measures in the indicator bank which all respondents are asked. These have remained largely unaltered since W0 to enable changes over time to be measured. Additional questions capturing the perceived impact of Covid-19 on learners' education and engagement with Uni Connect were added at W3 so the effects of the pandemic could be accounted for in the analysis (Appendix 3). 'Part 2' contains questions developed by some partnerships for their local evaluations. Only learners who engage with the relevant partnership answer these questions and this data is not analysed for the national impact evaluation.

Survey administration

The survey is administered by most partnerships[12] via schools and colleges each year. Learners can complete the survey online (using a survey link provided by CFE or generated by a partnership using their own survey software) or by 'paper and pencil'. At each wave, partnerships have been strongly encouraged to target learners who responded to a previous wave of the survey to maximise the longitudinal sample. However, in practice, some schools and colleges adopt a census approach, administering it to whole classes or year groups to minimise burden. As a consequence, a high volume of responses from learners who have not completed a baseline and/or subsequent wave of the survey is collected each year and the sample comprises both Uni Connect target and non-target learners.

[12] Nine partnerships did not achieve sufficient responses to the baseline to be included in the subsequent follow-ups. All partnerships were invited to engage in the survey at W3 and W4. Responses from learners who engaged with 24 out of the 29 partnerships were received at W3.

Data linking

After each wave of the learner survey, partnerships input any data they have collected via 'paper and pencil' into a spreadsheet using a codebook provided by CFE. This, along with any online survey data collected using a partnership's own survey software, is cleaned and securely shared with CFE. CFE merges this data with the data collected via its online survey software to create a master dataset. This dataset is then matched to the datasets from previous survey waves using fuzzy matching techniques[13] to create a longitudinal dataset. This dataset is then matched with activity data collected by the tracking organisations.[14]

At W3, the longitudinal dataset was imported into the Office for National Statistics (ONS) Secure Research Service (SRS). The survey data was linked to key variables in the National Pupil Database (NPD) using unique identifiers. The key variables from the administrative data used for the purposes of the impact analysis were:

- Key Stage 2 (KS2) attainment – two standardised measures were generated based on learners' Standard Assessment Test (SAT) scores for Maths and English.[15]
- Measures of socio-economic disadvantage – Free School Meal (FSM) status.

Impact analysis

Comparing the outcomes of the treatment group (TG) (in this case, Uni Connect target learners who take part in the programme) with a control group (CG) (a group of learners with the same characteristics as the TG, but who do not take part in the programme) is one of the most robust ways to establish impact. Several factors impacted on the national evaluation team's ability to create a suitable control group to measure the impact of Uni Connect, including a high rate of attrition between survey waves and the approach to targeting and programme delivery.

At the end of Phase Two of Uni Connect, the aim was to establish the impact of the programme by measuring the *actual* change in learners' outcomes between baseline and W3, controlling for factors that are known to influence progression to HE including personal characteristics such as gender, ethnicity and socio-economic status, and prior educational attainment. Partnerships had a target to engage 20 per cent of target learners in Uni Connect. Other target learners (who did not engage in the programme) and non-target learners with similar characteristics who completed the survey offered potential comparison groups. However, there was high volume of attrition between each survey wave. At W3 just 1,935 learners who completed W0

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[13] Please refer to the technical annexe for the main report for further details of the matching techniques used.

[14] HEAT, EMWPREP and AWM

[15] KS2 outcomes changed in 2015-16. A standardised measure was created to account for changes in the way SATs scores were calculated for the cohorts participating in Uni Connect.

remained in the sample. The longitudinal sample was, therefore, too small to yield reliable results.

Although partnerships were tasked with targeting specific learners for Uni Connect interventions, in practice, a wider range of learners engaged in the activities. The targeting for Uni Connect was formally relaxed in 2020-21 to enable partnerships to engage with a broader range of under-represented groups[16] who had been particularly impacted by the restrictions imposed on schools and colleges because of Covid-19. Linking the survey data to tracking information reveals that Uni Connect is not a 'clean' treatment, in that many non-target learners receive the treatment and some target learners do not. Furthermore, those groups that are under-represented in HE or at particular institutions (including Uni Connect target learners) may also engage in other outreach activities delivered by individual HE providers as part of their wider access and participation (A&P) offer. Limited data on learner engagement in other outreach and on non-target learner engagement in Uni Connect was available for use in the analysis. As a result of all of these factors, an alternative approach had to be devised to assess the impact of the programme.

Approach

The impact analysis was carried out in several ways to overcome the issues with the available data and the impact of Covid-19 between W2 and W3 to provide a range of impact estimates. An artificial cohort was created to explore changes in 22 outcomes (Table 3, Appendix 4) for learners between Year 9 and Year 11 by comparing the W0 and W2 survey responses. Analysis to consider change in outcomes between W0 and W2 has previously been calculated but it was not possible to account for attainment in the analysis due to the administrative data not being available at this time.[17] A second artificial cohort was created to compare changes between Year 9 (W0) and Year 12 (W3).[18] For each comparison, we also carried out two different methods of analysis: an 'intention to treat' (ITT) and an 'average treatment effect on the treated' (ATT) (see below).

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[16] The OfS considers the following groups to be under-represented in HE and a priority for outreach: students from areas of low higher education participation, low household income or low socio-economic status; some black, Asian and minority ethnic (BAME) students; mature students; disabled students; care leavers; carers; people estranged from their families; people from Gypsy, Roma and Traveller communities; refugees; children from military families.

[17] The results of W0 and W2 are presented in the Phase Two end of year one report.

[18] The outcomes at W3 are likely to be atypical because the delivery of Uni Connect and the learner experience was severely impacted by Covid-19 restrictions.

Impact estimates were generated using a repeated cross-section difference-in-difference (DiD)[19] analysis. Kernel propensity score matching (PSM)[20] was used to match a CG to the TG because the sample of learners who responded to *both* the W0 and W2 and W0 and W3 surveys was too small (as explained above). PSM matches learners in the CG and TG on the basis of their propensity score; this is the predicted probability that any learner will be 'treated'. Kernel PSM matches each TG learner to a weighted sum of learners in the CG who have similar propensity scores, with greater weight given to learners with closer scores. To further increase the internal validity of our impact estimates we restricted the estimate to the area of 'common support'.[21]

In this repeated cross-section design, we do not follow the same learners over time. Instead, we compare outcomes for groups of learners that are constructed to be similar. The underlying assumption is that the outcomes for the matched CG are a good approximation of what would have happened to the outcomes of the TG if they had not received the Uni Connect 'treatment'. It is important to stress that we do not observe historical outcomes for either the TG or the CG, so we are not able to see whether or not these groups displayed similar trends in their outcomes prior to Uni Connect. An underlying assumption of DiD analysis is that the two groups shared 'common trends' prior to the intervention. As we are unable to explore this assumption, we cannot say with any degree of certainty that the outcomes achieved are a result of Uni Connect.

In all cases the relevant TG and CG are matched across a broad set of variables (Table 1 overleaf). These variables include demographic characteristics, indicators of socio-economic status and prior educational attainment.[22] Two variables that can be thought of as reflecting other unobserved differences between learners – whether they would be the first in their family to go into HE and whether or not they know someone in HE – were also used in the matching process. The (unmatched) variable means and sample sizes are shown in Appendix 5. This table includes all the matching variables and information on the Uni Connect treatment (hours of activity).

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[19] DID is a statistical technique used in econometrics and quantitative research in the social sciences. It attempts to mimic an experimental research design using observational study data by studying the differential effect of a treatment on a 'treatment group' versus a 'control group' in a natural experiment.

[20] Kernel PSM is a quasi-experimental method which uses statistical techniques to construct an artificial control group by matching the group of treated individuals with a group of non-treated individual with similar characteristics.

[21] There is a distribution of propensity scores for the TG and the CG and this method restricts estimation to the overlapping region of the two distributions. Learners from either group who have scores outside the range of the values of the other group are discarded.

[22] Note that in this repeated cross section analysis the samples are matched at both baseline and follow-up but the set of matching variables has to be the same at both time points, hence we can only match on learner prior attainment by Year 9 (i.e. KS2).

It is important to note that the matching is done for each outcome separately because sample sizes vary slightly by outcome (due to missing data). In all cases reported in the results we achieve a good balance between the CG and the TG on all variables, meaning that the groups are comparable across these variables. In all cases approximately 80% of observations fall within the area of common support.

Table 1: Definitions of variables used for matching the TG with the CG

Variable	Definition	Source
Sex	Female = 0, male = 1	Learner survey
Ethnicity	White= 0, BAME = 1	Learner survey
Disabled	Non-disabled = 0, disabled = 1	Learner survey
Free school meals	Non-FSM= 0, FSM =1	NPD
First in family to go to HE	Not first to go = 0, first to go = 1	Learner survey
Know someone in HE	Do not know anyone = 0, know someone = 1	Learner survey
Local deprivation	IDACI (Income Deprivation Affecting Children Index) score for local neighbourhood	MHCLG
Key Stage 2 maths*	Standardised raw KS2 maths score: pre-2015/16 = KS2_MATFINE, post 2015/16 = KS2_MATSCORE	NPD
Key Stage 2 reading*	Standardised raw KS2 reading maths score: pre-2015/16 = KS2_READFINE, post 2015/16 = KS2_READSCORE	NPD
Hours Activity	No. of hours of Uni Connect activity	Tracking data
No of Activities	No. of sessions of Uni Connect activity	Tracking data

**To ensure compatibility over time we use standardised scores derived to have a mean of zero and a standard deviation of 1.*

Intention-to-Treat (ITT)

The ITT analysis compares outcomes for the TG of *target* Uni Connect learners to a matched CG of *non-target* learners.[23] This method mimics actual delivery of the intervention; however, as explained above, the treatment is compromised because in both the TG and CG there are learners who did and did not engage in Uni Connect.

[23] Note that it is not possible to carry out repeated cross section impact analysis on target learners only as there is no way to distinguish the TG and CG at baseline. At baseline (Wave 0) no one has received the treatment and it is not possible to identify a priori who will/will not receive the treatment in the future; or who will get a low amount and who will get a high amount. This could only be done with longitudinal data.

As expected, neither the CG nor the TG received any Uni Connect activity at baseline (W0). By W2, the CG had received an average of 2.45 hours and the TG only slightly more at 2.48 hours; around 30% of both the CG and the TG had received some activity. By W3, the TG had received less hours on average than the CG (3.83 vs 4.08); however, 51% of the TG had received some level of activity, compared with 46% of the CG (Table 4Table 5, Appendix 5). It is worth stressing that this ITT impact analysis does not take into account actual hours of activity or whether or not learners received any activity; rather the comparison is based on whether or not the learner was in the Uni Connect target group or not.[24]

Average Treatment Effect on the Treated (ATT)

The ATT analysis employed here is biased towards finding an impact; it compares a CG of non-target learners who did not receive any Uni Connect activity, with a TG of target learners who did receive activity. This extreme assumption excludes any CG learners who received treatment and any TG learners who did not receive treatment. This does not reflect actual delivery of the intervention and is not realistic in terms of a real-world roll-out because it is unreasonable to assume 100% engagement with an intervention. In all survey waves (W0, W2 and W3) the CG received no hours of activity (by design). The TG received no activity in Wave 0, an average of 8.25 hours at W2 and an average at 7.54 hours by W3 (Table 5, Appendix 5). It is worth stressing that this ATT impact analysis does not take into account actual hours of activity, only whether or not target and non-target learners received any activity at all.

[24] As defined at the outset of the programme based on post code.

03. Results of the impact analysis

In this section, we present the impact estimates based on the ITT and ATT analysis for the W0 to W2 and the W0 to W3 cohorts.

Year 9 (W0) to Year 11 (W2)

ITT based on targeting

The full set of results for the ITT analysis comparing change in outcomes from Year 9 (W0) to Year 11 (W2) is presented in Table 6 in Appendix 6. Approximately 30 per cent of both the CG and the TG had received some activity by W2. There are significant *positive* impact estimates for six outcomes, as detailed below:

Level of knowledge

Outcome 4 asks learners about the extent of their knowledge on the **process of applying to HE** on a three-point scale (1 = nothing to 3 = a lot). At W0, the mean level of knowledge is 1.26 in the CG and 1.25 in the TG; a difference of (-0.01). By W2, the mean level of knowledge has *increased* to 1.54 in the CG, and 1.61 in the TG, a difference of (0.06). The level of knowledge has *increased* more in the TG, and the impact estimate (the difference in-difference) is 0.07, which is significant at $p < 0.01$.

Level of agreement with self-efficacy statements

Learners were asked the extent to which they agreed with a series of statements about how HE could impact them personally on a five-point scale (1 = strongly disagree and 5 = strongly agree). There are significant *positive* impact estimates for Outcome 15: **I have the academic ability to succeed in HE** and Outcome 18: **HE will challenge me intellectually**.

At W0, the mean level of agreement with Outcome 15 is 3.8[25] for both the CG and the TG. By W2, the mean level of agreement with this statement *decreased* to 3.7[20] for both groups, however, the decline was greater among the CG. The impact estimate (the DiD) is 0.08, which is significant at $p < 0.01$. A similar pattern emerges for Outcome 18. The mean level of agreement with this statement is 4.1 for the CG and 4.0 for the TG (a difference of -0.08). By W2, the mean level of agreement with this statement *decreased* to 3.9 for both the CG and the TG but once again, the decline was greater among the CG. The impact estimate (DiD) is 0.06, which is significant at $p < 0.05$.

[25] When means are rounded to one decimal place.

Level of agreement with benefits statements

Learners were also asked the extent to which they agreed with a series of statements about the potential benefits of HE on the same five-point scale (1 = strongly disagree and 5 = strongly agree). There are significant *positive* impact estimates for Outcome 20: **HE will improve my social life**, Outcome 21: **HE will enable me to earn more** and Outcome 22: **HE will enable me to get a better job**. The mean level of agreement with these statements *decreases* for the CG and *increases* for the TG between W0 and W2. The impact estimates (the difference in-difference) are 0.09, 0.08 and 0.09 respectively, which are significant at $p < 0.01$

ATT based on targeting and receipt of activity

The results for the ATT analysis comparing change from Year 9 (W0) to Year 11 (W2) are shown in Table 7Table 6 and Table 9 in Appendix 6 between the CG, that received no activity, and the TG that received an average of just over 8 hours activity. Overall, the results of the ATT analysis are similar to the ITT analysis; there are significant *positive* impact estimates for four of the six outcomes that were significant in the ITT:

- Outcome 4: **Knowledge of how to apply to HE** – mean level of knowledge goes *up* for both groups, but the increase is larger for the TG (DiD is 0.08).
- Outcome 15: **I have the academic ability to succeed in HE** – mean level of agreement goes *down* for both groups, but the decrease is larger for the CG (DiD is 0.08).
- Outcome 21: **HE will enable me to earn more** – mean level of agreement goes *down* for CG and goes *up* for the TG (DiD is 0.11).
- Outcome 22: **HE will enable me to get a better job** – mean level of agreement goes *down* for CG and goes *up* for the TG (DiD is 0.14). [26]

Although slighter fewer outcomes show significant effects, where they are significant, the impact estimates are slightly larger for the ATT than the ITT, which may be consistent with this more extreme form of analysis.

Year 9 (W) to Year 12 (W3)

ITT based on targeting

The results for the ITT analysis comparing change in outcomes from Year 9 (W0) to Year 12 (W3) are shown in Table 8, Appendix 6. In this case 50% of the TG received activity compared to 46% of the CG. There are significant *negative* impact estimates for five outcomes at $p < 0.05$; however, these come about in different ways, as explained below.

[26] The result for Outcome 15 is significant at $p < 0.05$, for all other outcomes it is $p < 0.01$.

Learners were asked about the extent to which they agreed or disagreed with the statements **I am motivated to do well in my studies** (Outcome 2) and **I would fit in well with others in HE** (Outcome 14) on a five-point scale (1 = strongly disagree and 5 = strongly agree). They were also asked how much knowledge they had on **where to find information about applying to HE** (Outcome 5) (on a three-point scale from 1 = nothing to 3 = a lot). Although these outcomes *decreased* for both the CG and TG over time, the reduction was *greater* for the TG (DiD is -0.10, -0.10 and -0.06 respectively).

Learners were also asked how much knowledge they had on **the qualifications and grades needed to get into HE** (Outcome 6) and **the costs of study** in HE (Outcome 9) (on a three-point scale from 1 = nothing to 3 = a lot). In this instance, the analysis suggests that the outcomes *improved* for the CG and got *worse* for the TG (DiD is -0.07 and -0.07 respectively).

ATT based on targeting and receipt of activity

The results for the ATT analysis comparing change from Year 9 (W0) to Year 12 (W3) are shown in Table 9, Appendix 6. Once again, the impact estimates show a significant *negative* impact for Outcome 9: knowledge of **the costs of study** in HE which improved for the CG and got worse for the TG (DiD is -0.10), mirroring the results of the ITT analysis.

This analysis identified a significant *positive* impact estimate for Outcome 22: **HE will enable me to get a better job.** In this case, although there was a reduction in the mean level of agreement with this statement amongst both groups, it fell more for the CG than for the TG (DiD is 0.11).

04. Insights and learning

The two impact estimates for the two cohorts that provided the basis for the analysis identified significant results at a minimum of $p > 0.05$ for 11 out of the 22 outcomes measured. There were, therefore, no statistically significant changes in half of the outcomes, including likelihood to apply to HE, when the TG and CG were compared.

There is a degree of consistency in the ITT and ATT results for the Year 9 (W0) to Year 11 (W2) analysis. However, findings from the ITT and ATT analysis for the Year 9 (W0) to Year 12 (W3) differ.[27] Furthermore, there is virtually no consistency in the results when the respective ITT and ATT analyses for each cohort are compared. The analysis of the changes in outcomes between Year 9 (W0) and Year 11 (W2) demonstrates largely *positive* effects, while the analysis of the changes in outcomes between Year 9 (W0) and Year 12 (W3) demonstrates largely *negative* effects. The positive impact estimates do not always signal an increase in outcomes for the TG compared with the CG; often there is a decrease in outcomes for both groups, but the reduction is lower for the TG, resulting in a positive result (Table 2).

Table 2: Summary of significant impact estimates for the ITT and ATT analysis for both cohorts

	Y9 (W0) to Y11 (W2)				Y9 (W0) to Y12 (W3)			
	ITT		ATT		ITT		ATT	
Outcome (positive impact / negative impact)	CG	TG	CG	TG	CG	TG	CG	TG
Motivated to do well in my studies (2)					<	<<		
Knowledge of how to apply to HE (4)	>	>>	>	>>				
Knowledge of where to find info about applying (5)					<	<<		
Knowledge on qualifications/grades needed (6)					>	<		
Knowledge of the costs of study (9)					>	<	>	<
I would fit in well with others (14)					<	<<		
Academic ability to succeed in HE (15)	<<	<	<<	<				
HE will challenge me intellectually (18)	<<	<						
HE will improve my social life (20)	<	>						
HE will enable me to earn more (21)	<	>	<	>				
HE enable me to get a better job (22)	<	>	<	>			<<	<

*Key: > = **increase** in outcome; >> = larger **increase** in outcome; < = **decrease** in outcome; << = larger **decrease** in outcome*

[27] The fewer significant results for the ATT analysis (W0 – W3) is not a result of smaller sample sizes resulting in larger standard errors; the coefficient sizes are generally smaller for the ATT.

We cannot definitively attribute the significant differences between the CG and the TG in the ITT analysis to Uni Connect because the CG and the TG received very similar levels of activity, both in terms of the average number of hours and whether they received any activity at all. The fact some positive impact estimates are still obtained suggests that these effects are not caused by Uni Connect, but rather reflect underlying, unobserved differences between the target and non-target learners. As we have not been able to explore pre-intervention trends in the outcomes, we are unable to explore or explain this further.

Although the CG in the ATT did not receive any 'treatment' from Uni Connect, the differences in the results for the two cohorts also suggest that other factors that cannot be observed are contributing to the differences between this group and the TG. These factors could include engagement in other forms of outreach delivered by individual HE providers which was not recorded in the tracking data that was linked to the longitudinal survey dataset and 'spill over' effects, whereby members of the CG indirectly benefit from the 'treatment' because they attend the same school and interact with their peers in the target group who receive the 'treatment' and share their knowledge and experience.

In an evaluation of this scale that seeks to measure change in a large number of potential outcomes through multiple comparisons some significant results would be expected. Although some significant findings have emerged, the results of the impact analyses summarised in Chapter 3 present a confusing picture. This makes it difficult, if not impossible, to draw any robust conclusions about the impact of Uni Connect at the programme level based on the results. Therefore, the findings contained within the end of Phase Two report[28] on the impact of Uni Connect are instead based on regression analysis that explores the characteristics (personal and programme) and wider factors (such as access to advisers and influencers and the perceived impact of Covid-19) that are associated with the outcomes achieved at the W3 position only.

Learning for future evaluations

Although the impact analysis has not been implemented as originally intended, or yielded the results hoped for at the outset, the process has provided some useful insights into the methodological challenges which should be considered, along with practical issues such as time and budget constraints, when planning impact evaluation of outreach activities in the future. The key learning points based on our experience are:

[28] CFE Research (2022) *An independent evaluation of Uni Connect's impact on intermediate outcomes for learners. A report for the OfS on the Wave 3 learner survey findings.*

Ensure a 'clean treatment'

The criteria for the treatment group should be clearly articulated, strictly implemented and remain unchanged for the duration of the programme to ensure only those who are targeted for the intervention receive it and enable the outcomes of those who take part in the programme to be compared with the outcomes of those who do not to establish impact.

Identify a suitable comparison group

The results of the analysis suggest that there are some fundamental differences between Uni Connect target and non-target learners which cannot be observed in the data. As such, non-target learners as a whole are unlikely to make a suitable comparison group because they are not sufficiently similar to the target group. Target learners who do not take part in the programme are likely to be a better match. However, there may still be unobserved differences between these learners and those who take part, including levels of self-confidence and motivation to engage in outreach, perceptions of the purpose and value of the programme and pre-existing attitudes to HE. Identifying schools and colleges that meet the criteria for the programme (rather than specific individuals within a school or college) and randomly-assigning them to a TG and CG would help to ensure a cleaner treatment (including by minimising spillover effects) and well-matched comparison group.

Alternative approaches to establishing impact

If a suitable comparison group cannot be created (for practical or ethical reasons), alternative approaches to establishing impact should be considered.

Our analysis explored the possibility of calculating the impact of Uni Connect based on a dosage effect. A dosage effect can be used to establish the impact of a programme or single intervention on target learners *only* by comparing the outcomes of those who receive a 'low dose' with those who receive a 'high dose', defined in terms of number of hours of engagement or number or types of activity engaged in. The success of this approach is contingent on comprehensive and consistent tracking data and a low rate of attrition between survey waves to ensure the sample for each group is large enough to facilitate a comparison.

Another alternative method is a 'waiting list' trial design where some TG learners are initially excluded from the treatment and assigned to the CG so their outcomes can be measured and compared with the TG before they themselves receive the treatment at a later stage. This method helps to overcome ethical concerns associated withholding activity from learners who could potentially benefit from it, as everyone receives it eventually. Implementing this method for a national programme evaluation would present some challenge; however, it could be a viable option to explore the impact of individual outreach activities.

Maximise the longitudinal sample available for analysis

The learner survey for the national impact evaluation of Uni Connect sought to measure changes in 24 outcomes[29] that wider evidence suggests could be associated with the likelihood of a young person progressing to HE. A vast amount of data has been collected over the first four waves of the learner survey, but it has only been possible to use a small proportion of it for the purposes of national impact evaluation.[30] This is because, at each wave, responses were collected from learners who had not completed the baseline and from learners who were not a suitable comparison for the Uni Connect target group. The final sample comprised a disproportionate number of responses from a minority of partnerships. Although the characteristics of the sample were broadly representative of the target population, the sample was not representative of all partnerships. This had implications for the robustness of the analysis at a programme level.

To measure change in outcomes over time, data must be collected from both the TG and CG at each sampling point. Mechanisms must be put in place to minimise the risk of attrition between survey waves and to ensure the longitudinal sample achieved is representative of the baseline and the wider population. For national programmes delivered at a local level, it is essential for all delivery partners to participate in data collection to ensure the sample is representative. Ideally baseline survey respondents should be tracked individually so they can be targeted for subsequent waves of the survey.

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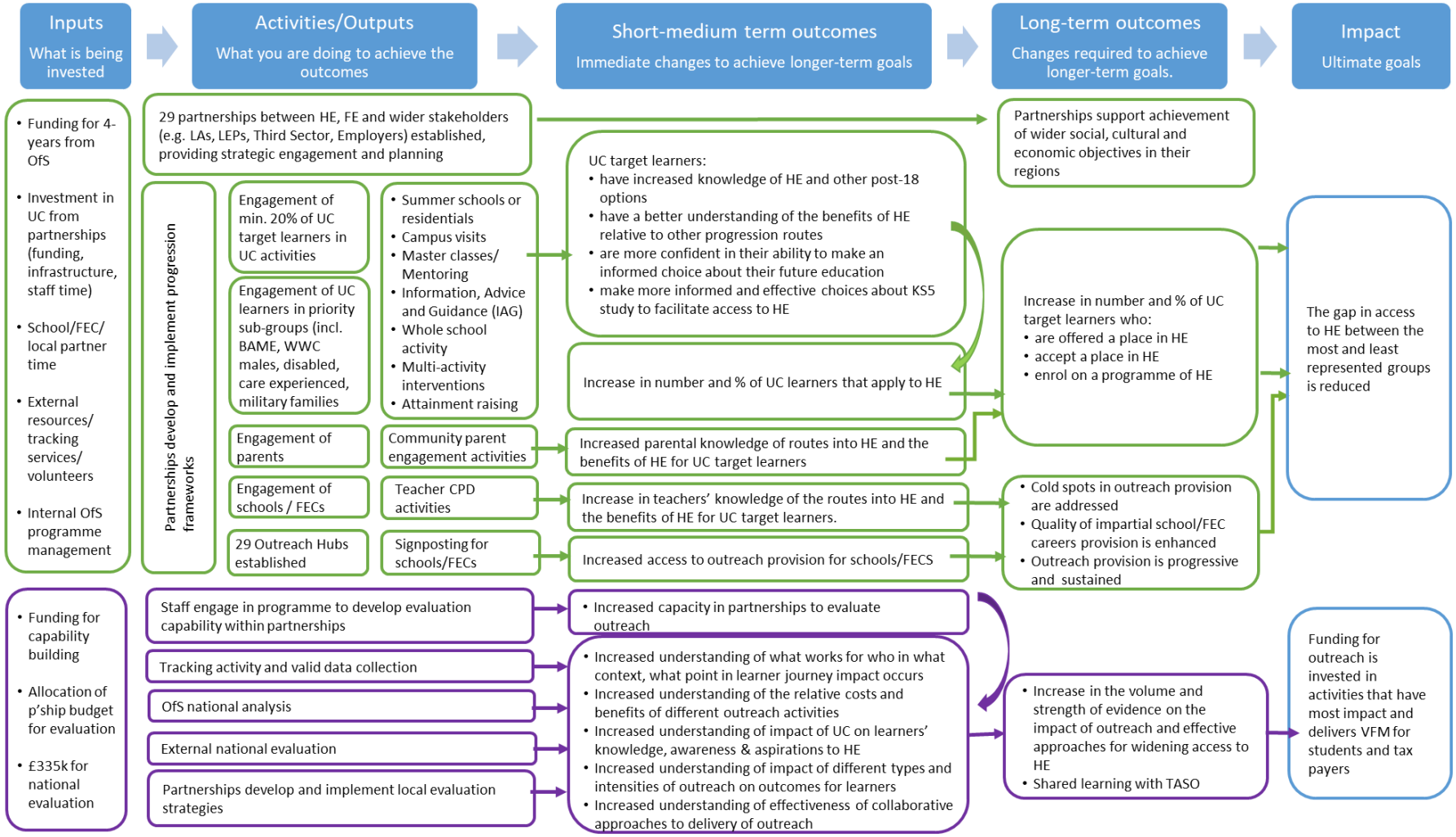
[29] Only 22 outcomes are included in the analysis at W3 because the wording of two outcomes changed between survey waves.

[30] Wider data has been used by partnerships for the purposes of their local evaluations.

APPENDIX 1: LOGIC MODEL FOR THE NATIONAL EVALUATION OF UNI CONNECT



Assumptions

- Partnerships provide strategic leadership, management and governance arrangements to maintain delivery of a collaborative approach
- Partnerships implement strategic plans to deliver a sustained and progressive programme of targeted outreach for young people in Years 9 and upwards in target wards
- Partnerships effectively engage with schools/FECs/SFCs and other stakeholders to target and deliver their activities
- Partnerships adapt their approach/activities to reflect changes in the local and/or national context
- Young people are on track to achieve the necessary levels of attainment at KS4 and KS5 to progress to HE
- Partnerships use data and emerging findings from evaluations to adapt and change their approach
- UC activity is aligned with broader outreach activity and outreach hubs

APPENDIX 2: WAVE 3 SURVEY – PART 1 (CORE) QUESTIONS

1. Which year of study are you in?

❍ School - year 9
❍ School - year 10
❍ School - year 11
❍ College - level 2
❍ Sixth form - year 12 (lower sixth)
❍ Sixth form - year 13 (upper sixth)
❍ College - level 3 - year 1
❍ College - level 3 - year 2

2. When you finish your current studies, what would you most like to do next? [response options routed according to Key Stage]

❍ Study at school or a sixth-form college
❍ Study at a further education college
❍ Get a full-time job
❍ Get a part-time job
❍ Study higher education at a further education college or other further education provider
❍ Study at a local university or another higher education institution
❍ Study away from home at university or another higher education institution
❍ Get a job and study at the same time
❍ Begin an apprenticeship
❍ Begin a higher/degree apprenticeship
❍ Take a gap year
❍ Other (*please specify*)_____
❍ Don't know

3. Who have you spoken to about higher education?

❑ Family
❑ Friend(s)
❑ Teacher(s)
❑ Careers adviser(s)
❑ Other (*please specify*) _____
❍ Nobody

4. *Apart from yourself*, who has had the greatest influence on your decision about what to do next?

❍ Family
❍ Friend(s)
❍ Teacher(s)
❍ Careers adviser(s)
❍ Other (*please specify*) _____

5. How much do you agree with the following statements?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
I am motivated to do well in my studies	○	○	○	○	○	○
I can get the grades I need for further study	○	○	○	○	○	○
I believe I could go to university if I wanted to	○	○	○	○	○	○

6. How much do you know about the following things about higher education?

	Nothing	A little	A lot
The subjects that you could study	○	○	○
Different types of course, such as: degree, foundation degree, or higher/degree apprenticeships	○	○	○
How to apply to study higher education	○	○	○
Where to find information about applying	○	○	○
The qualifications and grades needed to get into higher education	○	○	○

7. How much do you know about the following aspects of higher education?

	Nothing	A little	A lot
What student life would be like	○	○	○
How it leads to careers that you may be interested in	○	○	○
The costs of study	○	○	○
The financial support available	○	○	○
The options about where to live whilst studying	○	○	○

8. Have you applied to study at higher education? [Sixth form year 13 (upper sixth) or College level 3 (year 2) only],

Yes	○	*Please go to question 11*
No	○	*Please go to question 9*

9. How likely are you to apply to higher education at age 18 or 19?

Definitely won't apply	○	*Please go to question 10*
Very unlikely	○	*Please go to question 10*
Fairly unlikely	○	*Please go to question 10*
Fairly likely	○	*Please go to question 11*
Very likely	○	*Please go to question 11*
Definitely will apply	○	*Please go to question 11*
Don't know	○	*Please go to question 10*

10. What is the main reason you might NOT go on to study higher education?

❍ My current qualifications are enough
❍ I have decided on a specific career (that does not require further study)
❍ I want to work and earn money
❍ The cost is too much
❍ It depends on the grades I get
❍ I don’t have the necessary study skills
❍ It does not appeal to me
❍ I want to travel
❍ I am still undecided
❍ There is nowhere close enough to home
❍ Other reason (*please specify*) _____

11. What is the main reason you want to go to higher education?

❍ I enjoy learning
❍ To enable me to get a well-paid job
❍ It's what my parents expect me to do
❍ It's what all my friends are planning to do
❍ My teachers have encouraged me to go
❍ I don't know what else to do
❍ I don't feel ready to start working yet
❍ Other reason (*please specify*) _____

12. How much do you agree with the following statements about higher education?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
It is for people like me	○	○	○	○	○	○
I would fit in well with others	○	○	○	○	○	○
I have the academic ability to succeed	○	○	○	○	○	○
I could cope with the level of study required	○	○	○	○	○	○

13. How much do you agree with the following statements about higher education?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
It will broaden my horizons	○	○	○	○	○	○
It will challenge me intellectually	○	○	○	○	○	○
It will give me valuable life skills	○	○	○	○	○	○
It will improve my social life	○	○	○	○	○	○
It will enable me to earn more	○	○	○	○	○	○
It will enable me to get a better job	○	○	○	○	○	○

14. If you go on to higher education, would you be the first person in your immediate family to go?

❍ Yes
❍ No - my grandparent(s) went first
❍ No - my parent(s) or guardian(s) went first
❍ No - my brother(s) or sister(s) went first
❍ Don't know

15. Do you know somebody else who has gone on to higher education?

Please select all that apply

❍ No
❑ Yes - another family member
❑ Yes - a friend
❍ Don't know
❑ Other (please specify)_____

16. Do you have a disability, learning difficulty or long-term physical or mental health condition?

❍ Yes
❍ No
❍ Prefer not to say

17. What is your gender?

❍ Female
❍ Male
❍ Other
❍ Prefer not to say

18. Which of the following ethnic groups do you belong to?

❍ White - British
❍ White - Irish
❍ White - Scottish
❍ Other White background
❍ Black or Black British - Caribbean
❍ Black or Black British - African
❍ Other Black background
❍ Mixed White and Black Caribbean
❍ Mixed White and Black African
❍ Asian or Asian British - Indian
❍ Asian or Asian British - Pakistani
❍ Asian or Asian British – Bangladeshi
❍ Other Asian background
❍ Mixed White and Asian
❍ Chinese
❍ Arab
❍ Irish Traveller
❍ Gypsy or Traveller
❍ Other ethnic background
❍ Any other mixed background
❍ Prefer not to say

APPENDIX 3: ADDITIONAL QUESTIONS FOR WAVE 3 SURVEY

Has Covid-19 influenced your decision about what to do next?

- ○ No, not at all
- ○ Yes, to some extent
- ○ Yes, a great deal
- ○ I'm not sure

Where did you study between March and July 2020 during the Covid-19 lockdown?

- ○ I stayed in school / college (1)
- ○ I went to school/college and studied from home (2)
- ○ I studied from home (3)

[Respondents who studies from home all or some of the time] Did any of the following make it more difficult for you to continue learning at home? Please tick all that apply

- ○ Lack of a computer that you could use for your school/college work
- ○ Lack of other equipment or resources that you would normally have in school/college to help you learn
- ○ Poor or no Wi-Fi connection at home
- ○ Limited contact with tutor and/or subject teachers at school/college
- ○ Lack of a quiet space to study
- ○ Being asked to help out with other family members, such as younger brothers and sisters
- ○ Parents/carers unable to help with school/college work
- ○ Nothing, I had everything I needed to continue learning at home [exclusive]

Has Covid-19 affected your decision about whether or not to apply to higher education at age 18 or 19?

- ○ Yes, I'm now more likely to apply
- ○ Yes, I'm now less likely to apply
- ○ No, I'm just as likely to apply to now as I was before Covid-19
- ○ I'm not sure

What is the main reason you want to go to higher education? [Option added to core question 11]

- ❍ It will be too hard to get a job because of Covid-19

What is the main reason you might not go on to higher education? [Option added to core question 10]

- ❍ Covid-19 has put me off going to higher education

APPENDIX 4: OUTCOMES MEASURED IN LEARNER SURVEY

Table 3: Output definitions

Outcome No.	Name	Question
1	NEXT	What do you want to do next? 1 = continue in education; 0 = not continue in education.
2	MOTIV	I am motivated to do well in my studies. (1 = strongly disagree 5 = strongly agree)
3	GRADES	I could get the grades I need for further study. (1 = strongly disagree: 5 = strongly agree)
4	UCAS	Knowledge of how to apply to HE. (1 = nothing: 3 = a lot)
5	INFO	Knowledge of where to find information in applying. (1 = nothing: 3 = a lot)
6	QUALS	Knowledge of grades needed to get into the course you want. (1 = nothing: 3 = a lot)
7	STUD	Knowledge of what student life would be like. (1 = nothing: 3 = a lot)
8	CAREER	Knowledge of how it leads to careers you are interested in. (1 = nothing: 3 = a lot)
9	COST	Knowledge of the costs of study. (1 = nothing: 3 = a lot)
10	FIN	Knowledge of the financial support available. (1 = nothing: 3 = a lot)
11	LIVE	Knowledge of the options of where to live while studying. (1 = nothing: 3 = a lot)
12	APPLY	Have you applied (are you likely to apply) to HE? (1 = yes: 0 = no)
13	LIKEME	It is for people like me. (1 = strongly disagree: 5 = strongly agree)
14	FITIN	I would fit in well with others. (1 = strongly disagree: 5 = strongly agree)
15	ACAD	I have the academic ability to succeed. (1 = strongly disagree: 5 = strongly agree)
16	COPE	I could cope with the level of study required. (1 = strongly disagree: 5 = strongly agree)
17	BROAD	It would broaden my horizons. (1 = strongly disagree : 5 = strongly agree)
18	CHALL	It would challenge me intellectually. (1 = strongly disagree : 5 = strongly agree)
19	VALU	It would give me valuable life skills. (1 = strongly disagree : 5 = strongly agree)
20	SOC	It would improve my social life. (1 = strongly disagree : 5 = strongly agree)
21	EARN	It would enable me to earn more. (1 = strongly disagree : 5 = strongly agree)
22	JOB	It would enable me to get a better job. (1 = strongly disagree : 5 = strongly agree)

APPENDIX 5: DESCRIPTIVE STATISTICS

Table 4: ITT samples

ITT Samples	Control group (CG)								Treatment group (TG)							
	Wave 0			Wave 2			Wave 3		Wave 0			Wave 2			Wave 3	
	mean	n		mean	n		mean	n	mean	n		mean	n		mean	n
Hours of activity	0	3286		2.448	5339		4.081	1831	0	5391		2.482	4204		3.831	1563
Any activity	0	3286		0.304	5339		0.457	1831	0	5391		0.300	4204		0.508	1563
Sex (male)	0.488	3177		0.458	5170		0.441	1761	0.443	5223		0.461	4057		0.450	1494
Ethnicity (BAME)	0.159	3215		0.139	5222		0.132	1791	0.148	5288		0.151	4111		0.153	1518
Disabled	0.129	3286		0.145	5339		0.152	1831	0.145	5391		0.170	4204		0.171	1563
Free school meals	0.340	3176		0.343	5209		0.295	1828	0.341	5225		0.356	4111		0.312	1559
First to go to HE	0.561	3286		0.515	5339		0.454	1831	0.637	5391		0.606	4204		0.583	1563
Know someone in HE	0.712	3228		0.722	5247		0.738	1803	0.638	5320		0.670	4134		0.687	1535
Local deprivation	0.154	3286		0.147	5339		0.146	1831	0.269	5391		0.268	4204		0.269	1563
KS2 maths	0.019	3254		0.059	5300		0.182	1812	0.006	5356		0.005	4164		0.107	1549
KS2 reading	-0.029	2819		-0.013	4726		0.176	1806	-0.038	4606		-0.017	3720		0.124	1544

Note: For variable definitions see Table 1. Local deprivation, KS2 maths and KS2 reading are scores; all other variables are binary hence in these latter cases the means indicate proportions.

Table 5: ATT samples

	Control group (CG)								Treatment group (TG)						
	Wave 0		Wave 2			Wave 3			Wave 0		Wave 2			Wave 3	
	mean	n	mean	n		mean	n		mean	n	mean	n		mean	n
Hours of activity	0	3286	0	3715		0	993		0	5391	8.255	1264		7.542	794
Any activity	0	3286	0	3715		0	993		0	5391	1	1264		1	794
Sex (male)	0.488	3177	0.464	3594		0.442	954		0.443	5223	0.475	1214		0.457	762
Ethnicity (BAME)	0.159	3215	0.134	3632		0.146	967		0.148	5288	0.156	1239		0.156	778
Disabled	0.129	3286	0.148	3715		0.159	993		0.145	5391	0.187	1264		0.181	794
Free school meals	0.340	3176	0.341	3590		0.302	991		0.341	5225	0.355	1263		0.315	793
First to go to HE	0.561	3286	0.515	3715		0.443	993		0.637	5391	0.597	1264		0.582	794
Know someone in HE	0.712	3228	0.723	3655		0.749	986		0.638	5320	0.673	1240		0.676	772
Local deprivation	0.154	3286	0.148	3715		0.151	993		0.269	5391	0.269	1264		0.263	794
KS2 maths	0.019	3254	0.044	3682		0.158	980		0.006	5356	0.081	1258		0.115	788
KS2 reading	-0.029	2819	-0.024	3202		0.156	977		-0.038	4606	0.024	1200		0.111	786

Note: For variable definitions see Table 1. Local deprivation, KS2 maths and KS2 reading are scores; all other variables are binary hence in these latter cases the means indicate proportions.

APPENDIX 6: IMPACT ESITMATES

Table 6: Year 9 (Wave 0) to Year 11 (Wave 2), ITT results

	1 out1_next	2 out2_motiv	3 out3_grades	4 out4_ucas	5 out5_info	6 out6_quals	7 out7_stud	8 out8_career	9 out9_cost	10 out10_fin	11 out11_live
DiD impact estimate	0.0112	-0.0421	0.00695	0.0721***	0.0297	0.0322	0.0321	0.0225	0.0144	0.0351	0.0385
	(0.0154)	(0.0280)	(0.0273)	(0.0184)	(0.0217)	(0.0213)	(0.0208)	(0.0207)	(0.0240)	(0.0225)	(0.0228)
Observations	12,531	14,677	13,753	14,700	14,741	14,797	14,375	14,353	14,329	14,336	14,344
Mean CG time = 0	0.766	4.256	4.023	1.256	1.798	2.036	1.975	2.052	1.864	1.687	1.837
Mean TG time = 0	0.723	4.273	4.019	1.246	1.795	2.024	1.977	2.056	1.855	1.669	1.833
Diff t(0)	-0.0422	0.0176	-0.00411	-0.0103	-0.00287	-0.0123	0.00199	0.00328	-0.00824	-0.0186	-0.00434
Mean CG time = 1	0.794	4.276	3.915	1.544	1.787	1.988	1.952	2.070	1.899	1.682	1.852
Mean TG time = 1	0.763	4.251	3.918	1.606	1.814	2.008	1.987	2.096	1.905	1.698	1.886
Diff t(1)	-0.0310	-0.0244	0.00284	0.0618	0.0268	0.0199	0.0341	0.0257	0.00621	0.0165	0.0342

	12 out12_apply	13 out13_likeme	14 out14_fitin	15 out15_acad	16 out16_cope	17 out17_broad	18 out18_chall	19 out19_valu	20 out20_soc	21 out21_earn	22 out22_job
DiD impact estimate	-0.00632	0.0373	0.00948	0.0838***	0.0555	-0.0533	0.0639**	0.0516	0.0913***	0.0819***	0.0908***
	(0.0434)	(0.0321)	(0.0326)	(0.0294)	(0.0323)	(0.0305)	(0.0269)	(0.0276)	(0.0329)	(0.0274)	(0.0271)
Observations	12,550	12,751	12,848	13,135	12,529	12,524	13,543	13,806	13,515	13,641	13,916
Mean CG time = 0	4.465	3.517	3.595	3.841	3.684	3.881	4.115	4.130	3.834	4.197	4.338
Mean TG time = 0	4.410	3.474	3.574	3.770	3.629	3.875	4.039	4.088	3.789	4.111	4.277
Diff t(0)	-0.0547	-0.0430	-0.0204	-0.0707	-0.0554	-0.00650	-0.0755	-0.0419	-0.0450	-0.0854	-0.0615
Mean CG time = 1	4.322	3.342	3.467	3.674	3.499	3.908	4.045	4.065	3.760	4.170	4.267
Mean TG time= 1	4.261	3.337	3.456	3.688	3.499	3.848	4.034	4.075	3.806	4.166	4.297
Diff t(1)	-0.0610	-0.00567	-0.0109	0.0132	0.000136	-0.0598	-0.0116	0.00973	0.0463	-0.00354	0.0293

Notes: Observations refers to the total No. of observations available across Wave 0, Wave 2, the CG and the TG. For individual cell sizes see Table 4. Standard errors in parentheses. *** p<0.01, ** p<0.05. For output definitions Appendix 4 Table 3.

Table 7: Year 9 (Wave 0) to Year 11 (Wave 2), ATT results

	(1) out1_next	(2) out2_motiv	(3) out3_grades	(4) out4_ucas	(5) out5_info	(6) out6_quals	(7) out7_stud	(8) out8_career	(9) out9_cost	(10) out10_fin	(11) out11_live
DiD impact estimate	0.00584	-0.0637	-0.0120	0.0775***	0.0359	0.0496	0.0524	-0.00838	0.00939	0.0207	0.0471
	(0.0227)	(0.0404)	(0.0388)	(0.0249)	(0.0307)	(0.0307)	(0.0298)	(0.0299)	(0.0344)	(0.0325)	(0.0328)
Observations	9,436	10,873	10,198	10,880	10,927	10,971	10,767	10,743	10,725	10,729	10,742
Mean CG time = 0	0.766	4.256	4.023	1.256	1.798	2.036	1.975	2.052	1.864	1.687	1.837
Mean TG time = 0	0.723	4.273	4.019	1.246	1.795	2.024	1.977	2.056	1.855	1.669	1.833
Diff t(0)	-0.0423	0.0175	-0.00409	-0.0103	-0.00297	-0.0123	0.00208	0.00326	-0.00836	-0.0185	-0.00432
Mean CG time = 1	0.788	4.275	3.935	1.552	1.803	1.993	1.950	2.090	1.914	1.680	1.844
Mean TG time = 1	0.751	4.228	3.919	1.620	1.836	2.030	2.005	2.085	1.915	1.682	1.887
Diff t(1)	-0.0365	-0.0462	-0.0161	0.0672	0.0329	0.0374	0.0545	-0.00512	0.00103	0.00217	0.0428

	(12) out12_apply	(13) out13_likeme	(14) out14_fitin	(15) out15_acad	(16) out16_cope	(17) out17_broad	(18) out18_chall	(19) out19_valu	(20) out20_soc	(21) out21_earn	(22) out22_job
DiD impact estimate	0.0117	0.0345	0.0349	0.0843**	0.0548	-0.0809	0.0499	0.0544	0.0876	0.110***	0.137***
	(0.0614)	(0.0452)	(0.0461)	(0.0413)	(0.0450)	(0.0432)	(0.0380)	(0.0390)	(0.0467)	(0.0387)	(0.0380)
Observations	9,308	9,414	9,518	9,683	9,241	9,211	9,975	10,209	9,946	10,035	10,269
Mean CG time = 0	4.465	3.516	3.595	3.841	3.684	3.881	4.115	4.130	3.834	4.197	4.338
Mean TG time = 0	4.410	3.473	3.574	3.770	3.629	3.875	4.039	4.089	3.789	4.111	4.277
Diff t(0)	-0.0543	-0.0430	-0.0203	-0.0707	-0.0552	-0.00666	-0.0757	-0.0417	-0.0449	-0.0852	-0.0616
Mean CG time = 1	4.314	3.350	3.464	3.678	3.518	3.921	4.052	4.051	3.749	4.156	4.227
Mean TG time = 1	4.271	3.342	3.479	3.692	3.517	3.834	4.026	4.064	3.792	4.180	4.303
Diff t(1)	-0.0426	-0.00847	0.0145	0.0136	-0.000393	-0.0876	-0.0258	0.0128	0.0427	0.0244	0.0755

Notes: Observations refers to the total No. of observations available across Wave 0, Wave 2, the CG and the TG. For individual cell sizes see Table 4. Standard errors in parentheses. *** p<0.01, ** p<0.05. For output definitions see Appendix 4 Table 3.

Table 8: Year 9 (Wave 0) to Year 12 (Wave 3), ITT results

	(1) out1_next	(2) out2_motiv	(3) out3_grades	(4) out4_ucas	(5) out5_info	(6) out6_quals	(7) out7_stud	(8) out8_career	(9) out9_cost	(10) out10_fin	(11) out11_live
DiD impact estimate	-0.0245	-0.0957**	-0.0751	0.00884	-0.0601**	-0.0649**	-0.00970	-0.0502	-0.0697**	-0.0241	-0.0566
	(0.0214)	(0.0401)	(0.0386)	(0.0243)	(0.0300)	(0.0299)	(0.0287)	(0.0287)	(0.0329)	(0.0308)	(0.0310)
Observations	8,819	9,894	9,279	9,920	9,955	10,007	10,029	10,016	9,999	10,000	10,017
Mean CG time = 0	0.766	4.256	4.023	1.256	1.798	2.036	1.975	2.052	1.864	1.687	1.837
Mean TG time = 0	0.723	4.273	4.019	1.246	1.795	2.024	1.976	2.055	1.855	1.669	1.833
Diff t(0)	-0.0422	0.0175	-0.00409	-0.0103	-0.00297	-0.0123	0.00194	0.00312	-0.00837	-0.0185	-0.00429
Mean CG time = 1	0.839	4.204	3.959	1.600	1.791	2.061	1.907	2.098	1.915	1.650	1.862
Mean TG time = 1	0.772	4.126	3.880	1.599	1.728	1.984	1.899	2.051	1.837	1.608	1.802
Diff t(1)	-0.0668	-0.0781	-0.0792	-0.00143	-0.0631	-0.0771	-0.00776	-0.0470	-0.0781	-0.0426	-0.0609

	(12) out12_apply	(13) out13_likeme	(14) out14_fitin	(15) out15_acad	(16) out16_cope	(17) out17_broad	(18) out18_chall	(19) out19_valu	(20) out20_soc	(21) out21_earn	(22) out22_job
DiD impact estimate	-0.0698	-0.0524	-0.102**	-0.0135	-0.0210	-0.0670	-0.0119	-0.0514	-0.0110	0.0474	0.0716
	(0.0598)	(0.0449)	(0.0449)	(0.0407)	(0.0441)	(0.0427)	(0.0370)	(0.0375)	(0.0455)	(0.0377)	(0.0369)
Observations	8,493	8,525	8,677	8,860	8,507	8,357	9,086	9,336	9,058	9,126	9,364
Mean CG time = 0	4.465	3.516	3.595	3.841	3.685	3.881	4.115	4.130	3.834	4.196	4.338
Mean TG time = 0	4.410	3.473	3.574	3.770	3.629	3.875	4.039	4.089	3.789	4.112	4.277
Diff t(0)	-0.0543	-0.0430	-0.0203	-0.0707	-0.0554	-0.00696	-0.0755	-0.0417	-0.0449	-0.0848	-0.0613
Mean CG time = 1	4.466	3.377	3.525	3.750	3.520	3.976	4.115	4.119	3.797	4.137	4.254
Mean TG time = 1	4.342	3.282	3.403	3.666	3.444	3.902	4.028	4.026	3.741	4.099	4.265
Diff t(1)	-0.124	-0.0954	-0.122	-0.0842	-0.0765	-0.0740	-0.0874	-0.0930	-0.0559	-0.0374	0.0103

Notes: Observations refers to the total No. of observations available across Wave 0, Wave 2, the CG and the TG. For individual cell sizes see Table 4. Standard errors in parentheses. *** p<0.01, ** p<0.05. For output definitions see Appendix 4 Table 3.

Table 9: Year 9 (Wave 0) to Year 12 (Wave 3), ATT results

	(1) out1_next	(2) out2_motiv	(3) out3_grades	(4) out4_ucas	(5) out5_info	(6) out6_quals	(7) out7_stud	(8) out8_career	(9) out9_cost	(10) out10_fin	(11) out11_live
DiD impact estimate	-0.00810	-0.0972	-0.0262	-0.0205	-0.0633	-0.0427	-0.0142	-0.0109	-0.0977**	0.0199	-0.0793
	(0.0289)	(0.0532)	(0.0511)	(0.0315)	(0.0398)	(0.0399)	(0.0383)	(0.0382)	(0.0439)	(0.0412)	(0.0413)
Observations	7,585	8,470	7,947	8,476	8,516	8,562	8,589	8,576	8,558	8,560	8,574
Mean CG time = 0	0.766	4.256	4.023	1.256	1.798	2.036	1.975	2.052	1.864	1.687	1.837
Mean TG time = 0	0.723	4.273	4.019	1.246	1.795	2.024	1.976	2.055	1.855	1.669	1.833
Diff t(0)	-0.0422	0.0175	-0.00409	-0.0103	-0.00297	-0.0123	0.00194	0.00312	-0.00837	-0.0185	-0.00429
Mean CG time = 1	0.827	4.194	3.928	1.635	1.802	2.052	1.911	2.083	1.930	1.642	1.882
Mean TG time = 1	0.776	4.114	3.897	1.604	1.735	1.997	1.899	2.075	1.824	1.643	1.798
Diff t(1)	-0.0503	-0.0797	-0.0303	-0.0308	-0.0663	-0.0550	-0.0123	-0.00782	-0.106	0.00132	-0.0836

	(12) out12_apply	(13) out13_likeme	(14) out14_fitin	(15) out15_acad	(16) out16_cope	(17) out17_broad	(18) out18_chall	(19) out19_valu	(20) out20_soc	(21) out21_earn	(22) out22_job
DiD impact estimate	-0.0891	0.0212	-0.0938	0.0565	0.00779	-0.0294	0.00530	-0.0497	0.00587	0.0812	0.113**
	(0.0796)	(0.0597)	(0.0593)	(0.0536)	(0.0579)	(0.0562)	(0.0493)	(0.0501)	(0.0605)	(0.0502)	(0.0489)
Observations	7,242	7,272	7,391	7,553	7,238	7,124	7,759	7,964	7,735	7,792	8,008
Mean control t(0)	4.465	3.516	3.595	3.841	3.685	3.881	4.115	4.130	3.834	4.196	4.338
Mean treated t(0)	4.410	3.473	3.574	3.770	3.629	3.875	4.039	4.089	3.789	4.112	4.277
Diff t(0)	-0.0543	-0.0430	-0.0203	-0.0707	-0.0554	-0.00696	-0.0755	-0.0417	-0.0449	-0.0848	-0.0613
Mean control t(1)	4.459	3.323	3.506	3.733	3.481	3.951	4.088	4.106	3.769	4.089	4.193
Mean treated t(1)	4.316	3.302	3.392	3.719	3.434	3.915	4.018	4.015	3.730	4.086	4.244
Diff t(1)	-0.143	-0.0218	-0.114	-0.0142	-0.0477	-0.0364	-0.0702	-0.0913	-0.0391	-0.00357	0.0515

Notes: Observations refers to the total No. of observations available across Wave 0, Wave 2, the CG and the TG. For individual cell sizes see Table 4. Standard errors in parentheses. *** p<0.01, ** p<0.05. For output definitions see Appendix 4 Table 3.