Evaluation of Children's University, effectiveness trial

Evaluation Report

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About the evaluator

The project was independently evaluated by a team from the National Foundation for Educational Research (NFER). The trial director and principal investigator for this study was Pippa Lord (Trials Director, NFER Education Trials Unit). Palak Roy (Senior Trials Manager in the NFER's Education Trials Unit) led the evaluation team and the impact evaluation. The implementation and process evaluation (IPE) was initially led by NFER research associates Lisa O'Donnell and Kelly Kettlewell. Lillian Flemons (Research Manager) assumed this role after them. Eleanor Bradley (Researcher) was the IPE researcher. Chris Morton (Senior Statistician) and Afrah Dirie (in their former role as a senior statistician at NFER) were the trial statisticians and Sarah Tang contributed to the cost evaluation component. They were supported by the research operations team at NFER for the collection of evaluation data and liaising with participants. The NFER operations team included: Kathryn Hurd; Kathryn Gallop; Guido Miani; Priscilla Antwi; and Katharine Stoodley.

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Executive summary

The project

The Children's University programme aims to improve the aspirations, attainment, and love of learning of pupils by encouraging, tracking, and celebrating participation in extracurricular structured learning activities such as after-school clubs, enrichment, and online activities, which must be validated by a Children's University Manager (CU Manager) or Children's University school coordinator (CU Coordinator). Participation in these activities is intended to impact on pupils' learning and attainment, and a range of wider non-attainment outcomes including developing pupils' character, self-esteem, resilience, motivation to learn, and life skills beyond the school curriculum, which are hypothesised to influence attainment in the longer term.

For this trial, the Children's University programme was made available to all Year 5 pupils in intervention schools who wished to participate. Participating pupils were in Year 6 for the second year of the trial. Pupils receive stamps in their Children's University passport and hours of participation are recorded on the Children's University Online (CUO) digital platform. Awards are given to pupils who complete a minimum of 30 hours of participation during graduation ceremonies. Local Children's University teams provide ongoing support to participating schools, including sourcing learning opportunities, training staff, and working with schools to validate in-school activities. Schools nominate a lead staff member as a CU coordinator, who oversees programme delivery and pupil participation.

This two-armed effectiveness trial, randomised at school level, aimed to understand if the Children's University programme is effective in raising non-cognitive outcomes and, in turn, attainment. The primary outcomes were Key Stage 2 (KS2) maths and reading scores. The main secondary outcomes were motivation to learn and identification with school. Additional impact measures included: 'Self-esteem'; 'Goals and aspirations'; 'Problem-solving'; 'Fear of communication'; and 'Future life and aspirations'. The trial included 5,588 children from 165 schools. This programme was originally planned to run in 2020/2021 and 2021/2022 but it was delayed due to the Covid-19 pandemic. As a result, the programme delivery took place between January 2022 and July 2023 (which reduced overall programme delivery from six to five academic terms). A complementary implementation and process evaluation (IPE) explored how well schools were able to implement the programme, through surveys, interviews with CU Managers and school staff, pupil focus groups and analysis of activity data reported through the CUO platform.

Table 1: Key conclusions

Key conclusions
1. Volunteer pupils[1] in Children's University schools made the equivalent of one month's less progress in each of maths and reading, on average, compared to volunteer pupils in control group schools. Given the uncertainty in relation to the effects, the evaluator is unable to conclude that the effects are non-zero. These results have a high security rating.
2. There was no evidence to support that Children's University had an impact on Children's University volunteer pupils' motivation to learn in the classroom and their identification with school compared to their control group peers.
3. Free school meals (FSM)-eligible volunteer pupils in Children's University schools made the equivalent of zero month's progress in maths, on average, and the equivalent of one month's less progress in reading compared to volunteer FSM-eligible pupils in control group schools. Given the uncertainty in relation to these effects, the evaluator is unable to conclude that the effects are non-zero. These results may have lower security than the overall findings because of the smaller number of pupils.
4. Several key features in the logic model were not fully implemented as intended, in part related to ongoing disruption from the Covid-19 pandemic. There were fewer graduations overall, and fewer that took place in civic venues or universities than expected, a limited number of out-of-school validated local destination activities, and challenges with recording activities on CUO. Implementation was not sufficiently distinct from usual extracurricular activity reported by control schools and pupils.
5. Around three-quarters of the surveyed volunteer pupils in intervention schools were proud of what they had learned in their Children's University activities (CU activities) and reported benefits for their teamwork skills (three-quarters), sense of pride (two-thirds), and staying positive (two-thirds). CU Coordinators also perceived a positive impact on pupils' sense of achievement (just over half), although increased confidence and self-belief were noted by fewer than half.

[1] Children and parents expressed interest in participating in Children's University style activities before randomisation through forms and surveys, creating the eligible volunteer group for the trial.

EEF security rating

These findings have a high security rating. This was an effectiveness trial, which tested whether the intervention worked under everyday conditions in a large number of schools. This was a well-designed, two-armed, randomised controlled trial. The trial was well powered. Relatively few pupils (6%) who started the trial were not included in the final analysis. The lower levels of implementation fidelity, which meant there was insufficient distinction from usual extracurricular activities in control schools, make it harder to accurately estimate the size of the impact on the pupils in the trial hence, the loss of one padlock from the security rating.

Additional findings

Volunteer pupils in Children's University schools made, on average one month's less progress in maths than those in the control group equivalent. As with any study, there is always some uncertainty around the result: the possible impact of this programme for maths attainment also includes an effect of two months' less progress and an effect of up to one month's additional progress. Volunteer pupils in Children's University schools made, on average one month's less progress in reading than those in the control group equivalent. For reading, the possible impact of this programme also includes an effect of two months' less progress and an effect of zero month's progress. This means the evaluator cannot conclude that the effects are non-zero. These results have a high security rating. The results are perhaps unsurprising as the evaluation did not find evidence to support impact on the non-cognitive outcomes, which are posited by the logic model to lead to improved attainment.

Pupils took part in at least 34 hours of CU activities online on average, and 60% of pupils with records graduated with at least a Bronze award. However, the lower implementation fidelity including the limited graduations made the programme less distinct from usual extracurricular activities. Other challenges included somewhat limited additional support to specifically engage disadvantaged pupils and perceptions of limited parental engagement. The trial took place immediately after the Covid-19 pandemic when schools faced ongoing disruption and there was a necessary reduction of the programme from the usual six terms to five. All of these factors may have diluted the programme's potential for impact. Despite these issues, the majority of schools were satisfied with their overall experience of the programme (two-thirds), and pupils enjoyed the graduations where they took place.

Cost

The average cost to schools of Children's University was £1,139.40 per school. This works out at a cost of £25.90 per KS2 pupil per year averaged over three years, which is 'very low' as per the Education Endowment Foundation (EEF) cost rating. In addition to this, there is a cost of £5 per pupil for the Children's University passport.

Impact

Table 2: Summary of impact on primary outcomes

Outcome/ group	Effect size (95% confidence interval)	Estimated months' progress	EEF security rating	No of pupils (intervention; control)	Bonferroni corrected p-value	EEF cost rating
KS2 maths score	-0.05 (-0.15, 0.05)	-1		5,266 (2,605; 2,661)	0.731	£ £ £ £ £
KS2 reading score	-0.09 (-0.17, -0.01)	-1		5,250 (2,598; 2,652)	0.046	£ £ £ £ £

Introduction

Background

The Children's University Trust is a charity that works in partnership with schools to encourage children aged 5–14 years from all backgrounds to explore learning beyond the classroom and to develop a love for lifelong learning in them. The Children's University network is made up of over 60 delivery partners in the UK who work with local communities, local authorities, national partnerships, schools, and parents to deliver these opportunities to children. The Children's University programme aims to improve the aspirations and love of learning of pupils by encouraging participation in learning activities beyond the normal school day and to ultimately improve pupil attainment. Children's University centres support schools to provide a range of learning opportunities, such as after-school clubs, projects and enrichment activities, and visits to destinations such as libraries, sports clubs, historic centres, museums, or anywhere that offers structured learning activities for children. Pupils use a 'Passport to Learning' to record activities and hours, and these are rewarded by the collection of credits, certificates, and graduations. Participation in Children's University-validated activities is intended to impact on pupils' learning and attainment, and a range of wider non-attainment outcomes. It aims to give pupils the opportunity to develop character, self-esteem, resilience, motivation to learn, and life skills within and beyond the school curriculum, which are hypothesised to help improve pupil attainment in the longer term. More detail about the Children's University programme and how activities are recorded can be found in the 'Intervention ' section below.

An efficacy trial (2014–2017) of the Children's University programme was funded by the Education Endowment Foundation (EEF) to better understand the extent to which it is successful in these ambitions, as well as to assess the potential for the programme (and extracurricular participation more broadly) to positively influence academic attainment (Gorard *et al.*, 2017). This was based on several existing evidence reviews suggesting a potential association between participation in extracurricular activities and academic attainment including for disadvantaged pupils—albeit without any established causality (Cummings *et al.*, 2012; Tanner *et al.*, 2016). In the efficacy trial, potential impacts on non-cognitive outcomes were also explored, including teamwork, social responsibility, future aspirations, communication, empathy, self-confidence, resilience, and happiness.

Sixty-eight primary schools from the north of England took part in the efficacy trial. The trial involved pupils in Year 5 and Year 6. Year 6 pupils participated in the trial for one year, while Year 5 pupils were involved for two years. The evaluation assessed the impact of CU on pupils' reading and maths in Key Stage 2 (KS2) tests, and on non-cognitive outcomes such as 'teamwork' and 'social responsibility' measured through an attitude survey. Greater progress in both academic and non-cognitive outcomes was found among pupils in the intervention group compared to the control group. The gains (from Key Stage 1 [KS1] to KS2) were larger for the academic outcomes, equivalent to two months' additional progress in reading and maths, than for the non-cognitive items, which were small but positive. The trial had moderate security in the maths outcome and moderate-low security in the reading outcome. There was some imbalance between types of schools at randomisation where there were higher numbers of outstanding schools in the intervention group and the control group had more schools with higher proportions of pupils with free school meals (FSM) eligibility. In addition to this, the intervention group was ahead on most attainment and attitude measures at randomisation, which resulted in moderate and low to moderate security ratings. The evaluation team reported results as progress scores from KS1 to KS2, rather than a comparison of intervention and control groups at endpoint that is more usually found in the EEF's toolkit, and so the results of the efficacy trial may need to be interpreted with caution. Further analyses from the trial also suggested that all Year 5 pupils from the intervention group made better progress than control group pupils irrespective of their actual participation in Children's University activities. This adds further caution to the results as to impact being attributed to the Children's University programme itself.

This effectiveness trial was commissioned by the EEF to further develop their understanding of the potentially promising results from the efficacy trial and to see whether such impact could be maintained when delivered in more schools and at scale. It also sought to understand how (if at all) non-cognitive outcomes may act as a mediator for any impact on attainment that is observed—building on existing research that had found mixed results (e.g. see: Morris, 2016; Carolan, 2018).

Both the previous efficacy trial and the current effectiveness trial were particularly interested in the potential for the Children's University programme to increase extracurricular participation among disadvantaged pupils, where participation levels tend to be lower (Southby and South, 2016). Levels of extracurricular provision and access also vary considerably based on geographical differences such as urban/rural settings, as well as the type and size of the school (Power *et al.*, 2009). In the time preceding this trial, the government's plan for improving social mobility through education (DfE, 2017), the Essential Skills Programme in Opportunity Areas (2017–2019), and Hinds (2019) and the announcement of five foundations for building character and a new advisory panel on character and resilience, highlighted the importance of participation in extracurricular and character-building activities in policy agendas leading up to the Covid-19 pandemic. In particular, Hinds (2019; Secretary of State for Education, 8 January 2018 – 24 July 2019) pledged that the government would work with a wide range of organisations to 'help every child access activities within each of these five foundations' (Hinds, 2019). Hinds (2019) also relaunched the Department for Education (DfE) Character Awards, which recognise innovative programmes in schools. The Children's University intervention sits firmly within that policy context. More recently, schools and pupils have experienced significant disruptions relating to the Covid-19 pandemic. As a result, among other learning recovery strategies (e.g., literacy and numeracy), schools also prioritised wider activities to support pupil wellbeing due to increased anxiety and mental health issues (Nelson, Lynch and Sharp, 2021; Rose *et al.,* 2021) and to combat declining rates of attendance (DfE and Keegan, 2024). In addition to this, the cost-of-living crisis in the 2021/2022 academic year significantly affected schools in England. Rising prices, especially for energy and food, led schools to expand support for pupils, including providing subsidised meals and extracurricular activities as well as providing uniforms and clothing to pupils. Schools had to divert more resources to support students' welfare, while also dealing with post-pandemic recovery, demographic shifts, and teacher recruitment challenges (Lucas *et al.,* 2023).

Overview of the integrated evaluation design

An effectiveness trial to evaluate Children's University programme was scheduled to run during the academic years 2020/2021 and 2021/2022. Due to the Covid-19 pandemic, all schools in the UK were closed from 20 March 2020 to all pupils (except vulnerable children and the children of key workers). At this point, 107 schools had expressed interest in taking part in the trial and 15 schools had signed up to the trial. As a result of school closures, school recruitment was paused until September 2020. This is when most schools reopened to all/most year groups although still with several restrictions in place including staggered start and finish times, group bubbles, and further social distancing to limit interactions. The school recruitment resumed in October 2020 and completed in May 2021. In order to allow sufficient time for schools to be recruited, signed up, and completed baseline activities with parents and pupils, it was agreed between the National Foundation for Educational Research (NFER), the EEF, and the Children's University Trust that randomisation would take place in October 2021 (rather than in summer 2021), with the second half of the Autumn Term in 2021 for 'on-boarding'.[2] As a result, the intervention for pupils started in schools in January 2022 and activities ran until July 2023. This meant that the length of the intervention for pupils was reduced slightly from six academic terms to five academic terms. It was decided, in discussion with the Children's University Trust including reflection on the logic model, that a five-term intervention would not unduly affect the experience of pupils and the potential for outcomes to be achieved (see the trial protocol for further details in Bamford *et al.*, 2022). We know from other research that schools in England continued to face challenges relating to the pandemic: in spring 2022 schools reported high levels of staff absences and increased workload relating to pupil well-being and learning recovery, as well as some continued home learning (Wheater *et al*., 2022); and in spring 2023 schools were focusing on addressing challenges relating to pupils' behaviour and well-being (Rose *et al*., 2023). This trial is an effectiveness trial funded by the EEF to test how this intervention performs at scale over two years, and it adds to the existing evidence from the efficacy trial.[3] The evaluation is also one of the programmes under the DfE's Accelerator Fund, which is part of the government's investment in education recovery and is focused on literacy and numeracy programmes. It was included in the Accelerator Fund as the intervention had shown promising results in raising pupil attainment in an earlier evaluation. Part of the Accelerator Fund's focus was to further develop and strengthen the EEF's pipeline of programmes so that more evidence-based programmes with the potential to increase pupil attainment can be available to schools.

[2] Schools in England had several Covid-19 restrictions in place until March 2021, including periods of remote learning, reduced in-person attendance, and the implementation of safety measures. However, note that this was during the school recruitment period. No pupil data collection was yet underway. The period from June 2021 to October 2021 was indeed subject to further national and regional restrictions, but it relates to baseline pupil data collection and not the intervention delivery.

[3] Although the non-cognitive outcomes differed between the two trials, the efficacy trial placed greater emphasis on social action due to the funding requirements.

As a brief overview, we employed a school-randomised design, with 165 schools randomised on a 1:1 basis into two arms: intervention and control, stratified by Children's University areas (CU areas). The stratification aided intervention delivery such that each local Children's University delivery partner had an agreed number of intervention schools to support. Pupils volunteer themselves to take part in Children's University activities (CU activities) rather than the intervention being delivered to every pupil in a cohort. The opportunity to volunteer was therefore built into the trial design and offered to all pupils in the cohort. In order to identify such 'eligible volunteers' from all participating schools, children and parents expressed their interest in taking part in Children's University prior to randomisation. We did this via parent expression of interest (EOI) forms and pupil surveys at baseline. The group established this way became the eligible 'volunteers' to take part in the Children's University trial and in CU activities in schools allocated to the intervention group and constituted the analyses cohort.

The primary outcomes for this trial were KS2 maths and reading scaled scores accessed via the National Pupil Database (NPD). They were analysed as separate outcomes with a Bonferroni correction. We used standardised, validated age-appropriate measures to assess non-cognitive outcomes aligned with the logic model. These measures, included in pupil surveys at baseline and endpoint, were reliable as per the Statistical Analysis Plan (SAP) (Morton *et al.,* 2023). Two met the reliability threshold and were confirmed as secondary outcomes: 'Engagement' (motivation to learn); and 'Valuing of school' (positive identification with school). In addition to this, we explored intervention effects on 'Self-esteem', 'Goals and aspirations', 'Problem-solving', 'Fear of communication', and 'Future life and aspirations' (see the 'Outcome measures' subsection under 'Methods' section for further details). Compliance analysis used a measure that was created using the digital platform where children recorded their participation in Children's University activities—Children's University Online (CUO).

Other outcome areas in the logic model were explored in the implementation and process evaluation (IPE). The IPE supported the impact evaluation by exploring the number, range and types of activities that were offered across the 11 different CU areas (by schools and in the area) and taken up by the volunteers. The number of activity hours that children took part in also contributed to 'compliance 'analyses. The IPE complemented the impact evaluation by exploring implementation facilitators and barriers through both surveys and qualitative methods, drawing on reports from CU Managers, school staff and participating pupils. The IPE also explored any scaled-up implementation features in this effectiveness trial, and whether the different funding arrangements for local CU areas affected implementation. The IPE involved exploration of CUO activity data, in-person and telephone interviews with both CU Managers and school staff, pupil focus groups, a staff survey, usual practice surveys, and some IPE questions in the pupil survey.
Changes between the efficacy and the effectiveness trials are presented in Appendix C.

Intervention

Intervention name
Children's University (CU)

Why? (Theory and rationale)

Children's University is an intervention that works in partnership with schools and local activity providers to encourage, track and celebrate participation in extra-curricular learning activities both in and out-of-school beyond the normal school day. The programme is overseen by the Children's University Trust and managed on a local level by local CU areas and Managers.

As outlined in the previous section, there is evidence that extracurricular activities can positively impact on non-cognitive outcomes such as positive identification with school, improved self-confidence/self-belief, and increased motivation to learn. There is also some limited evidence of an impact on attainment. However, around 37% of young people do not take part in any extracurricular activities, and these mainly come from lower-income families (Cullinane and Montacute, 2017).

The Children's University Trust aims to create a level playing field of opportunity, and open access to extracurricular learning activities for children of all backgrounds, to broaden participation and access to all children, reduce differences in social and cultural capital, and to improve attainment in learning at school in the longer term.

Who? (Recipients)

The Children's University programme is available to pupils aged 5 to 14 years, with participating year groups selected according to the school and the local CU's situation and preference.

For this trial, the Children's University programme was made available to all Year 5 pupils in intervention schools who wished to participate. However, only those pupils who formally volunteered via parental EOI and a baseline pupil survey at the beginning of Year 5 were tracked for the trial. Participating pupils were in Year 6 for the second year of the trial.

The Children's University Trust and local CU Managers particularly encouraged schools in more deprived areas to take part in the trial. The intention was for schools and teachers to encourage pupils eligible for FSM and those who would not normally volunteer to take part in extracurricular activities to volunteer for the trial, although this does not appear to have been a common occurrence in practice (more detail on this in the 'IPE results' section).

What? (Materials)

The programme relies on pupils having access to a range of extracurricular activities offered by their school and/or by external providers (known as 'learning destinations') that they can participate in. Local CU areas also offer activities, both in-person and online and the Children's University Trust provides pupils with activities, which they can complete at home during school holidays. Activities must be validated by either the local CU Manager or school CU Coordinator for a pupil to record hours against it. Only activities that offer some kind of structured learning opportunity should be validated. CU-validated activities include 'Sports and physical' activities, 'Arts, culture, and music' activities, 'Environmental' activities, 'Practical life skills' activities, etc.

A paper-based 'Passport to Learning' is distributed to children (via schools) for recording their participation and collecting completed activity 'stamps'. Participating schools and children also register with a digital platform called Children's University Online (CUO) where they can add the 'stamps 'collected to their personal dashboard, allowing schools and local CUs to view all CU activity data in one place. Schools can access the platform to add extracurricular learning activities, which pupils complete in- and out-of-school, and downloadable holiday challenges are provided by the Children's University Trust. Children and families can access the 'Learning Activity' search facility through CUO to find CU-validated activities available in their local area. CUO was newly introduced at the time of the trial. The quality and completeness of the data it provided and the implications of this for the evaluation are discussed in this report under the 'IPE results' section.

Activity stamps are linked to a graduation system where children receive awards. Awards are given as the Children's University Trust certificates at annual graduation ceremonies. Children must complete a minimum of 30 hours of activity over the trial period[4] (five academic terms) to receive a Children's University award. Intervention schools receive the Children's University Trust Learning Destination plaque for public display.

What? (Procedures)

Local CU Managers support schools with set-up and preparation activities to encourage staff, pupils, and parent's engagement. While exactly how this is done depends on the local CU approach, for the purpose of the trial CU Managers were expected to provide separate information sessions for staff, pupils, and parents at the start of both the first and second years of the trial, with a particular focus on those pupils who had formally volunteered. Schools also received half-a-day's training on intervention management, monitoring, and delivery provided by local CU areas /Managers. In addition, the Children's University Trust provided schools with online training on using the CUO platform to validate activities and track pupil participation.

Local CU Managers continue to provide schools with ongoing support in relation to programme implementation. Local Managers source and validate (and in some cases, create) public learning activities and promote activities to schools and families. There is the intention that learning providers complete an online form to validate their learning activity. If

[4] N.B. There was an error in the protocol where compliance was described as a minimum of 30 hours of activities per year. The compliance measure was 30 hours of activities over a period of time, i.e. at the end of the trial for this study.

this meets the requirements of a structured learning activity,[5] this is approved by local CU areas/Managers and pupils can record their participation in the activity on CUO. The Children's University Trust also sources and validates activities from national providers.

Pupils who record at least 30 hours of extracurricular activities receive an award at a graduation ceremony run by their local CU area. The lowest award level is Bronze (30 hours), followed by Silver (65 hours), and Gold (100 hours). These are followed by certificates, diplomas, degrees, post-graduate awards and so on, up to a Gold Fellowship for recording 1,000 hours.

For the purpose of the trial, schools nominated a lead staff member who would also become the CU Coordinator to oversee programme implementation if their school was randomised to the intervention school group.

Who? (Providers)

The following stakeholders are involved in delivering the Children's University programme:

- the Children's University Trust;
- local Children's University teams (includes local CU Managers and Administrators who work within licensed managing organisations). Local CU teams are based in a range of organisations, including universities, schools, charities, and local authorities;
- in-school CU Coordinators (a member of school staff); and
- local and national learning providers, such as local clubs, libraries, museums, and national partners.

How? (Mode of delivery)

Participating children are encouraged to attend/complete a range of validated extracurricular activities, for which they receive a 'stamp' in their Children's University 'Passport to Learning'. One stamp generally equates to one hour of participation in a validated activity. Schools are encouraged to limit ten hours of Children's University stamps per single activity per term in an effort to motivate pupils to try new activities, but this was not obligatory within the context of the trial.

These 'stamps' are recorded on CUO. When activities are validated, they are tagged with relevant categories and skills with hours completed, as well as the range of activities engaged with and skills gained from participation, can be tracked. Schools and parents support pupils to keep their CUO profile up to date.

Each activity can be classified using up to four of the following categories:

- arts, culture, and music;
- careers and enterprise;
- citizenship;
- family learning;
- history and heritage;
- languages;
- literacy;
- mental health and well-being;
- nature and the environment;
- online;
- outdoor learning;
- practical life skills;
- science, technology, engineering, and maths (STEM);
- social and community action;
- sports and physical; and
- uniformed groups.

[5] At a minimum, learning destinations must indicate that the activity they run is voluntary, open to children within the 5–14 years age bracket, takes place beyond the core classroom environment and hours, takes place in an environment safe for children, can provide a key point of contact, and provides structured learning with clear learning outcomes and benefits for children.

For example, performative dance might be assigned the category 'Arts, culture, and music', as well as 'Sports and physical'.

Participating pupils receive awards at graduation ceremonies run by their local CU area. Graduation ceremonies were annual for the purpose of the trial.

Where? (Location)

Extracurricular activities may take place in-school beyond the school day (i.e. before school, at breaktimes, and after school) or out-of-school (also beyond the school day) for example, at local learning destinations (e.g. a library, dance studio). Activities can be in-person or online.

Pupils are supported to update CUO both during allocated class time and in their own time. In this trial, teachers and in some cases local CU Managers, also updated pupils' CUO dashboards.

Graduation ceremonies take place in local further/higher education institutions or civic buildings. However, contextual challenges (Covid-19, cost-of-living crisis) meant that, in this trial, many graduation ceremonies took place in schools instead.

When and how much? (Duration and dosage)

For the purpose of the trial, the Children's University programme was implemented for five academic terms over a two-year period (when the pupils were in Year 5 and Year 6) between January 2022 and July 2023.

Awards were given to pupils for a minimum of 30 hours participation.[6] (See 'What? (Procedures)' section above for further details about the award levels.)

Tailoring (adaptation)

The number, nature, and range of activities to which participating pupils have access depending on what is available at their school and local area, as well as their personal circumstances. Different local CU Managers also offer different activities developed specifically for their area.

How well planned?

The following strategies are put in place to support effective implementation of the Children's University programme:

- School senior leaders sign a Service Level Agreement with the local CU partner to demonstrate their commitment to the programme.
- A CU Coordinator is nominated by the school to oversee the programme and support participating pupils. Their role is to encourage variety and quantity of extracurricular provision and participation at the school, to encourage children to attend validated external activities and support them to keep their CUO profile up to date. They are also responsible for liaising with the local CU around graduation ceremony attendance.
- Local CUs provide school staff training and bespoke support as needed, both in-person and online. Local CUs also host information sessions to encourage staff, parents, and pupils buy-in. Throughout the implementation, they support schools to ensure CUO is kept up to date.

In an effort to achieve greater levels of standardisation across different local CUs, the trial introduced several conditions that would not necessarily be consistently seen outside of the trial, including implementation with a single cohort of pupils, mandatory use of CUO, and greater levels of the Children's University Trust involvement. Moreover, in practice, many of the features of the programme described above were adapted quite substantially in practice due to implementation challenges encountered including the challenging post-pandemic context and features of the programme itself (primarily the requirements of CUO). These modifications are explored in more detail under the 'IPE results' section in this report.

[6] Note: There was an error in the protocol where compliance was described as a minimum of 30 hours of activities per year. The compliance measure was 30 hours of activities over a period of time, i.e. at the end of the trial for this study.

Costs

Intervention group

Each intervention school was asked to contribute £300 in recognition of local management and passport costs for eligible volunteers included as part of delivery, with the exception of two areas where the funding arrangements with the local authorities were different: intervention schools that were part of the Wolverhampton and Westminster Children's University areas were not asked to pay a £300 contribution as the schools in these areas can access Children's University outside the trial free of cost.

Control group

Schools in the control group were not offered the Children's University programme during the trial (although it was acknowledged that individual pupils in these schools may participate in extracurricular activities that happen to be validated by the Children's University Trust, such as a local library reading challenge or a local gymnastics class). Control schools were required to complete two short surveys about their current practice in relation to extracurricular activities and allowed NFER's test administrators to visit their school to administer the follow-up pupil survey in Summer Term 2023. Schools in the control group were offered £500 compensation for their involvement in the trial, which was paid by the Children's University Trust at the end of the study after completing a current practice survey/proforma and the follow-up pupil survey.

Logic model

An initial logic model for the intervention was developed during the trial set-up stage between NFER, the Children's University Trust, and the EEF. Following a delay to the trial due to school closures as a result of Covid-19, a refresher Intervention Delivery and Evaluation Analysis (IDEA)[7] workshop was carried out in May 2021, and the logic model was revised in July 2021 to reflect small changes to the delivery of the programme (Figure 1) as described below.

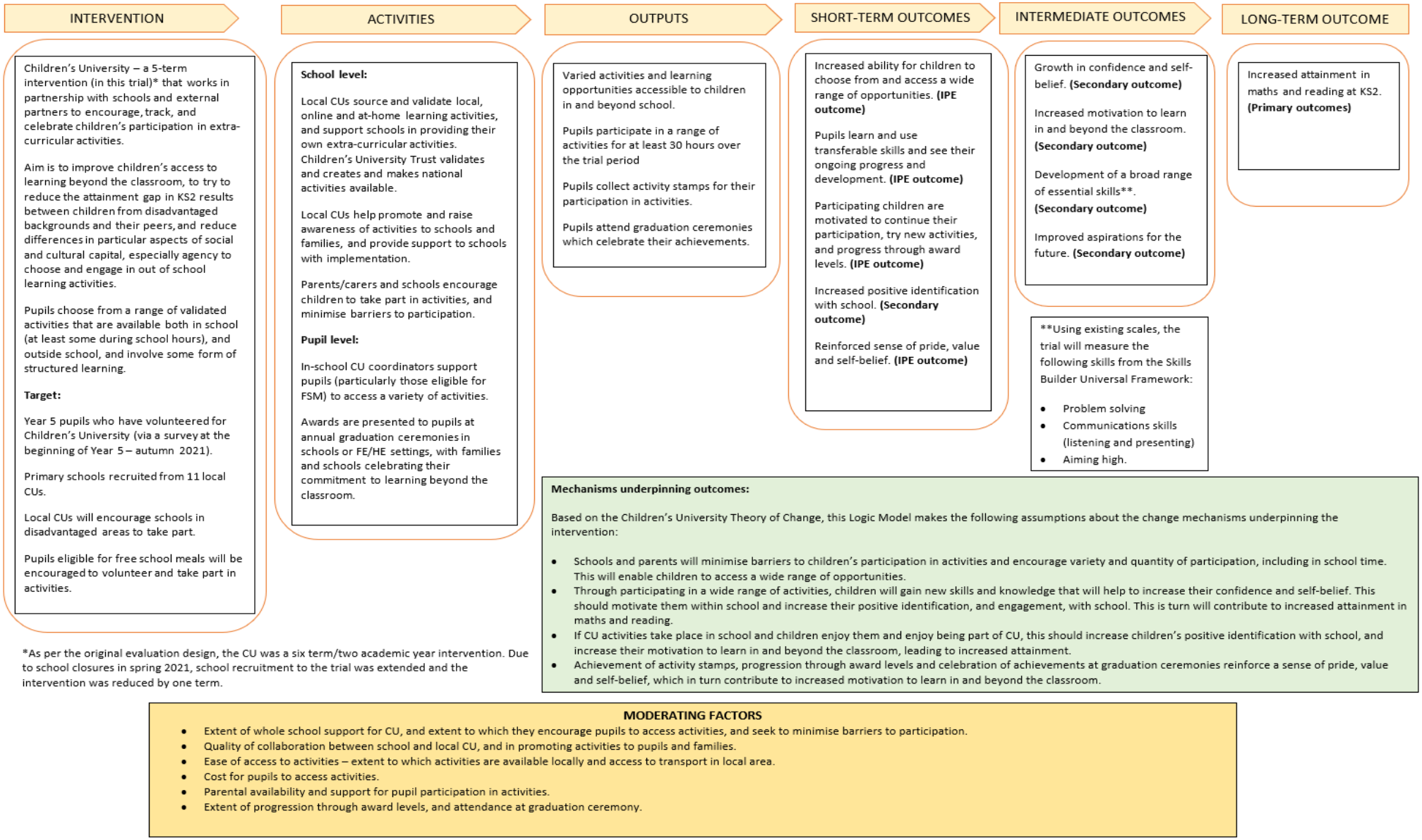
The implementation was amended to five academic terms rather than the six terms as per the original intended trial model and efficacy trial length. This differs from usual Children's University practice, for which schools' implementation of Children's University is ongoing. The shorter implementation window still allowed sufficient time (almost half a term, in autumn 2021) for on-boarding intervention schools. During this time, the Children's University Trust and local CUs worked with the intervention schools to ensure they were ready to deliver the programme in spring 2022 when schools reopened after Covid-19-related school closures. The on-boarding process included pupil assemblies, parent information sessions, and staff training. Due to the Covid-19 social distancing restrictions, some of this support was delivered remotely rather than in-school. Another change was in the range of validated activities. As a result of Covid-19, more at-home and online activities were made available to children and these continued to be available throughout the intervention. It was intended that graduations would still be held in local universities or civic buildings, but acknowledging the Covid-19 restrictions during the refresher IDEA workshop, there was the minimum expectation that these would take place in schools instead.

The logic model describes the intervention activities, and illustrates the hypothesised causal mechanisms underpinning the intervention, and the anticipated short-term, intermediate, and longer-term outcomes. The model describes how, by raising schools' and families' awareness of CU activities, and minimising barriers to participation (intervention inputs/activities), children are more likely to take part in CU extracurricular activities (outputs). Children will be encouraged to participate in more activities (including new ones) and progress through award levels (intervention inputs/activities/outputs). Through participating in a wide range of activities that involve some kind of structured learning, children will gain new skills, knowledge, and motivations (short-term outcomes), which will help to increase their self-confidence/self-belief, positive identification with school, motivation to learn in and beyond school, and widen future aspirations (short-term and intermediate outcomes). They will also develop a broad range of essential skills including problem-solving and communication skills.[8] Participation in Children's University and commitment to learning beyond the classroom will be further celebrated by their family, school, and community through an annual graduation ceremony, and it is expected that this will reinforce a sense of pride and self-belief among pupils (i.e. reinforcing these short-term and intermediate outcomes). In addition, by highlighting to pupils that 'learning' does not simply occur in a classroom (for example) the programme seeks to effect a positive change on pupils' views of learning. It is expected that these positive non-cognitive outcomes and attitude changes will lead to increased attainment in maths and reading at KS2, through a combination of increased confidence and self-belief that they *can* do better, higher aspirations, and motivation to learn both in and beyond school. This builds on several existing evidence reviews that had found mixed results and suggest a potential association between participation in extracurricular activities and academic attainment (Cummings *et al.,* 2012; Tanner *et al.,* 2016; Morris, 2016; Carolan, 2018).

The inputs required for the intervention, and the causal mechanisms underpinning the outcomes, are also illustrated in the Children's University Trust Theory of Change diagram in Appendix E. Note that the Theory of Change is included for reference only, the evaluation focuses on the logic model only.

[7] The IDEA workshop focused on exploring the causal mechanisms behind developing and refining the logic model during the evaluation.
[8] The Children's University Trust refers to the Skills Builder Partnership (2020), which is a framework to define and measure essential skills.

Figure 1: Logic model for the trial (developed collaboratively by NFER and the Children's University Trust)



Evaluation objectives

The aim of the evaluation was to assess whether Children's University is effective in raising attainment and non-cognitive outcomes at scale over two academic years (see 'Outcome measures' subsection under 'Methods' section below) when comparing pupils in intervention and control group schools. A full evaluation protocol can be found on the EEF's website (Bamford *et al.*, 2022).

The primary research questions for this trial were:

1. What is the impact of Children's University on pupils' maths attainment as measured by KS2 scaled scores?
2. What is the impact of Children's University on pupils' reading attainment as measured by KS2 scaled scores?

These were answered as two separate research questions and as per the EEF guidance, they were corrected for multiple testing. In the SAP (Morton *et al.,* 2023), we had proposed to use the Romano-Wolf correction to account for multiple testing instead of the Bonferroni correction that was proposed in the protocol. However, due to the technical difficulties in running Romano-Wolf correction, we reverted to using Bonferroni correction. Please see the 'Methods' section for further details.

Secondary research questions for this trial were based on key constructs in the logic model for CU relating to short-term and intermediate outcomes: growth in pupils 'confidence and self-esteem; improved goals and aspirations; increased motivation to learn; and increased positive identification with school (see Figure 1). These outcomes were measured using existing reliable scales with published psychometric properties in a bespoke age-appropriate pupil survey. Confidence and self-esteem was measured by the 'Self-esteem' subscale from the Student Resilience Survey (SRS) (CORC, n.d.); improved goals and aspirations was measured by the 'Goals and aspirations' subscale from the SRS (CORC, n.d.); increased motivation to learn was measured by the 'Engagement scale' from the Panorama Social-Emotional Learning (SEL) measure (Panorama Education, n.d.); and increased positive identification with school was measured by the 'Valuing of school' scale from the Panorama SEL measure (Panorama Education, n.d.).

The secondary research questions for this trial were:

3. What is the impact of Children's University on pupils' self-esteem as measured by the 'Self-esteem' subscale (CORC, n.d.) in a pupil survey?
4. What is the impact of Children's University on pupils' goals and aspirations as measured by the 'Goals and aspirations' subscale (CORC, n.d.) in a pupil survey?
5. What is the impact of Children's University on pupils' engagement as measured by the 'Engagement scale' (Panorama Education, n.d.) in a pupil survey?
6. What is the impact of Children's University on pupils' valuing of school as measured by the 'Valuing of school' scale (Panorama Education, n.d.) in a pupil survey?

As described in the SAP (Morton *et al.,* 2023), only those demonstrating a Cronbach's alpha value of 0.7 or above in the baseline pupil data would be included in the secondary outcome analysis. Subscales 'Self-esteem' and 'Goals and aspirations' did not reach this threshold at baseline; hence research questions 3 and 4 were analysed as exploratory rather than secondary research questions. Further details are presented in the 'Outcome measures' section.

In addition to the above outcomes, we also assessed pupils' essential skills using items from existing established scales, which were included in the pupil survey. Perceptions of their problem-solving skills were measured using the 'Problem-solving' scale from the SRS (CORC, n.d.) and pupils' self-reported confidence to communicate was measured by the 'Personal Report of Communication Fear (PRCF)' scale (McCroskey *et al.*, 1981) and pupils' 'Future life and aspirations' was measured by future life questions from the Children's Society Household Panel 2019 (The Children's Society, 2019). Even though these are established scales, the measures were pupils' own perceptions about these skills rather than assessment of skills themselves. Hence, the analyses were exploratory in nature.

The accompanying IPE investigated the following research questions:

- IPE_RQ1: To what extent was the programme implemented as intended? In particular:

- Were the training sessions, information sessions, validation of activities, access to passports and CUO, and graduations implemented as intended?
- What range of validated CU activities were offered—by schools? In the locality? What activities were most common; and what variations were there between local CU areas? Were any new activities offered/validated, and why?

- IPE_RQ2: What was the extent of pupil participation? Which types of activities did children take part in and how often? How many children graduated? And which children?
- IPE_RQ3: What are the facilitators to implementation (including local CU support to schools, validation support, local offer, use of CUO, graduation support, school promotion of activities, school support to pupils, parental support, funding arrangements)? What are the barriers/challenges? Were there any adaptations and why? In particular:
  - To what extent was the programme well supported—by local CUs, by schools, by parents? To what extent did schools and parents engage with Children's University?
  - How were children from disadvantaged backgrounds encouraged and enabled to take part?
  - To what extent were any differences in the funding arrangements facilitators/barriers to implementation (including schools' engagement and fidelity)?
  - Were there any barriers to implementation? Any support challenges? Were there any adaptations and why?
- IPE_RQ4: What are the facilitators and barriers to delivering at scale (e.g. centralised support to local CUs)? How effective are these facilitators felt to be? What are the implications for further scaling?
- IPE_RQ5: How well do participants feel the intended outcomes are being achieved for children (learning outcomes, personal, social, and future aspiration outcomes, with a focus on outcomes not being explored through the secondary outcomes survey)?
- IPE_RQ6: What happened in the control group? What was business as usual? And what extracurricular participation is usual for pupils in the intervention and control groups?

Ethics and trial registration

The evaluation was conducted in accordance with NFER's Code of Practice (available at: http://nfernet.nfer.ac.uk/media/3029/code_of_practice_final_march_2019.pdf). NFER, the Children's University Trust, and the EEF worked together to ensure each organisation's policies could be applied in practice.

School headteachers or senior leaders signed a Memorandum of Understanding (MoU) (Appendix F), which formed part of the ethical agreement for a school to take part in the trial. Before requesting schools to share their pupil data, we asked the schools to distribute a parent information sheet and parent withdrawal forms. This enabled parents to withdraw their child from the data processing for the trial. Schools did not share pupil data for the children whose parents withdrew them at this stage. Prior to randomisation, parents also received an EOI where they had an opportunity to volunteer their child to take part in CU activities if their school was randomised to intervention. The EOI offered an opportunity to parents to discuss volunteering with their child before the child volunteered themselves to CU activities via a pupil baseline survey. The parent EOI formed part of ethical consideration for parents to express willingness or the ability to support their child to take part in a range of activities. For further details on volunteering, please see 'Pupil eligibility' section.

The trial was designed, conducted, and reported to CONSORT (CONsolidated Standards Of Reporting Trials) standards: http://www.consort-statement.org/consort.statement/. It is also registered on the International Standard Randomised Controlled Trial Number (ISRCTN) Registry: https://www.isrctn.com/ISRCTN94746973.

Data protection

NFER and the Children's University Trust were joint data controllers for this trial. The local Children's University centres were the data processors on behalf of the Children's University Trust.

The legal basis for processing personal data was covered by General Data Protection Regulation (GDPR) Article 6 (1) (f), which states that 'processing is necessary for the purposes of the legitimate interests pursued by the controller or by a third party except where such interests are overridden by the interests or fundamental rights and freedoms of the data subject which require protection of the personal data'. In addition, we carried out a legitimate interest assessment, which demonstrated that the evaluation fulfilled one of NFER's core business purposes (undertaking research, evaluation, and information activities) and it has broader societal benefits. Therefore, it was in our legitimate interest to process and analyse personal data for the administration of this randomised controlled trial.

NFER, the Children's University Trust, and the EEF signed a Data Sharing Agreement that set out the roles and responsibilities for this trial. This included a description of the nature of the data being collected and how it would be shared, stored, protected, and reported by each party. In addition, the Children's University Trust provided an MoU to schools, explaining the nature of the data being requested of schools, teachers, and pupils, how it would be collected, and how it would be passed to and shared with NFER. Two separate Privacy Notices were available: one for local CUs and schools (see Appendix G); and another for parents (see Appendix H).

For the purposes of the trial, the Children's University Trust (via their local CUs) collected names, roles, and contact details, of a key contact person at school when they were recruited. They shared this data with NFER using NFER's secure data portal. In Summer Term 2021, NFER contacted participating schools asking them to distribute parent information letters and withdrawal forms to parents of all Year 4 pupils. The schools provided pupil data to NFER via a secure online portal. This included pupil names, date of birth, unique pupil numbers (UPNs) for all Year 4 pupils (enrolled in 2020/2021), and where parents had not withdrawn their child from data collection. NFER used this information to match individual baseline pupil survey responses with a parent EOI form to determine the Children's University volunteers for the trial.

After randomisation, NFER shared the above pupil information (pupil names, date of birth, NFER pupil identification [ID], UPN, and whether a child is a volunteer or not) as well as schools' details for the intervention schools with the Children's University Trust. This enabled the Children's University Trust to create school and individual child logins for each child taking part in Children's University on the CUO platform. This also enabled the local CUs to issue access to the CUO platform to each volunteer. Pupils (and parents) in the intervention group used the CUO platform to log CU activities they took part in. The online data also enabled the Children's University Trust and their local CUs to track participation of each intervention child in CU activities.

The Children's University Trust shared with NFER, the CUO participation data for all intervention pupils who volunteered to take part in CU activities. This included UPN, NFER pupil ID, school details, number and type of CU activities taken part in and hours spent for each activity; whether pupils received certificates or awards. The date that each hour of CU activities was logged was also included.

To obtain the information from the NPD, NFER provided names of the pupils, their dates of birth, school unique reference number, and UPNs to DfE's data sharing team. The DfE team transferred de-identified pupil data to a designated project space on the Office for National Statistics (ONS) Secure Research Service platform. This included Pupil Match Reference, FSM eligibility, KS1, and KS2 attainment variables from the NPD along with NFER pupil ID. It was this pupil ID that enabled NFER to match NPD data with the relevant evaluation data for each pupil.

NFER visited schools as part of the process evaluation to observe and interview key staff members and pupils. All staff visiting schools had up-to-date Disclosure and Barring Service (DBS) checks. All data gathered during interviews were stored securely. No names of individuals were used in any report arising from this work.

Within three months of the publication of this report, NFER will upload pseudonymised school and pupil data to the EEF's data archive partner. This will include school names, ID, and intervention group variables, pupil data from CUO platform, pupil data from NPD, and secondary outcomes data from the pupil survey. At this point, the EEF's data archive partner will keep a copy of the data and the EEF will become the data controller. Other research teams can request to

access this data from the EEF's data archive (see their privacy notice **here**). Further matching to NPD and other administrative data may take place during subsequent research.

All data gathered during the trial was held in accordance with the data protection framework created by the Data Protection Act 2018 and the GDPR 2016/679, and was treated in the strictest confidence by NFER, the Children's University Trust, and the EEF.

NFER and the Children's University Trust will retain personal data for one year after the report is published in case there are any queries about the report. One year after the report publication, all personal data will be securely deleted.

Project team

The NFER was the independent evaluator for this trial. Pippa Lord (Trials Director, NFER Education Trials Unit) was the trial director and the principal investigator with a strategic oversight of the trial. The trial was led and managed by Palak Roy (Senior Trials Manager in the NFER's Education Trials Unit). The IPE was initially led by Lisa O'Donnell (NFER Research Associate) and then by Kelly Kettlewell (NFER Research Associate). Lillian Flemons (Research Manager) assumed this role after them. Eleanor Bradley (Researcher) was the IPE researcher. Chris Morton (Senior Statistician) and Afrah Dirie (in her former role as a Senior Statistician at NFER) were the trial statisticians. Lisa Kuhn from NFER's Centre for Assessment helped with the validated scales used in pupil surveys. Vrinder Atwal provided administrative assistance throughout the evaluation. They were supported by the research operations team at NFER for the collection of evaluation data and liaising with participants. The NFER operations team included: Kathryn Hurd; Kathryn Gallop; Guido Miani; Priscilla Antwi; and Katharine Stoodley.

The Children's University programme was overseen by a central team at the Children's University Trust: Helen O'Donnell; Sonjia Peers; Liam Nolan; and Sukie Duhra.

The project was supported and guided by the EEF staff: Dr Marta Moratti; Dr Rachel Morris; Jamila Boughelaf; Celeste Cheung; Dr Florentina Taylor; and Amy Clark.

Methods

Trial design

This was an effectiveness trial, which adopted a cluster randomised controlled trial design. A total of 165 schools were randomly assigned to either intervention (receive the Children's University programme) or control (to continue usual practice). Randomisation was stratified by 11 CU areas. All schools had a 50:50 chance of being assigned to the intervention group within each geographical cluster (see the 'Randomisation' section for further details). The intention for stratifying by area was to aid delivery of the intervention, ensuring that each local CU Manager supported half the number of schools recruited to the trial in their local area.

Intervention schools received the Children's University programme for five academic terms. Control group schools could not access the programme during the trial. There were 82 intervention schools and 83 control groups schools. Schools from the intervention group were asked to make a £300 contribution to the Children's University Trust to take part in its activities for two academic years. The only exceptions to this requirement were the intervention schools in Wolverhampton Children's University and Westminster Children's University areas as the schools in these areas could access Children's University outside the trial free of cost. Control schools were not able to access Children's University for the duration of the trial. Control schools received £500 financial incentive upon completion of endline trial activities.

The primary outcomes for this trial were KS2 maths and reading scaled scores accessed via the NPD. They were analysed as separate outcomes with a Bonferroni correction. We used existing age-appropriate measures in a bespoke pupil survey to assess non-cognitive secondary outcomes aligned with the logic model. The secondary outcomes were 'Engagement' and 'Valuing of school'. A summary of the design can be found in Table 3.

Table 3: Trial design

Trial design, including number of arms		Two-arm, cluster randomised controlled trial
Unit of randomisation		School
Stratification variable(s) (if applicable)		Children's University localities
Primary outcome	Variable	1. Maths attainment 2. Reading attainment
	Measure (instrument, scale, source)	1. KS2_MATSCORE, 0–999, NPD 2022/2023 KS2 attainment data 2. KS2_READSCORE, 0–999, NPD 2022/2023 KS2 attainment data
Secondary outcome(s)	Variable(s)	1. Engagement 2. Valuing of school
	Measure(s) (instrument, scale, source)	NFER survey administered at follow-up that includes the following established scales: 1. 'Engagement' scale from Panorama SEL survey, 5–25, (Panorama Education, n.d.) 2. 'Valuing of school' scale from Panorama SEL survey, 4–20, (Panorama Education, n.d.)
Baseline for primary outcome	Variable	1. Maths attainment 2. Reading attainment
	Measure (instrument, scale, source)	1. Whether working at or above expected standard for KS1_MATH_OUTCOME, categorical, NPD 2018/2019 KS1 attainment data 2. Whether working at or above expected standard for KS1_READ_OUTCOME, categorical, NPD 2018/2019 KS1 attainment data

Baseline for secondary outcome(s)	Variable(s)	1. Engagement 2. Valuing of school
	Measure (instrument, scale, source)	NFER survey administered at baseline that includes the following established scales: 1. 'Engagement' scale from Panorama SEL survey, 5–25, (Panorama Education, n.d.) 2. 'Valuing of school' scale from Panorama SEL survey, 4–20, (Panorama Education, n.d.)

Participant selection

School eligibility

State-funded maintained primary schools selected from the Children's University Trust localities were eligible to take part. These were: Bexley; Cheshire; Cornwall and Devon; East London; Essex and Suffolk; Lancashire; Merseyside; Peterborough; Rotherham; Wakefield; Warrington; Westminster; Wirral; and Wolverhampton. If schools offered Children's University at the time of recruitment or anytime in the last three years, they were not eligible to take part.

Pupil eligibility

Pupils volunteer themselves to take part in Children's University activities rather than the programme being delivered to every pupil in a cohort. Therefore, the opportunity to volunteer was built into the trial design and was offered to all pupils in the cohort. In order for us to identify such 'eligible volunteers' from all participating schools, we asked children and parents to express their interest in taking part in Children's University prior to randomisation.

All Year 4 pupils in the academic year 2020-21 in participating schools were eligible to take part in the trial. Once the schools were recruited to the trial, they shared pupil data with us. This included all of their Year 4 pupils except those whose parents had withdrawn them from the data sharing. We asked schools to distribute the parent EOI forms. These forms included brief information about the Children's University Trust, and the types of Children's University activities offered in and outside school and the caveat that their child would only be able to access these activities if their school was randomly allocated to the intervention group; and they would need to arrange for transport if they wished their child to attend activities outside the school. NFER also sent guidance to teachers for them to encourage parents and pupils to discuss the opportunity to participate in these activities with the children. After a week or so, we asked schools to complete pupil surveys. In addition to measuring the secondary outcomes, the pupil surveys at baseline also asked children to indicate whether they would like to take part in extracurricular activities such as the ones offered by Children's University. Responses from parent EOIs and pupil surveys determined eligible volunteers. This took place before randomisation to ensure that we had identified the control group pupils who would have volunteered to take part in the Children's University programme had they been randomly allocated to receive the programme.

A child was considered an eligible volunteer if the parent and child both expressed interests to take part in extracurricular activities. The child was also considered a volunteer if they expressed an interest in extracurricular activities, but their parent did not respond to the EOI form and similarly, the child was considered a volunteer if they did not respond to the volunteering question in the baseline survey but their parents expressed an interest for them to take part in extracurricular activities.

Recruitment

Recruitment was led by the central team at the Children's University Trust. School recruitment began in October 2019 but it had to pause in March 2020 due to Covid-19 school closures. At this point, 107 schools had expressed interest in taking part in the trial and 15 schools had signed up to the trial. As a result of school closures, the evaluation activities including school recruitment were paused until September 2020 while schools continued with periods of partial school closures due to Covid-19. This was a challenging period for schools and there was uncertainty in terms of the number of schools that we would be able to retain in the study. Therefore, when recruitment resumed in October 2020, it was decided that 200 schools would need to be recruited to mitigate the potential attrition at each stage as the ongoing disruption from the pandemic posed many challenging circumstances for schools to continue to participate in research. This target was with an assumption that at least 150 schools would be retained in the trial at randomisation. Overall, the recruitment for this trial was quite successful. The Children's University Trust had signed up 208 schools by May 2021

and 165 were put forward for randomisation. Please see the 'Participant flow including losses and exclusions' subsection under 'Impact evaluation results' section for further details.

For recruitment for this trial, the Children's University Trust used open datasets (found online) to email eligible schools within the targeted areas. Schools were also informed of the trial via the EEF newsletter. Schools within the target areas of 11 local CU areas were considered. These CU areas were selected if they were well established, sustainable, and saw benefit from being engaged in this form of evaluation. They were contacted up to three times to remind them of the opportunity to sign up to the trial. In addition to this, there were also the EEF newsletters. Schools that expressed interest were invited to a Zoom call presentation that went through the Children's University programme as well as the evaluation activities of the trial. After the Zoom call, schools were sent an MoU to sign and return. If schools did not return the MoU after this, they were sent a reminder.

Outcome measures

Primary outcome

As per the logic model (Figure 1), the primary outcome for this trial was pupil attainment. Since the efficacy trial indicated potentially promising results for both reading and maths, the impact of Children's University programme in this effectiveness trial was also measured using two separate outcomes—maths and reading at KS2. The maths attainment primary outcome was measured using scaled maths scores from national curriculum assessments taken at the end of KS2. These ranged between 80 and 120 and were obtained via the 'KS2_MATSCORE' variable in the NPD. Similarly, the reading attainment was measured based on scaled reading scores in the 80–120 range and using the 'KS2_READSCORE' variable in the NPD.

Secondary outcomes

Secondary outcomes were collected via a pupil survey created by NFER. This survey development was essential due to the lack of an existing tool that effectively measured pupils' non-cognitive outcomes in line with the programme's logic model. This survey included selected standardised scales and questions about extracurricular activities and was piloted by NFER researchers in 2020. Cognitive interviews with 21 children in two primary schools ensured clarity and accessibility of the survey in the trial, leading to small amendments such as rewording items and labelling response categories (see the trial protocol for further details in Bamford et al., 2022). Trial pupils completed the survey at baseline (prior to randomisation) in autumn 2021 and answered the same questions at follow-up in summer 2023. In the protocol, we proposed four potential secondary outcome measures, each of which aligned with short-term and intermediate outcomes in the logic model. 'Engagement' measured motivation to learn in the classroom, 'Valuing of school' measured positive identification with school, 'Self-esteem' measured confidence and self-belief, and 'Goals and aspirations ' measured aspirations for the future. Only two of these outcome measures ('Engagement' and 'Valuing of school') met the criterion of having a Cronbach's alpha value of 0.7 or higher in the baseline pupil data hence, these were included as the secondary outcomes. The other outcomes were considered as exploratory outcomes (see the following section). To add further confidence in the measures, in addition to Cronbach's alpha, a confirmatory factor analysis was also performed for 'Engagement' and 'Valuing of school' scales to examine the relationship between observed variables and latent constructs. This was done in R using the package 'lavaan' (Rosseel, 2012). Results from the factor analysis overall supported the use of these measures. Please see further details in the SAP. (Morton *et al.*, 2023).

To measure the 'Engagement' and 'Valuing of school' outcomes, the Panorama SEL survey (Panorama Education, n.d.) was used. A section of the SEL survey focuses on the pupil's learning environment and the degree to which this influences their academic success and social-emotional development, which is broken down into ten subscales. The 'Engagement' subscale consists of 5 Likert-type items, which can be rated between 1 and 5. The Likert-type scale labels vary from item to item, but higher numbers are positive. Summing these item scores produce an outcome measure in the range of 5 to 25, where higher values indicate greater engagement with school classes. Another subscale of the Panorama SEL survey is 'Valuing of school': the degree to which pupils feel that school is interesting and important to them. The subscale consists of 4 Likert-type items, rated between 1 and 5, where higher ratings are positive. All secondary outcomes were obtained by summing their constituent items. If some items were missing from a measure, then the total score for that measure were treated as missing (consistent with the complete-case analysis used in the secondary analysis models). The overall score for the subscale ranges between 4 and 20, with higher values indicating a greater value placed on schooling. Details of the measures and their constituent items can be found in Table 4 below.

Table 4: Properties of secondary outcome measures

Measure (min-max value)	Constituent items	Response categories (scores)	Cronbach's alpha
'Engagement' (5–25) (Panorama Education, n.d.)	In general, how excited are you about going to your lessons?	Not at all excited, Slightly excited, Somewhat excited, Quite excited, Extremely excited (1–5)	0.77
	How focused are you on the activities in your lessons?	Not at all focused, Slightly focused, Somewhat focused, Quite focused, Extremely focused (1–5)	
	In your classes, how excited are you to join in?	Not at all excited, Slightly excited, Somewhat excited, Quite excited, Extremely excited (1–5)	
	When you are not in school, how often do you talk about ideas from your lessons?	Almost never, Once in a while, Sometimes, Frequently, Almost always (1–5)	
	How interested are you in your lessons?	Not at all interested, Slightly interested, Somewhat interested, Quite interested, Extremely interested (1–5)	
'Valuing of school' (4–20) (Panorama Education, n.d.)	How interesting do you find the things you learn in your lessons?	Not at all interesting, Slightly interesting, Somewhat interesting, Quite interesting, Extremely interesting (1–5)	0.70
	How often do you use ideas from school in your everyday life?	Almost never, Once in a while, Sometimes, Frequently, Almost always (1–5)	
	How important is it to you to do well in your lessons?	Not at all, A little bit, Somewhat, Quite a bit, A tremendous amount (1–5)	
	How useful do you think school will be to you in the future?	Not at all useful, Slightly useful, Somewhat useful, Quite useful, Extremely useful (1–5)	

Baseline for primary outcomes

Each primary outcome had a corresponding baseline measure—KS1 maths and KS1 reading. KS1 maths was measured by 'KS1_MATH_OUTCOME' variable from the NPD, which were treated as a categorical variable with four levels: 'below expected standard' (NPD codes 'BLW', 'PK1', 'PK2, 'PK3', and 'PK4', 'working towards expected standard' (code 'WTS'), 'at expected standard' (code 'EXS') and 'above expected standard' (code 'GDS'). This was modelled in regressions with 'below expected standard' as the reference level and three indicator variables for the remaining levels. Codes indicating no result (codes 'A', 'D', and 'Q') were treated as missing data.

Baseline for secondary outcomes

The baseline measures for secondary outcomes ('Engagement' and 'Valuing of school') used the same scales as the outcome measures. The baselines were obtained by summing their constituent items in the baseline pupil surveys prior to randomisation.

Exploratory outcomes

'Self-esteem' and 'Goals and aspirations' had lower reliability (<0.7 Cronbach's alpha) at baseline and hence, in line with the SAP, were not considered for secondary analyses. These outcomes, along with the other two additional pre-designated exploratory outcomes, 'Problem-solving' and 'Fear of communication', were considered for exploratory

analyses. Even though 'Problem-solving' and 'Fear of communication' are established scales, the measures were pupils' own perceptions about these skills rather than assessment of skills themselves. Hence, these were described as exploratory outcomes while writing the protocol irrespective of their reliability. Further details about each outcome are summarised below and the properties are presented in Appendix I.

Self-esteem

The self-esteem of pupils was measured via three items, which comprise the 'Self-esteem' subscale of the SRS (Sun and Stewart, 2007). The SRS is a 47-item measure, consisting of 12 subscales that quantify child resilience and protective factors in their family, school, and community. For each item of the 'Self-esteem' subscale, pupils indicate the frequency of positive occurrences (e.g. 'I can work out my problems') with a rating between 1 (never) and 5 (always). The sum of these ratings forms an outcome with a range from 3–15, where higher scores indicate higher self-esteem.

Goals and aspirations

The ability of pupils to form goals and aspire towards a successful future was measured via two items, which form the 'Goals and aspirations' subscale of the SRS. These items again relate to positive occurrences ('I have goals and plans for future' and 'I think I will be successful when I grow up'), which are rated between 1 (never) and 5 (always). The resulting outcome therefore, takes a value between 2 and 10, where higher ratings are considered positive.

Problem-solving

Pupils' perception of their ability to work through their problems with the support of others was measured via three items, which form the 'Problem-solving' subscale of the SRS. These items relate to positive attitudes (e.g. 'I try to work out problems by talking about them'), which are rated between 1 (never) and 5 (always). The resulting outcome therefore, takes a value between 3 and 15, where higher ratings consider that the pupil is more able to utilise the support of others to help solve their problems.

Fear of communication

The PRCF scale concerns feelings about communicating with other people (McCroskey *et al.*, 1981). Eight of the 14 items from this scale are used to measure fear of communication in this trial. Both positively and negatively worded statements are included in these items, which are rated between 1 (strongly disagree) and 5 (strongly agree). This reverses the original instrument (where 1 was 'strongly agree', and so on), allowing higher scores to be positive, in line with other outcomes in this trial. Negatively worded items are reverse-scored, so that the overall total of the items take a value between 8 and 40, with higher values indicating less fear of communication.

Sample size

Sample size at protocol

For the sample size calculations at the protocol stage, the target number of schools in each arm of the trial was 75 (see Table 9). Correlation between KS1 and KS2 variables was assumed to be 0.65 and intracluster correlation coefficient (ICC) was assumed to be 0.18, both of which were based on our review of the EEF-funded studies. We assumed a cohort size of approximately 20 pupils per school would volunteer to take part in CU activities. This was based on the efficacy trial where, on average, 29 pupils per school volunteered. Due to the refined volunteering process for this trial, a lower average was assumed. A Bonferroni-adjusted alpha value was used at all stages of the minimum detectable effect size (MDES) calculations: the usual value of 0.05 was halved, as there were two study outcomes. The Romano-Wolf multiple testing correction proposed in the SAP was not used in the analysis or MDES calculations, as explained under the 'Correction for multiple testing' subsection under 'Statistical analysis' section below. With these parameters specified, an MDES of 0.19 was achievable with a power of 0.8.

MDES at randomisation

At the randomisation stage the number of volunteered pupils (n=5,588 total, 34 per school) and schools (n=164) in the MDES calculation were updated to reflect the numbers randomised, which were higher than expected at the protocol

stage,[9] leading to a lower MDES of 0.17. Assumptions about the ICC and pre-test/post-test correlation were carried forward from the protocol stage.

MDES at analysis

At the analysis stage the number of pupils dropped due to missing data (n=5,266 for maths outcome, n=5,250 for reading outcome) and the number of schools remained the same as at randomisation (n=164). ICCs were updated using the trial data itself (0.16 for maths outcome, 0.08 for reading outcome). As KS1 maths and reading variables were categorical, it was not possible to calculate a pre-/post-test Pearson correlation. Instead, the proportionate reduction in unexplained variance going from an empty model to the primary analysis models was calculated (i.e. similar to R^2 in ordinary least squares [OLS] linear regression). The square root of this number was used from the data in place of pre-/post-test correlations at the analysis stage (0.68 for maths outcome, 0.64 for reading outcome). These updated ICC and pre-/post-test correlations resulted in a further reduced MDES of 0.15 (maths outcome) and 0.12 (reading outcome), as shown in the 'Impact evaluation results' section.

The proportion of FSM pupils was estimated at 15.7%[10] of volunteers at the protocol and randomisation stages, then based on the actual observed proportion of FSM-eligible pupils (30.0%) at the analysis stage. Also, the ICC observed in the FSM subgroup at the analysis stage (0.16 for maths, 0.07 for reading) was lower than the 0.18 predicted in the protocol. Due to these changes the final analysis was powered for FSM pupils, even though the trial was not originally designed to be powered for this subgroup. By 'powered' we mean that the MDES for FSM pupils at the analysis stage (0.18) was lower than the effect size that was considered achievable in the protocol (MDES=0.19 among all pupils, see Table 9). In practice, this means that the FSM subgroup analysis is precise enough that it will usually (probability of 0.8) identify an intervention effect, if the true effect size is close to the 0.19 originally proposed.

All MDES calculations were performed using a customised spreadsheet, which is used internally at NFER. The formulae in this spreadsheet are methodologically equivalent to specifying a cluster-randomised design using the 'PowerUpR' package (Bulus *et al.*, 2021) in R, with both the level one and level two proportion of variance explained set to the square root of the pre-/post-test correlations.

Randomisation

This was a cluster randomised controlled trial with randomisation at school level. Schools were randomised into intervention and control groups using a 1:1 ratio. In order to aid delivery of the intervention and to ensure that each local CU area had an equal number of intervention and control schools in their region, randomisation was stratified by 11 CU areas.

Table 5: Number of schools randomised in each Children's University area

CU area	Control	Intervention	Total
Bexley	3	4	7
Devon and Cornwall	4	5	9
East London	10	9	19
Elevate[11]	18	18	36
Enrich[12]	12	11	23

[9] More than 150 schools were recruited as it was uncertain and challenging times during Covid-19 and it was anticipated that many schools may withdraw from baseline surveys. However, we were able to retain 164 schools at randomisation. More pupils volunteered than originally anticipated, which demonstrates that the process of determining volunteer cohort via the pupil survey and parent EOI was successful.
[10] The source of this estimate is: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/826252/Schools_Pupils_and_their_Characteristics_2019_Accompanying_Tables.xlsx.
[11] Children's University Elevate area includes schools across Cheshire, Halton, Lancashire, Liverpool, Merseyside, and Warrington.
[12] Children's University Enrich area includes schools across Merseyside, Cheshire, and Lancashire.

Essex and Suffolk	11	12	23
Peterborough	6	7	13
Rotherham	3	2	5
Wakefield	2	1	3
Westminster	6	6	12
Wolverhampton	8	7	15
Total	83	82	165

Randomisation was conducted in R by the NFER statistician who was not blinded to group allocation. Randomisation took place in October 2021 after baseline pupil surveys were completed. Please see Appendix A in the SAP for the randomisation code. A total of 165 schools were randomised, stratified by CU areas. Of these, 82 were assigned to intervention and 83 to control. Please see Table 5 for the number of schools per CU area.

Statistical analysis

The primary and secondary analyses were performed within an intention-to-treat (ITT) framework and followed the statistical analysis guidelines (EEF, 2022). These guidelines were updated since the study protocol and earlier drafts of the SAP were written. None of the updates to the guidelines altered the way in which analysis was conducted, except that the estimated impact of the intervention on FSM pupils was estimated using both a model restricted to the FSM subgroup and an interaction model (see 'Subgroup analysis' section below). All analyses were performed on the sample of volunteers: pupils that volunteered to take part in extracurricular activities such as Children's University programme prior to randomisation in intervention and control schools. As this was an ITT approach, if a pupil left their current school during the trial period, they were still included in the analysis. All primary and secondary modelling was 'complete-case' analysis: if a pupil was missing any variables in the model specified, they were not included in that part of the analysis. This excluded 5.6% (5.5% in the intervention, 5.6% in the control) of pupils from the maths primary analysis and 5.9% (5.9% intervention, 6.0% control) of pupils from the reading primary analysis.

Primary analysis

The primary analysis investigated whether Children's University impacts pupils' maths and reading attainment at KS2. Two models were run, with KS2 maths and reading scores as the respective outcomes. These were obtained from the NPD and are described in the 'Outcome measures' section above.

To account for clustering of KS2 scores within schools, a two-level (pupil and school) linear mixed-effects model was used for each outcome. The model for the maths primary outcome was:

$$KS2\_math_{ij} = \beta_0 + u_{0j} + \beta_1 intervention_j + \beta_2 KS1\_math_{ij} + \beta_3 CU\_locality_j + \epsilon_{ij}$$

where $KS2\_math_{ij}$ is the KS2 maths score of pupil I in school j. $KS1\_math_{ij}$ is a vector of indicator variables for three levels of KS1 maths attainment: 'working towards expected standard', 'at expected standard,' and 'above expected standard' ('below expected standard' as the reference level, see 'Outcome measures' section above). In this equation $intervention_j$ is the random allocation (intervention or control) indicator for school j, and u_{0j} is the random intercept for school j. $CU\_locality_j$ is a vector of ten indicator variables for the 11 strata of CU area, with 'Bexley' as the reference level.

For the reading primary outcome, the right side of the equation above was the same, except $KS1\_math_{ij}$ was replaced by the KS1 reading baseline measure. KS2 reading score was the outcome on the left side of the equation.

All multi-level models in the primary and secondary analyses were run using the package 'lme4' (Bates, 2015) in the software R.

Correction for multiple testing

As the number of outcomes in a study increases, the probability of at least one false positive finding (known as the 'family-wise error rate' or FWER) also increases. In this trial, there are two primary outcomes, so a Bonferroni correction can be applied to p-values from the primary analyses, restricting the FWER to 0.05 or less. In practice, the 'Bonferroni corrected' p-values are obtained by simply doubling the usual p-values from a model, to a maximum of 1.

As per the protocol, we planned to use the Bonferroni correction to correct p-values for the two study outcomes. However, when writing the SAP, the Bonferroni correction was replaced by the Romano-Wolf correction (Romano and Wolf, 2016). This was because the former does not account for the dependence between the test statistics of the two outcomes and so is overly conservative.[13] It was planned that the Romano-Wolf correction would be implemented using the R package 'crctStepdown' (Watson, 2021). However, when we implemented this during analysis, it was not possible to include covariates beyond the intervention indicator in the primary analysis models when using this package.[14] As an alternative, we attempted the Romano-Wolf correction in Stata, using the 'rwolf' and 'rwolf2' modules, but these modules were also not compatible with the primary analysis models.[15] We are not aware of further R or Stata packages that implement the Romano-Wolf correction for the primary analysis and so reverted to the Bonferroni correction specified in the study protocol: all corrected p-values in this report used the Bonferroni correction.

Further analyses that use the maths and reading outcomes (FSM subgroup analysis, association between non-cognitive measures and attainment) also have Bonferroni corrected p-values, for comparability with the primary analysis. Confidence intervals (CIs) are not corrected: they are 95% CIs, not 97.5%. This is because CIs are intended to give a range of values for an effect that are consistent with the data; unlike p-values they do not exist primarily to provide evidence for or against the specific hypothesis of zero effect.

Secondary analysis

The purpose of the secondary analysis was to investigate the effect of participation in CU activities on two non-cognitive pupil outcomes. A linear model with two levels (pupil and school) was calculated to account for clustering of pupil outcomes within schools. In the case of the 'Engagement 'secondary outcome, the model was:

$$Engagement_{ij} = \beta_0 + u_{0j} + \beta_1 intervention_j + \beta_2 baseline\_engagement_{ij} + \beta_3 CU\_locality_j + \epsilon_{ij}$$

Where $engagement_{ij}$ is the SEL 'Engagement' score for pupil I in school j at follow-up and $baseline\_engagement_{ij}$ is the same score measured by the baseline survey. As before, $intervention_j$ is the intervention or control indicator, $CU\_locality_j$ is a vector of indicators for the CU area variable and u_{0j} is the random intercept for each school.

For the other secondary outcome 'Valuing of school', the right-hand side of the above equation remains the same, except $baseline\_engagement_{ij}$ is replaced with the baseline measurement of 'Valuing of school'.

Analysis in the presence of non-compliance and dosage analysis

As the primary analysis is 'ITT', volunteers at intervention schools were considered to have received the intervention, regardless of their actual degree of participation in and recording of CU activities. Additional compliance analysis was

[13] Conservative in the sense that the actual FWER will be lower than the nominal rate of 0.05 and a higher power could be achieved while maintaining a FWER of 0.05.

[14] Using the package's stepdown() function on the fitted primary analysis models caused R to crash unless covariates were removed from the models (which would have made the resulting p-values meaningless). It is not clear from the package documentation whether covariates can in principle be included in the analysis models.

[15] 'rwolf' does not allow multilevel models to be specified and does not allow the primary analysis models to have different baseline covariates. 'rwolf2' does allow these, but appears not to account for clustering in the data correctly when executing the Romano-Wolf algorithm: it does not replicate the corrected p-values produced by 'rwolf' when a clustering variable is specified (using fixed effects framework with cluster-robust standard errors). The p-values produced by 'rwolf2' seem less plausible than those from 'rwolf' in this comparison, as they are actually lower than the corresponding uncorrected p-values. When there is no clustering specified the two modules produce the same corrected p-values.

therefore conducted to ascertain the impact of Children's University amongst pupils that fully engaged with and recorded the activities. When a pupil took part in a CU activity someone needed to record this information for it to be seen on CUO. This person could be the pupil, a teacher, a parent or Children's University staff. Recording of CU activity hours could occur at any time: it could be immediately after the activity took place or it could be much later (e.g. at the end of term). Hours could also be recorded in any quantity: if an activity consisted of ten one-hour sessions, this could be entered onto CUO as ten records of one hour, a single record of ten hours, or anything in between. The CUO data extracts received by NFER had one row for each occasion that CU activity hours were recorded for a specific activity and pupil; one CU activity for one pupil might have several rows, depending on how that activity was recorded. The data extracts contained the following variables that were used in this evaluation:

- pupil identifiers (Pupil ID, UPN) to allow matching with NFER data;
- highest award level received by the pupil for their participation in Children's University (e.g. 'bronze undergraduate award');
- free-text describing the activity (e.g. 'Maths club');
- the 16 binary variables indicating whether the activity was tagged according to each of 16 categories created by the Children's University Trust (e.g. 'Arts, culture, and music', see 'Type and range of CU activities' section below);
- the hours added for the activity; and
- the date that the hours for this activity were recorded (but not necessarily when it took place).

In total, three CUO data extracts were shared with NFER, which included CUO records up to November 2022, May 2023, and July 2023, respectively.[16] The November 2022 extract was used to monitor ongoing Children's University programme participation and to check that all information needed for this evaluation was included in the data. The May 2023 extract was used to measure CU activity participation for the impact analysis (as KS2 assessments are sat in May) and the July 2023 extract was used to measure CU activity participation over the whole trial period, for use in IPE analysis. Each extract was restructured by NFER so that a pupil and all their activities were represented by one row of data ('wide format' data). Because of the structure of the data extracts provided by the Children's University Trust, intervention pupils with no CU activities recorded were not included: these pupils[17] and control pupils were added back into the data by NFER with zero hours of total activities.

A challenge when investigating the causal effect of variables derived from the CUO data on KS2 attainment was that KS2 exams were sat in May, before the final CUO data extract was received in July. This meant the final extract would overestimate pupils' participation in CU activities (assuming they would continue participating throughout the rest of the Summer Term) up to the point that KS2 attainment was measured. It was also not possible to simply filter out activities with post-exam dates, as activity hours are often uploaded onto the platform in one go (e.g. all hours for a pupil uploaded at the end of a term), making it difficult to discern, which activities were completed before or after the KS2 exams. As a solution, we worked with the Children's University Trust to obtain an additional extract of CUO data shortly before the KS2 assessments. Local CUs and schools were encouraged to upload all pupil activity data to date in preparation for this additional extract, to enable an accurate reflection of pupils' CU activity participation up to that point. However, it was still possible that some activity data would not be uploaded in time for the May CUO extract (e.g. due to other priorities in schools) and hence we might underestimate participation. This underestimation may have occurred in practice: of all hours recorded for 2023, only 31% were recorded in the weeks leading up to KS2 assessments (01 January 2023–14 May 2023) and the remaining 69% were recorded after the KS2 assessments (15 May 2023–23 July 2023). The total hours logged between the start of the trial and the final July data collection were 35% higher than those logged up to the May data collection. While this could be related to Year 6 pupils having more time available after their KS2 assessments to participate in extracurricular activities, the reasonably large proportion logged after mid-May would suggest some earlier under-reporting or indeed delayed reporting in the 'KS2 interim dataset'. We discuss the quality and completeness of the CUO data in more detail in the section below on 'Assessing the accuracy of the CUO data'.

[16] Three school-level extracts were also shared on these months, but we understand these to be aggregated pupil-level data (i.e. they do not provide additional variables or information that could not be obtained from the CUO pupil data).
[17] With an understanding that those who did not record any hours on CUO, did not attend CU activities and did not accumulate any hours for awards.

There were measures analysed in this trial that investigated the relationship between hours of CU activities[18] and attainment, using the data available from CUO:

1. Whether a pupil recorded participation in at least 30 hours of CU activities. This is a dichotomous measure of compliance. A total of 30 hours of CU activities was considered an important threshold, as this is when the first award for Children's University participation is received (bronze).
2. The total number of recorded hours of participation in CU activities, i.e. a continuous measure of dosage.

Pupils in intervention schools were considered to have complied with the programme if their CUO data showed that they recorded taking part in at least 30 hours of CU activities. The main compliance measure for this study was therefore, binary and defined at pupil level. However, while 30 was the minimum required to receive an award in the Children's University programme, the benefits of the programme for pupils were expected to gradually accrue up to and beyond this threshold. To investigate this 'dosage' relationship, an additional measure was created that was equal to the number of hours recorded in the CUO data, or zero for pupils not recorded on CUO (including those at control schools). The methods used to analyse these measures are described for the maths primary outcome below, but the equivalent models were also run for the reading primary outcome. This means there were four models in total, investigating the effect of the two compliance measures on the maths and reading outcomes.

An instrumental variable (IV) analysis was performed, using two-stage least squares methods (Angrist and Imbens, 1995) to estimate the effect of binary compliance (30+ hours of CU activities recorded) with the intervention on maths attainment. For the first stage, the compliance indicator was regressed on treatment assignment together with covariates from the maths primary analysis model (the baseline KS1 maths indicator and CU area). For the second stage, KS2 maths scores were regressed on each pupil's predicted compliance value from the first stage, together with covariates from the maths primary analysis model. The coefficient for predicted compliance in this second stage was the complier average causal effect (CACE) estimate for the effect of compliance on KS2 maths scores.

The IV two-stage least squares methods described above was repeated for recorded dosage (measure 2 mentioned above), which was treated as a continuous variable. The modelling was the same as that described above, except that the outcome at the first stage was continuous rather than binary.

IV analysis was performed using the 'ivreg' (Fox *et al.*, 2024) package in the R software. As the two-step IV models were not multilevel, cluster-robust standard errors were calculated using the 'sandwich' package. (Zeileis, 2006; Zeileis *et al.*, 2020).

Missing data analysis

Missing data analysis was only performed for the primary outcomes. The proportion of missing cases was 5.6% (5.5% in the intervention, 5.6% in the control) for the maths model and 5.9% (5.9% intervention, 6.0% control) for the reading model. This was slightly above the 5% threshold at which no further analysis would be considered necessary (in accordance with the SAP and the EEF's statistical guidance document). Missing cases were entirely due to missing NPD variables: either lack of KS1 baseline or KS2 outcome. As we did not have permission to process the data of the n=9 pupils withdrawn before the analysis stage (see Figure 2) these pupils were not included in the missing data analysis.

It was specified in the SAP that four multilevel logistic regressions would be estimated, with missingness of each KS1 baseline and each KS2 follow-up measurements as the respective binary outcomes. All other variables from the primary analysis model were included as covariates, together with the following additional variables that may be associated with missingness:

- pupil FSM eligibility in 2022/2023 ('EVERFSM_6_P' from the NPD);
- pupil's school type (academy, maintained, or independent) in 2022/2023; and
- proportion of pupils eligible for FSM in 2022/2023 at the pupil's school.

[18] Unlike in the section 'Type and range of CU activities' below, time spent on an activity was only counted once in the compliance analysis, even if that activity had several CU activity categories (e.g. both 'Arts, culture, and music' and 'Mental health and well-being').

The intention was that if any of these variables demonstrated an association with missingness in the KS1 or KS2 maths/reading variable (depending on the model), as indicated by a p-value below 0.05, this would motivate further analysis. However, in practice none of the multilevel logistic regression models described above converged to a solution. Several approaches were attempted to address this issue, including rerunning the model with different solvers and removing various combinations of model predictors, but none were successful. It is likely that the underlying problem was the rarity of the event being modelled as an outcome (e.g. only 3% of pupils had a missing KS2 maths score), which is a limitation of the data, rather than the estimation methods used.

Although it was not possible to formally check exactly which of the above variables were associated with missingness, sensitivity checks were performed on the primary analysis models, which adapted them by: i) removing the baseline KS1 covariate; and ii) adding further covariates from the above list (FSM eligibility, school type, school FSM proportion). This was intended to provide a general sense of how robust the primary analysis results were to the addition (or removal) of variables that are potentially associated with missingness in the model outcome.

Subgroup analysis

We performed FSM subgroup analyses for each of the two primary outcomes; the KS2 maths outcome is used below for illustration purposes. The same analyses was performed for the KS2 reading outcome, except the KS1 maths baseline measure was replaced by the KS1 reading measure. In each analysis, p-values were corrected for multiple testing using the Bonferroni correction, as described for the primary analysis.

To investigate whether the effect of the intervention is different for pupils from disadvantaged backgrounds, subgroup analysis was performed for those pupils who were eligible for FSM. This used the 'EVERFSM_6_P'[19] variable collected from the NPD for the 2022/2023 academic year to define FSM eligibility. Two approaches were used: i) rerunning both primary outcome models for FSM-eligible pupils only; and ii) adding an interaction between FSM-eligibility and intervention assignment to the primary outcome models. Specifically, the two level (pupil and school) linear model used for (ii) in the case of the maths primary outcome was:

$$KS2\_math_{ij} = \beta_0 + u_{0j} + \beta_1 intervention_j + \beta_2 FSM_{ij} + \beta_3 intervention_j \times FSM_{ij} + \beta_4 KS1\_math_{ij} + \beta_5 CU\_locality_j + \epsilon_{ij}$$

In this equation $intervention_j$ is the intervention or control indicator for school j, FSM_{ij} is an indicator variable for whether the pupil is eligible for FSM and $intervention_j \times FSM_{ij}$ is the interaction between the two. This means that β_3 represents the differential effect of the Children's University programme on maths attainment for FSM-eligible pupils. Additionally, an effect size for $\beta_2 + \beta_3$ was calculated: this is an alternative to approach (i) for calculating the impact of the intervention in the FSM subgroup. A 95% CI for $\beta_2 + \beta_3$ was calculated using the R package 'multcomp' (Hothorn *et al.*, 2008).

Analysis of exploratory outcomes

There were four exploratory non-cognitive measures in this trial: Self-esteem; Goals and aspirations; Problem-solving; and Fear of communication. Each of these comprised the outcome in a multilevel linear regression, similar to the secondary analysis models. Modelling was conducted in the same manner as for the secondary outcomes, with the baseline measure corresponding to each exploratory outcome being included as a covariate in that regression.

Association between secondary outcomes and attainment

The logic model for this trial theorises that participation in CU activities increases the short-term outcome of positive identification with the school ('Valuing of school' measure) and the intermediate outcome of motivation to learn

[19] This variable indicates whether a pupil is known to have been eligible for FSM for any period in the last six years.

('Engagement' measure), among other factors. These in turn improve KS2 maths and reading scores. The possibility of investigating these causal relationships using mediation analysis was considered. However, as pupils took the KS2 exams before the follow-up survey and measurement of the secondary outcomes (the 'effect' precedes the 'cause'), it was decided that the causal interpretation implied by a mediation analysis was not sufficiently credible to proceed. Instead, a simple analysis was conducted in which the association of 'Engagement' and 'Valuing of school' with KS2 maths scores was investigated. Linear mixed-effects models were calculated for the KS2 maths outcome, using intervention pupils only:

$$KS2\_math_{ij} = \beta_0 + u_{0j} + \beta_2 Engagement_{ij} + \boldsymbol{\beta_4 KS1\_math_{ij}} + \boldsymbol{\beta_5 CU\_locality_j} + \epsilon_{ij}$$

$$KS2\_math_{ij} = \beta_0 + u_{0j} + \beta_2 Value\_school_{ij} + \boldsymbol{\beta_4 KS1\_math_{ij}} + \boldsymbol{\beta_5 CU\_locality_j} + \epsilon_{ij}$$

In these equations, terms are defined as for previous models. $Engagement_{ij}$ and $Value\_school_{ij}$ are the follow-up 'Engagement' and 'Valuing of school' measures for pupil i at school j. If β_2 is larger than zero, this indicates that pupils with high 'Engagement' (or 'Valuing of school') close to the time of their KS2 exams had higher average attainment. One causal explanation for this (among others, recalling the exams precede follow-up 'Engagement' measurement) is that higher engagement causes higher KS2 attainment, corroborating one aspect of the logic model.

Both models were repeated using KS2 reading score as the outcome and including the baseline KS1 reading measure instead of KS1 maths as a covariate, so that there were four models in total. Bonferroni corrected p-values were calculated for each pair of maths and reading outcomes; for example, a correction for two hypotheses was applied to the two models with 'Engagement' as a predictor and the outcomes of KS2 maths and reading scores, respectively.

Type and range of CU activities

We investigated whether the amount of participation in certain types of CU activities is associated with each primary outcome. This analysis used CU participation data collected via the CUO platform. When an activity is registered for Children's University validation by its provider (the pupil's school or an outside organisation) they are asked to classify the activity using up to four categories, for example, 'Arts, culture. and music', 'Careers and enterprise', and 'Citizenship' (see the 'Intervention' subsection under 'Introduction' for the description for how activities are classified).

A two-level (pupil and school) linear regression model was used to explore the association between amount of time pupils spend undertaking specific types of activities and KS2 maths score, specified as follows:

$$KS2\_math_{ij} = \beta_0 + u_{0j} + \boldsymbol{\beta_2 KS1\_math_{ij}} + \boldsymbol{\beta_3 CU\_locality_j} + \boldsymbol{\beta_4 activity\_hours_{ij}} + \epsilon_{ij}$$

The entries of vector $\boldsymbol{activity\_hours_{ij}}$ are the number of hours spent on each type of CU activity listed above; it is a vector of length 16, with zero entries where a pupil has not undertaken activities of that category. Following on from the performative dance example above, if a pupil's record shows they had spent nine hours on this activity, but no time on any others, then $\boldsymbol{activity\_hours_{ij}}$ would have entries of '9' for each of 'Arts, culture, and music' and 'Sports and physical', with zeros elsewhere. Other covariates are defined as described in the 'Primary analysis' section above. This analysis only included volunteer pupils at intervention schools.

The programme logic model outlines how participating in a wide range of activities leads to positive outcomes for children. Through these activities, children develop short-term and intermediate outcomes. To investigate this component of the logic model—the impact of the range of activities on outcomes—further analysis was performed for intervention volunteers that took part in at least one CU activity, again using data from CUO. The concept of activity range was explored using two separate dichotomous measures:

1. 'Many' activities. Whether the number of different CU activities a pupil recorded participating in[20] was greater than the sample median.[21]
2. 'Diverse' activities. Whether the number of different activity categories (of the 16 listed above) assigned to the pupil's CU activity records was greater than the sample median. All categories were counted even if they were assigned to the same CU activity.

For example, consider a pupil with the following activities recorded:

- performative dance (categories: 'Arts, culture, and music', 'Sports and physical');
- dance lessons (categories: 'Arts, culture, and music', 'Sports and physical'); and
- gardening club (categories: 'Outdoor learning', 'Nature and the environment', 'Social and community action').

This pupil would have three different CU activities for calculating whether they took 'many' activities, despite the apparent similarity of 'performative dance' and 'dance lessons'. For calculating whether the pupil had 'diverse' activities, they would have five different activity categories, even though three of these were assigned to the same activity (gardening club). The value of three activities would then be compared to the sample median to determine whether the pupil had 'many' activities (yes or no) and the value of five categories would similarly be compared to the sample median to determine whether they had 'diverse' activities[22] (yes or no).

The 'many' and 'diverse' indicators were then included together in the following two-level (school and pupil) linear regression:

$$KS2\_math_{ij} = \beta_0 + u_{0j} + \beta_2 KS1\_math_{ij} + \beta_3 CU\_locality_j + \beta_4 many\_activities_{ij} + \beta_5 diverse\_activity\_categories_{ij} + \beta_6 many\_activities_{ij} \times diverse\_activity\_categories_{ij} + \epsilon_{ij}$$

Here $many\_activities_{ij}$ is an indicator variable for whether the pupil had 'many' activities, as described above. Similarly, $diverse\_activity\_categories_{ij}$ is an indicator variable for whether the pupil had 'diverse' activity categories, as described above. The interaction between these represents a possible additional effect associated with taking part in many activities of diverse types.

It is also important to note that because participation in certain types of CU activities is not randomised,[23] it is not possible to draw causal conclusions from both these analyses. If, for example, pupils that spend more hours on maths-related CU activities had better KS2 maths scores, this could be due to the nature of the pupils who are interested in such activities (e.g. more engaged by maths), rather than as a direct consequence of activity participation. This analysis was therefore, considered exploratory, focusing on associations rather than causal inference.

Items on 'Future life and aspirations'

In addition to the items used to construct the non-cognitive outcomes for this trial (e.g. 'Goals and aspirations'), the follow-up pupil survey contained two further items relating to pupils' 'Future life and aspirations'. The first of these asks pupils to choose what they would most like to do when they are 18: one of five potential options could be chosen:

- Get a (full-time) job.
- Study at university.
- Get a job and study at the same time.

[20] Different activities were identified using their free-text descriptions in the CUO data: different free-text descriptions indicated different activities.
[21] The calculation of the median number of activities did not include values of zero, as this analysis was only for pupils that took part in one or more activities.
[22] The way the activities are categorised within CUO, there are a number of ways in which diversity could have been considered. This was one of them where an activity with four different categories will be given the same weightage as four different activities, each with one category.
[23] Nor is it amenable to quasi-experimental methods that seek to mimic randomisation such as IV analysis. IV analysis would require no causal pathway between the IV (randomisation) and the outcome (KS2 maths score) other than through the variable of interest (e.g. hours spent on sports clubs), which is not the case here.

- Do something else.
- Not sure.

Pupils could provide a free-text response if they selected 'do something else', to specify what they would like to do. The number and proportion of pupils selecting each option in the control and intervention groups are reported, and chi-squared tests were performed to test for a difference between the groups.

The second item asks pupils to order seven statements from 'most' (rank 1) to 'least important' (rank 7) in their future; the statements were:

- Getting good grades at school.
- Going to university after finishing school.
- Finding a job.
- Having enough money.
- Buying a house.
- That I am happy.
- That I am healthy.

Each statement's median rank in the control and intervention groups is reported and the distribution of ranks in the control and intervention groups was compared using Mann-Whitney U tests.

Estimation of effect sizes

All binary predictors such as the intervention indicator were converted to an effect size for this trial. The effect size was calculated as:

$$ES = \frac{\hat{\beta}}{\sqrt{\sigma_S^2 + \sigma_{error}^2}}$$

$\hat{\beta}$ is the coefficient for the predictor after adjusting for covariates, while σ_S^2 and σ_{error}^2 are the between-school and within-school variance obtained from an empty model with the same outcome. To obtain a 95% CI for the effect size, a CI for $\hat{\beta}$ was first calculated by adding or subtracting 1.96 times its standard error. The end points of this CI were then divided by the denominator in the formula given above. Continuous predictors were not converted in an effect size; their beta coefficients are presented on their raw scale in the 'Impact evaluation results' section (described there as an 'estimate' rather than an 'effect size').

Estimation of ICC

The ICC for the maths primary outcome model was calculated as the proportion of maths score variance attributable to level 2 (between-school) variation. The ICC was calculated for the maths primary analysis model and for an empty model (one with no covariates). This was then repeated for the reading primary outcome model, so there were four ICCs calculated in total.

Implementation and process evaluation

Research methods

The evaluation team drew on a range of data collection methods to answer the IPE research questions (set out in the 'Evaluation objectives' section). An overview of the IPE methods is presented in Table 6 below.

Table 6: IPE methods overview

Research methods	Data collection methods	Participants / data sources	Data analysis methods	Research questions no. addressed	Implementation/ logic model relevance
Business as usual	Online survey (intended n=164; achieved n=70 intervention, n=73 control)	All schools (baseline) Control schools (endpoint)	Descriptive statistics	6	Business as usual
Local CU manager interviews	Semi-structured video interviews (intended n=22 [2 x 11]; achieved n=20 [2 x 10])	Local CU managers Summer 2022 Summer 2023	Deductive coding, thematic analysis	1, 2, 3, 4, 5	Quality, Implementation support, Responsiveness, Scale-up, Perceived outcomes
Children's University Trust interviews	Semi-structured video interviews (intended n=2; achieved n=3)	Children's University Trust intervention lead (summer 2022 and 2023) Children's University Trust chief executive officer (CEO) (summer 2023)	Deductive coding, thematic analysis	3, 4	Quality, Implementation support, Scale-up
School Children's University coordinator survey	Online questionnaire (intended n=81; achieved n=66)	Children's University coordinators in all intervention schools	Descriptive statistics	1, 3, 5, 6	Usual practice, Responsiveness, Quality, Implementation support, Perceived outcomes
Pupil survey	Baseline and Endpoint paper questionnaire (intended n=5,502; achieved n at endpoint =2,273 intervention, 2,280 control)	All pupils	Basic frequencies	2, 5 (intervention) 6 (intervention and control)	Implementation, Perceived outcomes, Usual practice
Case studies	Semi-structured video or in-person interviews (intended n=6; achieved n=6)	Initially intended as Children's University coordinators and headteachers in schools with high-pupil participation	Inductive/deductive coding, thematic analysis	1, 2, 3, 5	Responsiveness, Quality, Implementation support, Adaptation, Perceived outcomes

	Semi-structured video or in-person focus groups (intended n=12 [2 x 6 groups of 4–6]; achieved n=10 [2 x 5 groups of 4–6])	Pupils in schools with high-pupil participation	Inductive/deductive coding, thematic analysis	2, 5	Responsiveness, Perceived outcomes
	Document analysis (intended n=6; achieved n=6)	School websites, Children's University promotional material for schools with high-pupil participation	Within-case analysis; context analysis	3, 6	Context, Usual practice
CUO data	Data export from CUO	Intervention schools (school level)	Basic frequencies, descriptive analysis	1	Fidelity
	Data export from CUO	Intervention schools (pupil level)	Descriptive analysis and CACE analysis for compliance measures	2	Compliance, Fidelity, Dosage

Data collection

Business as usual (BaU) survey

In September 2021, teachers from control and intervention schools were asked to complete a baseline BaU survey. The survey asked schools about the extracurricular activities offered to their upper KS2 pupils (Year 5 and Year 6) in the 2020/2021 academic year (the year before the trial began). Importantly, this survey acknowledged that 2020/2021 was not a typical year for schools due to the Covid-related context, and asked schools to comment on how 2020/2021 compared with previous more typical years.[24] Schools were also asked to provide details of the extracurricular activities they planned to offer in the 2021/2022 academic year (the first year of the trial).[25] Again, to acknowledge this may have continued to be atypical, we asked schools to say how their plans compared to pre-pandemic activity.[26] In addition, schools were asked if their pupils received any awards or celebrations for their participation in extracurricular activities and how their provision compared to before the pandemic. This provided the research team with an understanding of usual extracurricular practice across all schools. Of the 164 randomised schools, 143 (intervention n=70 and control n=73) completed the BaU baseline survey.

An endpoint survey was sent to control schools at the end of the 2022/2023 academic year. This was an adapted version of the BaU questions at baseline and asked about the extracurricular activities available to the trial cohort of pupils when they were in Year 5 and Year 6, whether or not rewards were received, and how this provision compared to before the pandemic. Overall, 74 of the 83 control schools completed an endpoint BaU survey, with 68 of these schools also having completed the BAU survey at baseline. Five schools that completed the baseline BAU survey did not complete it at endpoint.

[24] The survey asked: 1. During the last academic year (2022/2021), were extracurricular activities on offer to upper KS2 pupils (Years 5 and 6) in your schools? (Yes/No). 2. We are aware that schools' ability to offer extracurricular activities may have been affected by Covid restrictions. Please indicate which of the following statements is true for upper KS2 pupils in your schools (there were fewer, a similar number, more…extracurricular activities on offer in our school last academic year [2020/2021] than in previous years).

[25] How these predictions compared to the reality of what was delivered in that year is addressed under the 'Business as usual in control schools' section.

[26] The survey asked: 5. Is your school offering, or planning to offer, any extracurricular activities to upper KS2 pupils in the current academic year (2021/2022)? (Yes/No). 6. Please indicate how your current offer of extracurricular activities compares with what your school offered upper KS2 pupils before the pandemic (prior to March 2020) (we are offering fewer, a similar number, more…extracurricular activities in the current academic year (2021/2022) than before the pandemic).

Local CU Manager and the Children's University Trust interviews

In summer 2022 and summer 2023, the evaluation team conducted online interviews with local CU Managers in 10 of the 11 areas involved in the trial. The CU Manager in one area was not contacted in either year for an interview as there was only one intervention school in that area and they had not engaged with Children's University's offer. These interviews helped the evaluation team to understand the support local CUs provided to schools, how Children's University was implemented both within schools and across the area more widely, the extent to which schools and pupils engaged with Children's University, and facilitators and barriers encountered both by schools and the local Children's University themselves.

In summer 2022 and summer 2023, the intervention lead at the Children's University Trust participated in an online interview and, in summer 2023, the CEO of the Children's University Trust also participated in an online interview with the evaluation team. These interviews helped the evaluation team to understand the centralised Children's University support provided to schools and local CUs to deliver the programme at scale, perspectives on implementation across areas involved in the trial, and views on further scale-up.

*Sch*ool CU Coordinator survey

The school CU Coordinator survey was administered online in summer 2023. CU Coordinators from 66 of the 81 intervention schools completed the survey. The survey asked CU Coordinators about the support they had received over the trial period, their school's extra-curricular offer, pupil participation in CU, parental engagement, CUO, perceived outcomes and costs of implementing Children's University. CU Coordinators were also asked how they had supported the participation of disadvantaged pupils.

Pupil survey

The baseline pupil survey was administered by school staff and endpoint pupil surveys were administered in schools by NFER test administrators. The baseline survey was conducted in September 2021 and was completed by 5,502 pupils (intervention n=2,726 and control n=2,776) in 163 schools.[27] The endpoint survey was conducted in summer 2023 and was completed by 4,553 pupils (intervention n=2,273 and control n=2,280) in 156 schools. Along with the secondary outcome measures, the survey asked pupils at both timepoints about the extracurricular activities they participated in and whether they received awards for these. To help pupils to think through the different activities they do, activities were divided into those that took place at school but before school, at lunchtime or after school (in-school activities) and those that took place outside of school (out-of-school activities). The endpoint survey also asked pupils in intervention schools about their views on elements of Children's University and perceived outcomes from participating in the programme.

It is important to note that the CUO data and the survey data are not reporting the same data fields and are not interchangeable. As the pupil survey asked specifically about the 'clubs [they] take part in before school, at lunchtime or after school' and the 'clubs or activities they go to outside of school', it is likely that pupils will not have included in their responses one-off activities such as CU challenge sheets or museum visits, or school-organised events such as trips or residentials. As these kinds of activities were often validated by the CU or schools, they were likely to be included on CUO, which could lead to a higher number of activities being reported for pupils on CUO than they would necessarily themselves recognise as clubs they participate in. Conversely, the survey questions about participation in extracurricular activities were about any extracurricular activities that intervention and control pupils had done—i.e. they could report participating in any sports club for example, not just a CU validated sports club (not every extracurricular activity in an intervention school is a CU activity). It was only the endpoint survey questions <u>about</u> the programme where intervention pupils were specifically responding about their participation in the programme.

Case studies and interviews

Case studies were conducted with six schools across six CU areas over spring and summer 2023. Five of these case studies involved in-person interviews with the CU Coordinator and headteacher (or other senior leadership team [SLT] representative), as well as two pupil focus groups of between four and six pupils each. Four focus groups were carried

[27] An additional school completed the pupil surveys, but the completed papers were lost in transit.

out in-person and one online (due to the school being unable to accommodate a visit). The sixth case study involved only one online interview with the CU Coordinator due to capacity pressures within the school.

The research team adopted a purposive sampling technique using an interim extract of CUO data and schools' baseline responses to ensure that schools selected for case studies had:

- good pupil participation (we purposefully wanted to explore actual participation—see below for data collection planned for lower levels of engagement);
- a range of high and low extracurricular activity at baseline;
- were from different CU areas; and
- were a mix of urban and rural schools.

Initial sampling took place in autumn 2022, with further sampling taking place in spring and summer 2023 to identify additional schools to participate in the case studies. In total, 26 schools across nine of the local CU areas involved in the trial were invited to participate in a case study between December 2022 and July 2023. Limited response rates, likely due to school capacity pressures, resulted in case study schools that did not necessarily represent those recording the largest number of CU activities.

The evaluation team had also initially planned to conduct ten online interviews with CU Coordinators in schools with lower levels of engagement. Low response rates to this request resulted in only one of these interviews being conducted. The data from this interview has still been included in our aggregated analysis, given that this now reflects a range of engagement levels rather than only the most engaged as had originally been intended (see above). To replace these interviews, additional questions were added to the CU Coordinator survey and case-study interview schedule to gather data on barriers to participation in Children's University and challenges schools had faced with engagement. The schools covered by the qualitative data collection methods ultimately covered a range of low to high engagement levels (according to pupil participation rates on CUO), suggesting a useful sample for understanding effective practice with regards to implementing the intervention and the nature and breadth of challenges faced. Further, different levels of deprivation were well represented in the CU Coordinator survey.

The school-level interviews explored implementation of Children's University within schools, the support received from local Children's University organisations and the Trust, facilitators and barriers to implementation, and perceived outcomes.

CUO data: school and pupil levels

While all 81 intervention schools and 2,755 volunteer pupils were expected to use CUO for the trial, only 77 intervention schools and 2,132 volunteer pupils did so in practice. All school-level and pupil-level data was extracted from CUO in two tranches in autumn 2022 and summer 2023, to inform both case study selection and the evaluation team's understanding of the range and types of activities pupils participated in over the trial period.

As noted above, one-off activities such as CU challenge sheets and museum visits, as well as school events, visits and residentials could also be validated and recorded on CUO. However, these kinds of activities would not necessarily be recognised by pupils when self-reporting the clubs and activities they attend.

Data collection instruments

The IPE research team developed all of the data collection instruments used in the IPE: baseline and endpoint BaU surveys; CU Coordinator survey; baseline and endpoint IPE questions for the second part of the pupil survey[28]; interview schedules for local CU Managers and the Children's University Trust; case study interview schedules for headteachers, CU Coordinators, and pupil focus groups; and CUO data extraction templates. The research team collected all data

[28] N.B. The pupil survey instrument also included the secondary outcome measures (i.e. the first part of that survey)—described in the 'Outcome measures' section of this report. In this IPE sections of this report, we report on the data from IPE questions from the pupil survey.

from surveys and interviews. The CUO data was collected by the Children's University Trust and shared via a secure portal with the NFER.

Rationale for the data collection methods utilised

NFER researchers chose the range of data collection methods outlined above to achieve both breadth and depth for the IPE. The logic model was used to help prioritise data collection to focus on the key features of the intervention and the assumptions underpinning it. The surveys provided an efficient way of measuring implementation and fidelity and informing our understanding of usual practice across a large number of schools. The qualitative information gained from interviews with school staff, pupils, local CU Managers and the Children's University Trust yielded further insight into the implementation and perceived outcomes of Children's University.

Analysis

Interviews were written up as verbatim transcripts and uploaded to the qualitative data analysis software MAXQDA. High-level deductive coding was used to sort the data into relevant themes based on the programme logic model, IPE dimensions, and IPE research questions. The evaluation team then used detailed inductive coding to draw out the key findings under each of these themes. This process sought to identify patterns in the data and to test the assumptions of the logic model (including parental support for pupil extracurricular participation, school facilitation of participation among pupils eligible for FSM, and the availability of validated activities with external learning providers). Qualitative data from the pupil focus groups was summarised and mapped against the IPE research questions.

BaU and endpoint survey responses were analysed to explore the school- and pupil-level impacts specified in the logic model, in particular any differences between control and intervention schools at endpoint in relation to the range of extracurricular activities provided by schools. Quantitative data from the CU Coordinator and pupil surveys was analysed using R. BaU data was analysed using SPSS (SPSS Inc., Chicago, IL, USA). This analysis was conducted with a full audit trail and quality assured by a senior statistician at NFER.

Extracts of CUO data were shared with NFER by the Children's University Trust, both a pupil-level dataset and a school-level dataset (the pupil data aggregated to calculate school-level information). Analysis of pupil-level CUO data was conducted in summer and autumn of 2023 to explore the amount and nature of individual pupil participation, including data on the number of hours of CU activities attended, the categories assigned to activities (e.g. 'Arts culture and music') and the award levels they received. Analysis explored the engagement and participation of pupils eligible for FSM, compared to non-FSM pupils, using the 'EVERFSM_6_P' variable from the NPD. Both the school- and pupil-level CUO data was analysed using R.

The evaluation team triangulated the IPE qualitative and quantitative data sources in order to cross-validate the results and support the interpretation of the findings.

Costs

Approach

The objective of the cost evaluation was to create an estimate of the costs borne by a school if they decided to take part in Children's University. We estimated the average monetary costs to the school using data from a subgroup of 25 intervention schools delivering the Children's University programme as part of the trial. These schools were selected to represent all intervention schools on school characteristics: Office for Standards in Education, Children's Services and Skills (Ofsted) rating, KS2 attainment, school FSM eligibility, urban/rural, and school size. We also estimated the average amount of time school staff dedicated to taking part in the intervention. Both monetary costs and the time invested by school staff (time costs) were estimated to provide a full picture of the investment needed to take part in Children's University.

We calculated the monetary cost per pupil per year estimate by dividing the average cost per school per year by the average number of pupils taking part in Children's University per year. The average monetary cost to a school per year is calculated using estimated costs over a three-year period (following the EEF cost guidance; EEF, 2023). Programme start-up costs, which are borne only in the first year of the programme are therefore, presented as spread across a three-year period rather than in the initial year of the programme. Costs in terms of time invested by school staff were

also estimated per school over a three-year period. These time costs were also split between time spent on set-up tasks and time needed for recurring tasks, which would be repeated each year.
Sensitivity analysis was used to understand how costs per pupil varied across schools offering different types of activities and those with different local CUs. Variations included in the estimates in this section were the impact on per pupil costs of whether or not schools paid for the graduation ceremonies and what types of activities were run in the school.

It is also important to consider any costs in relation to costs borne by schools running clubs as part of their usual activities. We endeavour to understand these BaU costs by collecting data on the monetary costs of running extra-curricular activities as part of their usual offer to students. We considered costs faced by schools allocated to the control group during the trial and by all schools before Children's University began in schools in order to establish costs associated with BaU activities. This enabled us to achieve an understanding of the additional monetary costs to schools of running Children's University over and above normal costs of running extra-curricular activities.

Data collection

Two BaU surveys were administered to gain an understanding of the monetary costs of extra-curricular clubs/activities that the school offered before the trial (sent to all schools at baseline) and at the end of the trial (sent to control group schools only). Rather than gathering data from all intervention schools, we invited 25 intervention schools to provide detailed cost data as we wanted to minimise the burden on schools. Schools were asked to complete three proformas (via Microsoft Excel). The Children's University Trust sent the first two school proformas whereas NFER sent the third school proforma.[29] Although incentives for the completion of cost proformas were not initially planned, the Children's University Trust were able to offer £75 to schools that completed the first two proformas, which helped with the response rate to the cost proformas. The school proformas collected information about costs to schools specifically and were completed by school staff. The other sources of school cost data were the school CU Coordinator survey in summer 2023 and cost data gathered during interviews with school staff. The two programme proformas were completed by the Children's University Trust who were working with local CU managers. These proforma included questions about their costs in terms of time and financial costs of different activities associated with running the programme. This data was used to triangulate estimates from the school proformas. Other sources of programme cost data were proformas collected from the local CUs. We also used administrative data from CUO to determine average number of activities offered and the number of pupils taking part in CU activities, etc. Please see the data sources in Table 7 below.

Table 7: Overview of data sources for cost estimates

Research methods	Instrument	When collected	Response	Cost estimates collected
BAU	Online survey (baseline)	Autumn Term 2021	143 trial schools (70 intervention, 73 control) (out of 164)	Usual cost of extracurricular activities (outside of Children's University)
BAU	Online survey (endpoint)	Summer Term 2023	74 control schools (out of 83)	Actual costs of extracurricular activities during trial period
Local CU Manager interviews	Semi-structured video interviews	Summer Term 2022 Summer Term 2023	10 (out of 11) 10 (out of 11)	Monetary costs to schools Parent costs (in-kind and monetary)
Children's University Trust interviews	Semi-structured video interviews	Summer Term 2023	1 (out of 2)	Monetary costs to schools
School CU Coordinator survey	Online questionnaire	Summer Term 2023	66 (out of 81)	School staff costs running Children's University Parent costs (in-kind)
Case studies	School staff interviews	Spring Term 2023	4 (out of 6)	Parent costs (in-kind and monetary)

[29] The organisation with the most frequent contact with intervention schools at the time a cost proforma was needed was assigned responsibility for sending it.

Three school cost proformas		Spring / Summer Term 2021 Summer / Autumn Term 2022 Summer Term 2023	17 (out of 25) 10 (out of 25) 7 (out of 25)	Monetary and time costs of setting up and running Children's University in school Parent costs (monetary)
Programme proformas (n=2)		Summer 2022 Summer 2023	7 (out of 11) 9 (out of 11)	Central Children's University set-up and ongoing monetary and time costs
CUO data	Data export from CUO	Intervention schools (school level) Intervention schools (pupil level)	7,643 activities logged in 77 schools	Average estimated number of activities offered per school Average number of pupils taking part in Children's University per school Average estimated number of weeks activities run for

Timeline

Table 8 below presents a timeline of activities related to the evaluation and intervention delivery.

Table 8: Timeline

Dates	Activity	Staff responsible/ leading
July 2019–September 2019	• Set-up meetings	EEF / NFER/ the Children's University Trust
October 2019–December 2019	• IDEA workshop • Begin protocol drafting • Secondary outcome survey development	The Children's University Trust / NFER NFER NFER
January 2020–March 2020	• Briefing webinar one for local CUs • Finalise secondary outcome pupil survey	The Children's University Trust / NFER NFER
April 2020–September 2020	• Trial activities paused (school closures as a result of Covid-19 pandemic)	The Children's University Trust / NFER
October 2020	• Resume trial activities • Briefing webinar one (second run) for local CUs	The Children's University Trust / NFER
November 2020–May 2021	• School recruitment • Schools sign MoU	The Children's University Trust
May 2021	• Refresher IDEA workshop	The Children's University Trust / NFER
June 2021–July 2021	• Schools provide pupil data	NFER
September 2021–October 2021	• Baseline survey data collection • Parent EOIs • Randomisation	NFER (with support from the Children's University Trust)
November 2021	• Send random allocations to schools and the Children's University Trust • Briefing webinar two for local CUs • Confirm CUO data specification	NFER The Children's University Trust / NFER

Dates	Activity	Staff responsible/ leading
		The Children's University Trust / NFER
November 2021	• Delivery of Children's University programme starts • CUO data records start	The Children's University Trust (supported by CU areas)
January 2022	• School cost proforma (set-up costs, sample of schools) • Collect set-up costs from local Children's Universities	NFER
June 2022	Telephone interviews with local CU Managers	NFER
July 2022	• School cost proforma (year one costs, sample of schools) • Collect year one costs from local Children's Universities	NFER / the Children's University Trust
November 2022	• Interim exploration of CUO data (school and pupil level)	NFER
February 2023–July 2023	• Case study visits and telephone interviews	NFER
May 2023–July 2023	• Export of CUO data (pupil level for use in compliance analysis) • Follow-up survey of school CU Coordinator • Follow-up BaU survey • Follow-up pupil surveys in all schools	NFER
June 2023	• Follow-up telephone interviews with local CU Managers • School cost proforma (year two costs, sample of schools) • Collect year two costs from local Children's Universities	NFER
August 2023	• Export of CUO data (school and pupil level)	NFER / the Children's University Trust
August 2023–December 2023	• NPD request and matching	NFER
January 2024–May 2024	• Analysis in Secure Research Service	NFER
May 2024	• First draft report to the EEF	NFER
June 2024–November 2024	• Report revision and publication	NFER / the EEF/ the Children's University Trust

Impact evaluation results

Participant flow including losses and exclusions

The flow of participating pupils and schools through the trial can be seen in Figure 2 below.

The Children's University Trust were responsible for school recruitment. They approached all state-funded primary schools in eligible Local Authorities (3,044) in 11 CU areas. Of this, 208 signed the MoU and 2,836 schools did not respond to the invite. NFER approached 208 schools to collect pupil data. Of these, 169 schools returned pupil data and 39 schools did not. These 169 schools were invited to take part in further baseline activities (baseline pupil surveys, baseline survey, and parent EOI). The 165 schools completed these baseline activities but one school returned empty baseline pupil surveys and was not eligible to be part of the trial and thus, removed. There were 7,090 pupils across 164 schools who were eligible to be considered for the trial. Of these pupils, 17 were withdrawn from data processing pre-randomisation and 1,485 did not volunteer to take part in extracurricular activities: 753 responded 'no' to the baseline survey volunteering question; 76 pupils' parents responded 'no' to the parent EOI; and for 672 pupils there was no response to either the parent EOI or pupil survey volunteering question.[30] Schools were then randomised with 81[31] to the intervention and 83 to the control.

While there were schools that did not engage with CU activities or did not complete the endpoint surveys (secondary outcomes), none of them withdrew completely from data processing. As the primary analysis required only routinely available NPD data, there was no loss to follow-up at the school level for this analysis, although n=9 pupils were lost to follow-up due to data processing withdrawals. Further pupils were then excluded from the primary analysis models (n=313 for maths, n=329 for reading) due to missing KS1 baseline data or KS2 outcome data. This is described in the 'Missing data analysis' subsection under 'Outcomes and analysis' section below.

For the secondary analysis (see Figure 3), successful follow-up required that pupils complete the endpoint survey. Of the 164 schools randomised, 134 (81.7%) returned at least one completed pupil endpoint survey (67 schools from each group). Of 5,588 pupils at randomisation, 4,553 pupils completed endpoint surveys. The follow-up rate at pupil-level was 82% in the intervention group (2,273 out of 2,763 pupils) and 81% in the control group (2,280 out of 2,825 pupils). Some pupils were then excluded from the secondary analyses because they did not answer all the survey items required to calculate both their pre- and post-test non-cognitive measure (n=283 for 'Engagement', n=241 for 'Valuing of school').

[30] For 16 pupils both the pupil and their parent responded 'no'; these are counted in both the n=753 and the n=76.
[31] One school returned empty baseline pupil surveys, so they were not eligible to be part of the trial and thus, removed. This school had been randomised to the intervention, so of the 82 schools randomised to the intervention, only 81 participated in the trial. Outside of the study flow diagram (e.g. for MDES calculations) 81 schools are treated as having been randomised to the intervention.

Figure 2: Participant flow diagram for the primary analysis

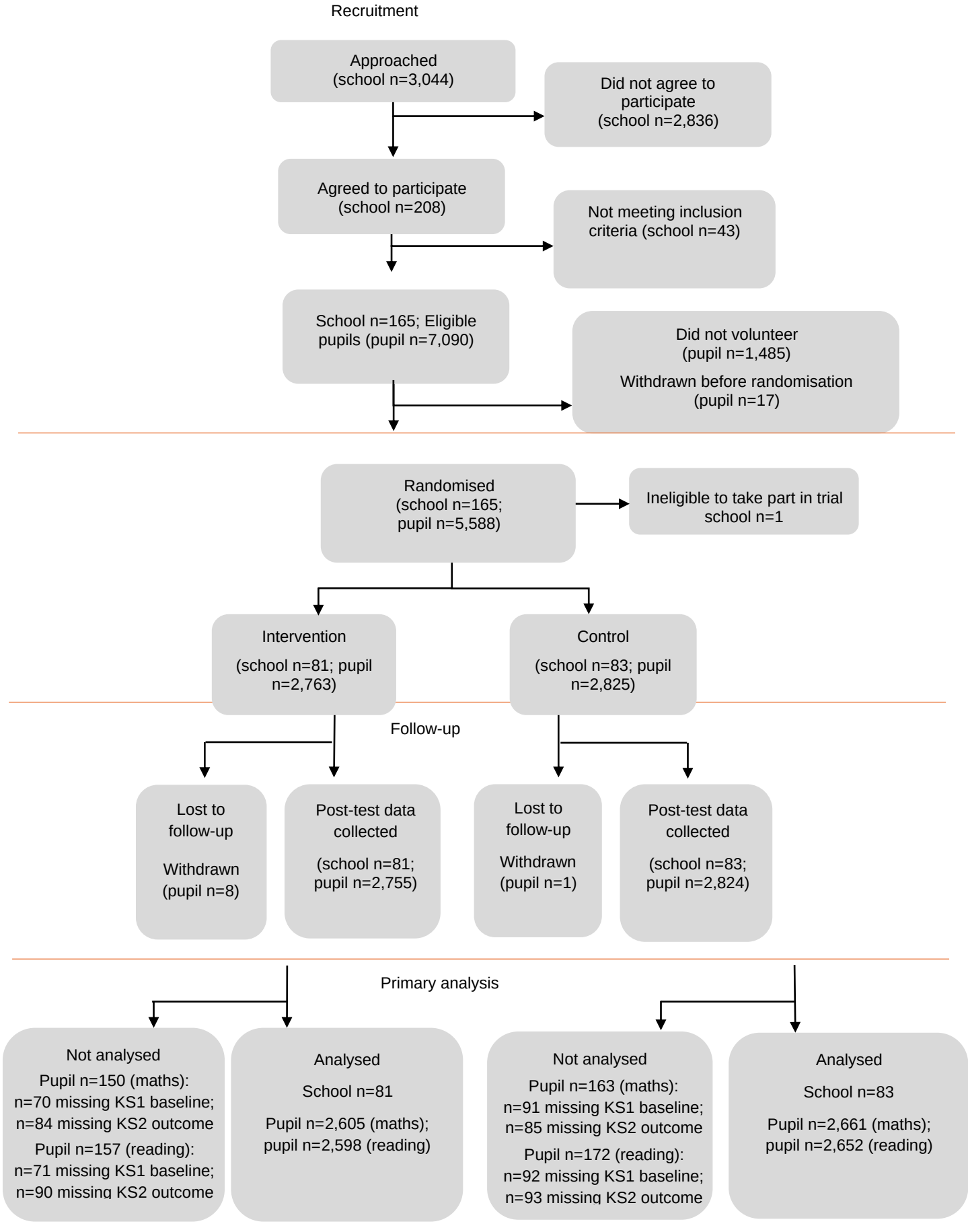
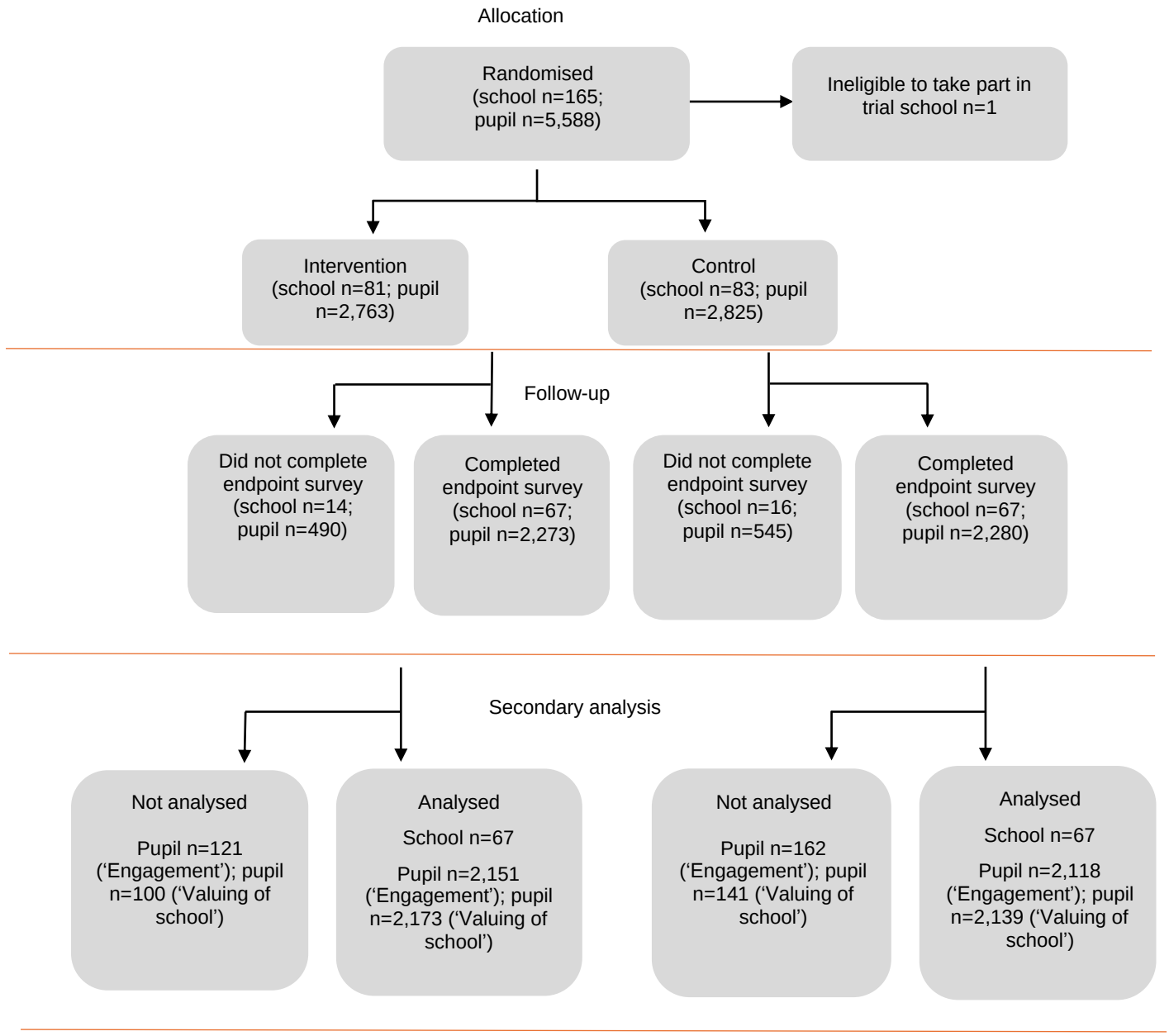


Figure 3: Participant flow diagram for the secondary analysis. The participant numbers before the follow-up stage are the same as for the primary analysis



MDES figures at the protocol, randomisation, and analysis stages are shown below in Table 9. While the number of pupils per school has dropped slightly between the randomisation and analysis stages, this is outweighed by the ICCs observed in the analysis data being lower than expected, leading to lower MDES values for both primary analysis models (0.15 for maths, 0.12 for reading) since randomisation. MDES values in the FSM subgroup are particularly low (0.18 for maths, 0.16 for reading) compared to the estimates at previous stages. This is because the proportion of FSM pupils observed in the analysis data (30% for maths or reading) is much higher than estimated at the protocol and randomisation stages (15.7%). This trial is 'adequately powered' for both all pupils and the FSM subgroup, in the sense that the MDES for both groups at the analysis stage is lower than the MDES for all pupils at the protocol stage. However, we note that the effect sizes actually observed in the primary analysis are much smaller in absolute value than the protocol MDES of 0.19. If the actual impact of Children's University is small (e.g. an effect size of 0.05) it is unlikely that this study would detect an effect on that scale.

Table 9: MDES at different stages

		Protocol		Randomisation		Analysis (KS2 maths / KS2 reading)	
		Overall	FSM	Overall	FSM	Overall	FSM
MDES		0.19	0.26	0.17	0.22	0.15 / 0.12	0.18 / 0.16
Pre-/post-test correlations	Level 1 (pupil)	0.65	0.65	0.65	0.65	0.68 / 0.64	0.66 / 0.61
ICCs	Level 2 (school)	0.18	0.18	0.18	0.18	0.16 / 0.08	0.16 / 0.07
Alpha		0.025	0.025	0.025	0.025	0.025	0.025
Power		0.8	0.8	0.8	0.8	0.8	0.8
One-sided or two-sided?		2	2	2	2	2	2
Average cluster size (volunteers)		20	3.14	34.07	5.35	32.11 / 32.01	9.60 / 9.56
No. of schools	Intervention	75	75	81	81	81	81
	Control	75	75	83	83	83	83
	Total:	150	150	164	164	164	164
No. of pupils	Intervention	1,500	235	2,763	434	2,605 / 2,598	803 / 801
	Control	1,500	235	2,825	444	2,661 / 2,652	772 / 767
	Total:	3,000	470	5,588	878	5,266 / 5,250	1,575 / 1,568

Attrition

There was a low attrition rate for the primary analyses, with 94.2% (maths outcome) and 94.0% (reading outcome) of randomised pupils being included in the respective primary analysis models. This low attrition rate is largely because pupils and their schools did not need to directly provide endpoint data for the primary analysis, as all required variables were obtained from the NPD. Engagement with the trial was not tied to data collection for the primary analysis, so if intervention pupils or schools did not participate in CU activities, then their data was still processed. The attrition rate was very similar between the trial arms: 5.7% in the intervention group versus 5.8% in the control for maths; and 6.0% versus 6.1% for reading. As this was slightly higher than the 5% threshold required by the EEF, we carried out missing data analysis (see the 'Missing data analysis' subsection in 'Outcomes and analysis' section).

Table 10: Pupil-level attrition from the trial (primary outcomes)

		Intervention	Control	Total
No. of pupils (KS2 maths / KS2 reading)	Randomised	2,763	2,825	5,588
	Analysed	2,605 / 2,598	2,661 / 2,652	5,266 / 5,250
Pupil attrition	Number	158 / 165	164 / 173	322 / 338

(KS2 maths / KS2 reading)	Percentage	5.7 / 6.0	5.8 / 6.1	5.8 / 6.0

Pupil and school characteristics

Table 11: Baseline characteristics of groups as randomised

School level (categorical)	Intervention group		Control group		
	n/N (missing)	%	n/N (missing)	%	
CU area					
Bexley	4/81 (0)	4.9%	3/83 (0)	3.6%	
Devon and Cornwall	5/81 (0)	6.2%	4/83 (0)	4.8%	
East London	9/81 (0)	11.1%	10/83 (0)	12%	
Elevate	18/81 (0)	22.2%	18/83 (0)	21.7%	
Enrich	10/81 (0)	12.3%	12/83 (0)	14.5%	
Essex and Suffolk	12/81 (0)	14.8%	11/83 (0)	13.3%	
Peterborough	7/81 (0)	8.6%	6/83 (0)	7.2%	
Rotherham	2/81 (0)	2.5%	3/83 (0)	3.6%	
Wakefield	1/81 (0)	1.2%	2/83 (0)	2.4%	
Westminster	6/81 (0)	7.4%	6/83 (0)	7.2%	
Wolverhampton	7/81 (0)	8.6%	8/83 (0)	9.6%	
Urban or rural location					
Urban	62/81 (5)	76.5%	61/83 (3)	73.5%	
Rural	14/81 (5)	17.3%	19/83 (3)	22.9%	
Type of school					
Academy	27/81 (X)	33.3%	27/83 (X)	32.5%	
Free school	X (X)	X	X (X)	X	
Local authority maintained	48/81 (X)	59.3%	52/83 (X)	62.7%	
Most recent overall Ofsted rating					
Outstanding	11/81 (0)	13.6%	12/83 (1)	14.5%	
Good	65/81 (0)	80.2%	64/83 (1)	77.1%	
Requires improvement	X (0)	X	X (1)	X	
Special measures	X (0)	X	X (1)	X	
School level (continuous)	N (missing)	Mean (SD)	N (missing)	Mean (SD)	
% of FSM pupils 2022/2023	76 (5)	29.1 (14.4)	80 (3)	27.1 (15.5)	
Pupil level (categorical)	n/N (missing)	%	n/N (missing)	%	Odds ratio (95% CI)
FSM eligibility 2022/2023					
Yes	853/2,755 (0)	31.0%	827/2,824 (0)	29.3%	
No	1,902/2,755 (0)	69.0%	1,997/2,824 (0)	70.7%	
KS1 maths outcome					
Above expected standard	627/2,755 (70)	22.8%	668/2,824 (91)	23.7%	0.90 (0.74, 1.09)
At expected standard	1,442/2,755 (70)	52.3%	1,486/2,824 (91)	52.6%	
Towards expected standard	514/2,755 (70)	18.7%	496/2,824 (91)	17.6%	
Below expected standard	102/2,755 (70)	3.7%	83/2,824 (91)	2.9%	
KS1 reading outcome					
Above expected standard	668/2,755 (71)	24.2%	729/2,824 (92)	25.8%	0.90 (0.75, 1.07)
At expected standard	1,399/2,755 (71)	50.8%	1,425/2,824 (92)	50.5%	
Towards expected standard	481/2,755 (71)	17.5%	444/2,824 (92)	15.7%	
Below expected standard	136/2,755 (71)	4.9%	134/2,824 (92)	4.7%	

Counts of fewer than three schools are supressed (indicated by an 'X') to prevent identification of individual schools.

Percentages may not add to 100 within a characteristic due to rounding and missing data. SD, standard deviation.

Pupil and school characteristics at the point of randomisation are shown above in Table 11 for the intervention and controls groups. CU area is unsurprisingly well-balanced between the intervention and control groups due to the randomisation being stratified by this variable, but chance imbalances in the remaining variables can be explored in Table 11. The school-level categorical variables are similarly distributed in each group, with the largest imbalance being between the proportion of rural schools (17.3% in intervention group, 22.9% in the control group). Intervention schools have a slightly higher average proportion of FSM pupils attending the school (intervention mean 29.1%, control mean 27.1%), and the proportion of FSM pupils among trial volunteers is also higher for the intervention (31.0% vs 29.3%). KS1 attainment is slightly higher among pupils in the control group for both subjects: the odds of being at or above the expected standard in maths is lower in the intervention group (odds ratio 0.90, 95% CI: 0.74 to 1.09) and similarly for reading (odds ratio 0.90, 95% CI: 0.75 to 1.07).

Considered together, we do not regard the chance imbalances observed in these variables to be a serious threat to the internal validity of our results. This is because randomisation produces valid results, even in the presence of chance imbalances in characteristics (and in any case the degree of imbalance observed here is moderate or small). Also, the primary analysis models include the KS1 baseline measures, which will account for the slight imbalance observed in these variables.

Outcomes and analysis

Primary analysis

As shown in Table 12, we found no evidence that the Children's University programme has an effect on pupils' KS2 maths scores; while the point estimate is negative (-0.05) the data is consistent with a range of positive and negative impacts, including zero (effect size: -0.05; 95% CI: -0.15 to 0.05). This uncertainty in relation to the size of the effect means we cannot conclude that the effect is non-zero. The estimated impact on KS2 reading score is negative (-0.09) and the range of values supported by the data does not include zero after correcting for multiple testing (effect size: -0.09; 95% CI: -0.17 to -0.01). However, the uncertainty in relation to the size of the effect means we cannot conclude that the effect is non-zero. Additionally, there is no apparent reason in the logic model or the IPE results (see the 'IPE results' section) that would suggest a mechanism for the Children's University programme to negatively impact pupils attainment (we discuss this further in the 'Conclusion' section).

Table 12: Impact of Children's University on the primary outcomes (KS2 attainment)

	Unadjusted means				Effect size		
	Intervention group		Control group				
Outcome	n (missing)	Mean (95% CI)	n (missing)	Mean (95% CI)	Total n (intervention; control)	Effect size (95% CI)	Bonferroni corrected p-value
KS2 maths score	2,605 (150)	104.4 (104.1, 104.7)	2,661 (163)	104.9 (104.6, 105.2)	5,266 (2,605; 2,661)	-0.05 (-0.15, 0.05)	0.731
KS2 reading score	2,598 (157)	105.0 (104.7, 105.3)	2,652 (172)	106.0 (105.7, 106.3)	5,250 (2,598; 2,652)	-0.09 (-0.17, -0.01)	0.046

Secondary analysis

Table 13: Impact of Children's University on the secondary (non-cognitive) outcomes

	Unadjusted means				Effect size		
	Intervention group		Control group				
Outcome	n (missing)	Mean (95% CI)	n (missing)	Mean (95% CI)	Total n (intervention; control)	Effect size (95% CI)	P-value

Engagement	2,151 (604)	13.3 (13.2, 13.5)	2,118 (706)	13.4 (13.3, 13.6)	4,269 (2,151; 2,118)	-0.03 (-0.13, 0.08)	0.582
Valuing of school	2,173 (582)	13.3 (13.1, 13.4)	2,139 (685)	13.3 (13.2, 13.4)	4,312 (2,173; 2,139)	0.00 (-0.10, 0.10)	0.988

The impact of the Children's University programme on the two secondary outcomes is shown in Table 13. Higher values are better for both the underlying scales so any effect sizes above zero represent an improvement in 'Engagement' or 'Valuing of school'. However, the effect sizes obtained are close to zero for both 'Engagement' (effect size: -0.03; 95% CI: -0.13 to 0.08) and 'Valuing of school' (effect size: 0.00; 95% CI: -0.10 to 0.10), with CIs covering a range of values, including zero. These results do not support the hypothesis that participation in the Children's University programme has any impact on 'Engagement' or 'Valuing of school' and so do not corroborate this important part of the Theory of Change.

Analysis in the presence of non-compliance

Before we report findings from the compliance analysis, we report below the accuracy of the data available on CUO.

Assessing the accuracy of the CUO data

As detailed in the 'Methods' section earlier, CUO had pupil records only for those pupils who recorded their CU activity hours. If pupils or schools had no records in the CUO data, this could be because they did not take part in activities, or it could be because their activities were not logged. The latter became more evident as we learned during the case study visits that a small number of schools and pupils who participated indeed did not engage with CUO and therefore, did not record their activity hours (please see 'IPE results' section for further details). However, most volunteered pupils from intervention schools recorded some CU activity data on CUO and for the purposes of compliance analysis, where no data was entered (i.e. no records on CUO) these were interpreted as having zero CU activity hours. Here is the top-level summary from CUO records.

By the end of the trial:

- A total of 2,132 volunteered intervention pupils had logged some CU activity hours[32] (77.4% of 2,755 who were followed up). Of the 81 intervention schools, 77 had at least one pupil recorded in the CUO data (95.1%) and 33 had all their volunteer pupils in the CUO data (41%).
- A total of 623 volunteered intervention pupils had no CU activity records (22.6% of those followed up). Of these, 70 pupils were from four schools where no pupil had recorded CU activity hours.
- Out of all volunteered intervention pupils who were followed up, i.e. including those with zero hours (n=2,755) on average, there were 17 hours (median[33]) of CU activities logged; 1,156 pupils (42%) had at least 30+ hours of CU activities recorded, and a notable proportion logged a smaller number of hours—613 pupils (22.0%) had one to ten hours recorded.

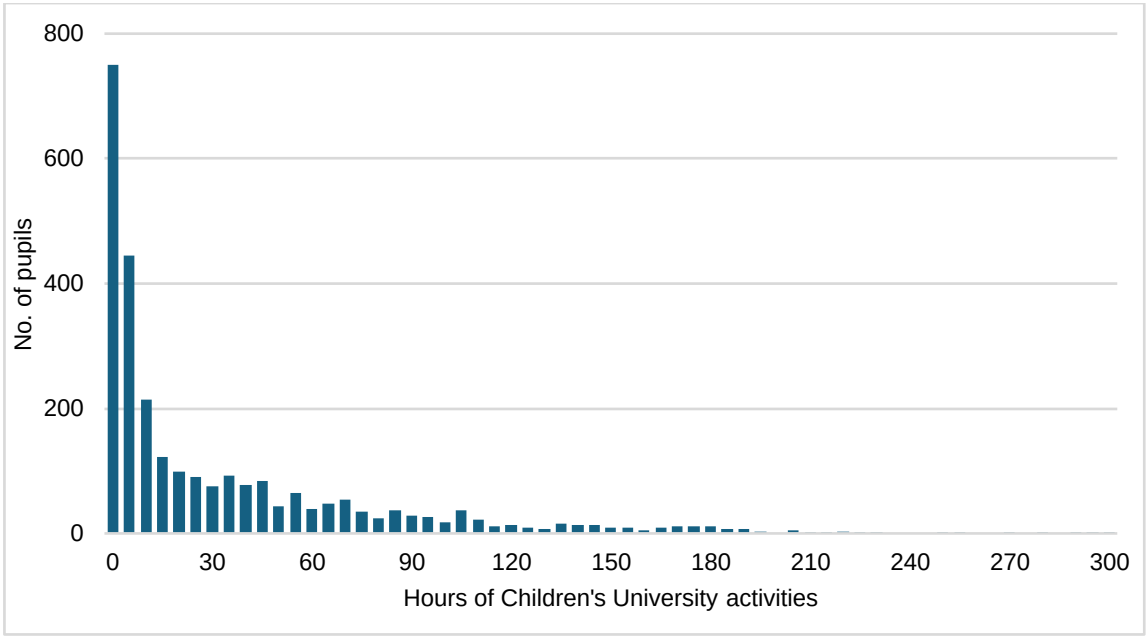
Looking at the May 2023 CUO extract that was used for compliance analyses:

- There were 2,005 volunteered intervention pupils who had logged some CU activity hours (72.8% of those with follow-up data). Of the 81 intervention schools, 77 schools had at least one pupil (95.1%) and 30 schools had all their volunteer pupils present in the data.
- There were 750 volunteered intervention pupils who had no CU activity records (27.2% of those followed up). Of these, 70 pupils were from four schools where no pupil had recorded CU activity hours.
- Out of all intervention pupils (n=2,755), on average, there were nine hours (median) of CU activities logged on CUO up to mid-May 2023; 941 pupils (34%) had at least 30+ hours CU activities recorded, and a not insubstantial proportion logged a smaller number of hours—659 pupils (23.9%) had one to ten hours recorded.

[32] Being in the CUO data meant that a pupil had one or more CU activities recorded; those with zero activities would not be in the CUO data.
[33] Due to some large outlier values, the median is reported throughout.

Figure 4 below presents the number of CU activity hours recorded on CUO per pupil from the start of the trial up to the point of KS2 assessments (14 May 2023). There were 28 pupils with over 300 hours of CU activities. Their records were omitted from the plot to improve readability. The maximum hours recorded was 1,111 hours (equivalent to around 14 hours a week based on two 39-week school years), which may not be realistic; we suggest that some incorrect recording of hours among this small number of pupils is possible.[34] For the pupils included in Figure 4 the full range of hours recorded (0–300) all seem plausible in principle: it is possible that some pupils did take part in a large amount of CU activity (300 hours, e.g. would be the equivalent of around four hours of extracurricular activity a week).

Figure 4: Number of activity hours recorded on CUO per pupil from the start of the trial up to the point of KS2 assessments (14 May 2023)



Notes: Data from CUO (n=2,755 pupils). The first bar represents pupils with exactly zero recorded hours, each subsequent bar represents bands of five hours (zero–five, five–ten, etc.) Pupils with more than 300 hours recorded (n=28) are not included to improve plot readability.

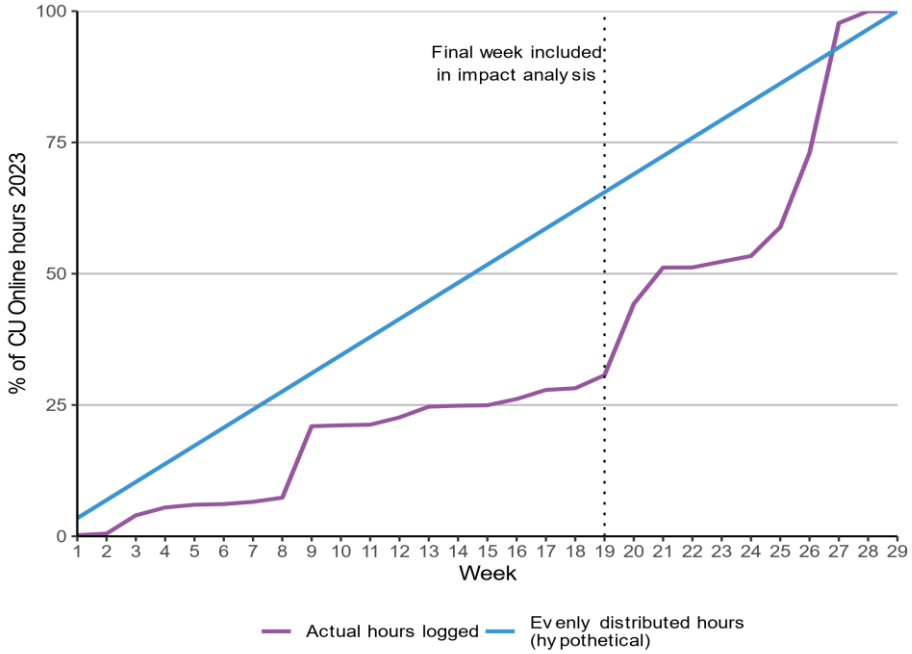
The only source of error in the CUO records that can be investigated using the available data is whether there is a notable difference between the number of recorded hours between the May extract and the July extract. If this difference is large, this could be due to children doing many more extracurricular activities between completion of KS2 assessments and end of term or quite simply there were delays in logging their hours for activities done until KS2 (see 'Methods' section earlier, for further explanation).

While it is not possible to ascertain whether all hours for a given pupil were completely logged up to the date of their KS2 assessments (the date 14 May 2023 was used), it is possible to examine the overall trend among pupils, in terms of when activity hours were logged. The cumulative activity hours logged on CUO for each week of the trial in 2023 is shown below in Figure 5. For each week the hours logged up to and including that week is shown, expressed as a proportion of all hours logged in 2023. In a hypothetical scenario where activity hours are logged completely every week, we might expect this proportion to increase by the same amount each week, as shown by the blue line in Figure 5.[35] The vertical gap between the purple and blue lines at Week 19 suggests that recorded activity hours up to that point underestimate actual activity participation. As shown in Figure 5, out of all hours recorded for 2023, only 31% cumulative CU participation hours were recorded in the weeks leading up to KS2 assessments and the remaining 69% were recorded after the KS2 assessments. This conclusion is also supported by the fact that there is no noticeable increase

[34] Pupils with very high recorded hours were still included in all models that used CU activity hours as an independent variable, such as the compliance analysis. Excluding pupils with over 300 hours of CU activities had little effect on estimates (results not shown).
[35] The blue line is only a simple approximation of what we would see if activities were logged accurately each week for two reasons: i) some activities do not take place during holidays; and ii) the level of participation in activities may fluctuate throughout the year (e.g. more sports in the summer due to warmer weather).

in the rate at which hours are recorded in the weeks leading up to 14 May 2023, so little evidence that attempts to encourage schools to record their outstanding activity hours by this date were effective. It is therefore, likely that on average the number of activity hours per pupil, as used in the compliance and other impact analyses, underestimates actual participation. The true average hours up to 14 May 2023 among all intervention pupils is likely to lie between that recorded (median 9 hours, mean 36.9 hours) and what was recorded up to 23 July 2023 (median 17 hours, mean 51.4 hours).This difference could either be a result of pupils actually doing more activities after the KS2 assessments or were simply delayed in recording these hours on CUO for activities they completed prior to KS2 assessments. It was difficult to ascertain, which one was the case when considering the completeness and accuracy of the pupil level CU participation.

Figure 5: Number of CU hours logged up to and including each week of 2023, displayed as a proportion of all CU hours logged in 2023



Each week begins on a Monday and all hours logged in 2023 up to and including the Sunday of that week are included. Important weeks on the graph are the first complete week of 2023 (Week 1, 02/01/2023–08/01/2023), the final week of CUO data included in the impact analysis (Week 19, 08/05/2023–14/05/2023) and the final week of CUO data collected for the trial (Week 29, 17/07/2023–23/07/2023). Moreover, CUO may not accurately reflect all the out-of-school extracurricular activities children were involved in, mainly because of challenges in engaging local learning providers in the validation process and hence children not being able to record them on CUO (see 'IPE results' section for further details).

Analysis in the presence of non-compliance and dosage analysis

The compliance rate was low, with 941 pupils (36.1% of the 2,605 intervention pupils analysed) recording 30+ hours of CU activities up to the point of taking their KS2 exams. Pupils who did not meet this compliance requirement consisted of intervention pupils with fewer than 30 hours recorded on CUO, intervention pupils without CUO records (i.e. zero CU activity hours on CUO) and pupils at control schools. All these 'non-compliant' pupils had the value zero for their binary compliance indicator in the first stage of the two-step IV regression; results for these models are reported in Table 14.

We found no evidence of an effect of compliance with Children's University (30+ hours of activities recorded) on KS2 maths attainment (effect size: -0.07; 95% CI: -0.18 to 0.04). The impact of compliance on KS2 reading scores is negative (effect size: -0.26; 95% CI: -0.38 to -0.14). These CACE estimates can be interpreted as the average difference between pupils with 30+ hours of recorded CU activities and control pupils that would have recorded 30+ hours, had Children's University been available to them. The estimates suggest that children who participate in and record more CU activity hours on CUO are negatively affected in reading, compared to those who participate in and record fewer hours. However, we would advise caution when drawing this conclusion. This is partly because of the data quality issues with the CUO data described above. It is also because CACE estimates rely on several assumptions to be valid, in particular the 'exclusion restriction': that assignment to the intervention has no effect on pupils that do not meet the compliance

threshold of 30+ hours. This assumption may be questionable for this trial, especially because pupils that do not have 30+ hours of CU activities recorded may still have some hours recorded, which could in turn influence their attainment. Similar limitations apply to the continuous dosage measure described in Table 14 below, albeit to a lesser degree.[36]

Table 14: Impact of participation in 30+ hours of CU activities (binary compliance measure) on KS2 attainment outcomes

		IV model diagnostics			Impact of compliance (30+ CU hours)	
Outcome	Total n (missing)	Weak instrument test: statistic (p-value)	Stage 1 F-Test: statistic (p-value)	Correlation between intervention and compliance indicators	Effect size (95% CI)	Bonferroni corrected p-value
KS2 maths score	5,266 (313)	1,599 (<0.001)	159 (<0.001)	0.46	-0.07 (-0.18, 0.04)	0.383
KS2 reading score	5,250 (329)	1,600 (<0.001)	159 (<0.001)	0.46	-0.26 (-0.38, -0.14)	<0.001

The impact of each additional hour of CU activities on KS2 maths and reading attainment is shown in Table 15. These results are consistent with the binary compliance results above, insofar as the estimate for maths (this time on the raw scale, as the predictor is continuous) is consistent with no effect and the estimate for reading is negative. For each additional hour of CU activity recorded, reading scores declined by -0.019 scaled score points: a reduction of 0.584 points per 30 hours of activities.

Table 15: Impact of each additional hour of participation in CU activities (continuous dosage measure) on KS2 attainment outcomes

		IV model diagnostics			Impact of each additional hour of CU participation	
Outcome	Total n (missing)	Weak instrument test: statistic (p-value)	Stage 1 F-Test: statistic (p-value)	Correlation between intervention and compliance indicators	Estimate (95% CI)	Bonferroni corrected p-value
KS2 maths score	5,266 (313)	695 (<0.001)	77 (<0.001)	0.34	-0.005 (-0.014, 0.003)	0.384
KS2 reading score	5,250 (329)	697 (<0.001)	78 (<0.001)	0.34	-0.019 (-0.028, -0.011)	<0.001

Missing data analysis

The amount of missing data in the primary analysis models was small: 5.6% of pupils for maths; and 5.9% for reading were excluded from the primary complete case analyses. This was due to missing KS1 baseline or KS2 outcome variables, all of which were missing for about 3% of pupils (see Table 16). While it was not possible to calculate which variables were associated with missingness using multilevel logistic regressions (see 'Methods' section above), the characteristics of pupils with and without each of the missing variables are reported in Appendix J. The most notable imbalance in these tables is that pupils with a missing KS2 maths score had lower attainment in their KS1 baseline (and similarly for reading). This may partly be due to the way these KS2 attainment variables are recorded on the NPD:

[36] A version of the exclusion restriction still applies in the case of continuous dosage measure: randomisation to the intervention can only affect pupil attainment outcomes by increasing the number of CUO hours recorded. However, this version of the restriction seems more likely to hold than in the binary case.

missing entries may mean the pupil's attainment was below a threshold at which they could be assigned a scaled score,[37] which would then be correlated with lower KS1 attainment.

Removing the KS1 baseline and CU area variables from the primary analysis only slightly alters the primary analysis impact estimates for both maths (effect size: -0.09; 95% CI: -0.21 to 0.02) and reading (effect size: -0.13; 95% CI: -0.23 to -0.03), shifting them in a slightly more negative direction. However, the result for maths is still not statistically significant (see Table 17). The further missing data analyses that add FSM status, school FSM proportion, and school type variables to the primary analysis models do not greatly alter the primary analysis estimates, for either the maths (effect size: -0.05; 95% CI: -0.15 to 0.06) or reading outcomes (effect size: -0.08; 95% CI: -0.16 to 0.00). However, the inclusion of these covariates makes the result for reading not statistically significant (see Table 17). We should therefore, be cautious in interpreting the negative result in the primary analysis, which can change to include zero in the CI by small changes (e.g. relating to covariates) in this analysis model.

Table 16: Number and percentage of missing values for each variable included in the primary analysis models

Variable	n (%) not missing	n (%) missing
CU area	5,579 (100.0)	0 (0.0)
Intervention indicator	5,579 (100.0)	0 (0.0)
KS1 maths outcome	5,418 (97.1)	161 (2.9)
KS1 reading outcome	5,416 (97.1)	163 (2.9)
KS2 maths score	5,410 (97.0)	169 (3.0)
KS2 reading score	5,396 (96.7)	183 (3.3)

Table 17: Sensitivity of the primary analysis models to removal or addition of variables that are potentially associated with missingness in the model outcome

Outcome	Predictors included in model	Effect size (95% CI)	Bonferroni corrected p-value
KS2 maths score	Intervention indicator only	-0.09 (-0.21, 0.02)	0.240
KS2 reading score	Intervention indicator only	-0.13 (-0.23, -0.03)	0.046
KS2 maths score	Intervention indicator, CU area, KS1 maths outcome, FSM status, school FSM %, school type	-0.05 (-0.15, 0.06)	0.762
KS2 reading score	Intervention indicator, CU area, KS1 reading outcome, FSM status, school FSM %, school type	-0.08 (-0.16, 0.00)	0.090

Subgroup analysis

The impact of the intervention in the subgroup of FSM-eligible pupils is almost exactly zero for KS2 maths and the CI range includes positive and negative impacts, as it did for the wider population of pupils. See Table 18 (effect size: 0.00; 95% CI: -0.12 to 0.13). The estimated impact for KS2 reading in the FSM subgroup is negative but the CI range includes positive and negative impacts (effect size: -0.09; 95% CI: -0.19 to 0.02). While the point estimate for reading is negative (-0.09), the uncertainty around the effect size means we are unable to conclude that this effect is non-zero.

[37] This description of how scaled scores are calculated implies very low raw marks are not converted into a scaled score: https://www.gov.uk/guidance/understanding-scaled-scores-at-key-stage-2#:~:text=The%20lowest%20scaled%20score%20that,expected%20standard%20in%20the%20test. A small number of pupils with missing KS2 reading scaled scores did have a very low raw reading mark recorded on the NPD. However, for the majority of pupils in this trial with a missing KS2 scaled score, the corresponding raw score ('KS2_MATMARK' or 'KS2_READMRK') was also missing, so the reason for their missing scaled score remains unclear.

Table 18: Impact of Children's University on KS2 attainment in the subgroup of FSM-eligible pupils

	Unadjusted means				Effect size		
	Intervention group		Control group				
Outcome	n (missing)	Mean (95% CI)	n (missing)	Mean (95% CI)	Total n (intervention; control)	Effect size (95% CI)	Bonferroni corrected p-value
KS2 maths score	803	101.6 (101.1, 102.2)	772	102.1 (101.6, 102.7)	1,575 (803; 772)	0.00 (-0.12, 0.13)	1.000
KS2 reading score	801	102.5 (101.9, 103)	767	103.6 (103.1, 104.2)	1,568 (801; 767)	-0.09 (-0.19, 0.02)	0.251

Both these estimates obtained from the FSM subgroup are similar to the corresponding estimates obtained from the interaction models (summing the intervention and 'FSM × Intervention' indicators, see Table 19). Using an interaction model, we found no evidence to suggest a differential impact of the Children's University programme for FSM-eligible pupils compared to non-FSM pupils: the interaction terms representing this differential impact are close to zero and the CIs straddle zero for both KS2 outcomes.

Table 19: Differential impact of Children's University on KS2 attainment in the subgroup of FSM-eligible pupils

		FSM × intervention (differential impact of Children's University for FSM pupils)		Intervention + FSM × intervention (impact in the FSM subgroup)	
Outcome	Total n (missing)	Effect size (95% CI)	Bonferroni corrected p-value	Effect size (95% CI)	Bonferroni corrected p-value
KS2 maths score	5,266 (313)	0.02 (-0.06, 0.10)	1.000	-0.02 (-0.14, 0.09)	1.000
KS2 reading score	5,250 (329)	-0.01 (-0.10, 0.08)	1.000	-0.09 (-0.20, 0.01)	0.126

Analysis of exploratory outcomes

Table 20: Impact of the intervention on the exploratory (non-cognitive) outcomes

	Unadjusted means				Effect size		
	Intervention group		Control group				
Outcome	n (missing)	Mean (95% CI)	n (missing)	Mean (95% CI)	Total n (intervention; control)	Effect size (95% CI)	P-value
Self-esteem	2,109 (646)	11.1 (11.1, 11.2)	2,107 (717)	11.2 (11.1, 11.3)	4,216 (2,109; 2,107)	-0.02 (-0.07, 0.03)	0.511
Goals and aspirations	2,201 (554)	8.0 (7.9, 8.1)	2,184 (640)	8.1 (8.0, 8.2)	4,385 (2,201; 2,184)	-0.05 (-0.12, 0.02)	0.167
Problem-solving	2,182 (573)	10.0 (9.9, 10.1)	2,181 (643)	10.0 (9.9, 10.2)	4,363 (2,182; 2,181)	-0.01 (-0.11, 0.08)	0.781
Fear of communication	2,034 (721)	24.7 (24.4, 24.9)	2,002 (822)	24.8 (24.5, 25.0)	4,036 (2,034; 2,002)	0.00 (-0.09, 0.08)	0.930

The estimated impact of the Children's University programme on the exploratory non-cognitive outcomes in this evaluation can be seen above in Table 20. These results are similar both to each other and to those in the secondary analysis section: impacts close to zero observed in the data, consistent with a range of small positive or negative impacts. This means we found no evidence of an effect of the intervention on any of these exploratory non-cognitive outcomes. The outcomes described here have been classified as exploratory due to low reliability in the baseline data ('Self-esteem', 'Goals and aspirations') or because they do not directly measure the given construct, but only the pupil's perception of it ('Problem-solving', 'Fear of communication'). These methodological limitations may have contributed to the small effect sizes observed. However, there has consistently been no relationship found between the intervention and the non-cognitive outcomes (whether secondary or exploratory) in this evaluation, indicating that the results for the exploratory outcomes are most easily explained by the intervention having no impact on these outcomes.

Association between secondary outcomes and attainment

When we analysed the association of primary and secondary outcomes for the intervention pupils only, the endpoint measurements of both 'Engagement' and 'Valuing of school' show a clear positive association with KS2 maths and reading attainment (see Table 21). The data is only consistent with a range of positive values. As the 'outcome' of KS2 attainment was measured before the endpoint non-cognitive measures were collected, these results cannot be interpreted as precise causal estimates. As this is an association and not a causal impact, it means those with higher attainment in general (not as a result of the Children's University programme) may be more likely to be engaged with and value school. And similarly, those who are engaged with and value school more may be more likely to be high attainers. Nonetheless, they may indicate support for the part of the logic model that posits that higher 'Engagement' and 'Valuing of school' could lead to improved attainment at KS2 (or at least that there is a relationship between these constructs). This means, there is a potential route to achieving higher attainment by exploring activities that support pupils' engagement with and valuing of school. It is worth noting that the methods used here only assess a specific part of the logic model and do not measure the impact of Children's University itself.

Table 21: Association between the primary outcomes (attainment) and secondary outcomes (non-cognitive)

Outcome	Predictor (measured at endpoint)	Total n (missing)	Estimate (95% CI)	Bonferroni corrected p-value
KS2 maths score	'Engagement'	2,154 (601)	0.22 (0.16, 0.28)	<0.001
KS2 reading score	'Engagement'	2,146 (609)	0.21 (0.14, 0.28)	<0.001
KS2 maths score	'Valuing of school'	2,166 (589)	0.21 (0.14, 0.28)	<0.001
KS2 reading score	'Valuing of school'	2,158 (597)	0.19 (0.12, 0.27)	<0.001

Participation in different types of CU activities

The association between the number of hours spent on each category of CU activity and KS2 attainment is shown below in Table 22, for volunteered pupils from intervention schools that took part in at least one CU activity. Activities that might be expected to show an association due to their natural overlap with the subject content of a KS2 outcome (e.g. 'STEM' with KS2 maths, 'Literacy' with KS2 reading), show no evidence of doing so here. There are a few estimates that are distinguishable from zero (lower p-values). The activity type that shows perhaps an interesting positive association is 'Online' for both maths and reading, with models suggesting that maths scores increase by 1 point for roughly every nine hours spent on these activities (every ten hours per point of reading score). We note that 'Online' does not necessarily denote the 'type' of activity as per the other more 'subject' oriented categories. However, on closer examination of the 'Online' category, these were most commonly educational online activities such as tutoring, coding, and other educational online games. The results from these analyses should be interpreted cautiously due to the large amount of statistical tests conducted and p-values were not corrected for multiple testing. Additionally, associations do not reflect the causal impact of participation in a type of activity, as this analysis only involves intervention data and the

degree of this participation was not randomised.[38] Overall, the only analysis here that shows some degree of association with KS2 attainment is the 'Online' activities. Apart from this, we found no evidence of an association between the different CU activity types and pupils' attainment.

For the models investigating the impact of 'many' or 'diverse' activities, the indictor for 'many' activities was determined by whether a pupil took part in more than the median number different CU activities per pupil observed in the data, which was six. The indicator for participation in 'diverse' activities was determined by whether the number of distinct category types[39] for the pupil's CU activities was higher than the median in the data, which was seven. The estimated association between these indicators (as well as the interaction between them) and KS2 attainment can be seen in Table 23. We found no evidence of an association between these indicators and either KS2 maths or readings outcomes; the data is consistent with a wide range of positive and negative associations. We note that the measure for 'diverse' activities is one of many ways we can measure the range of exposure children have had in different activity categories by taking part in CU activities and the limitation of this approach is that it places less weight on the number of activities and more on the number of categories.

[38] Although as hours of every activity type are included simultaneously in multivariate regressions, estimates are adjusted for the correlation between hours spent on different activities.
[39] Recalling that these are the same 16 category types seen in Table 22 and that up to four types can be assigned to one activity.

Table 22: Association between hours spent on CU activities in each category and attainment at KS2. All 16 activity categories were included simultaneously in two multivariate models (maths and reading outcomes)

Outcome	Total n (missing)	Predictor: hours spent on CU activities in the given category	Estimate (95% CI)	P-value
KS2 maths score	1,917 (88)	Arts, culture, and music	0.010 (0.001, 0.020)	0.037
		Careers and enterprise	-0.009 (-0.034, 0.016)	0.471
		Family learning	0.003 (-0.017, 0.022)	0.772
		Sports and physical	0.012 (0.002, 0.021)	0.018
		Mental health and well-being	-0.014 (-0.025, -0.003)	0.011
		Practical life skills	0.002 (-0.021, 0.024)	0.879
		Outdoor learning	0.001 (-0.015, 0.016)	0.922
		Nature and the environment	-0.004 (-0.036, 0.027)	0.783
		Citizenship	0.002 (-0.041, 0.044)	0.942
		STEM	-0.009 (-0.027, 0.009)	0.340
		Languages	-0.015 (-0.051, 0.020)	0.403
		History and heritage	0.007 (-0.035, 0.049)	0.740
		Online	0.119 (0.052, 0.186)	0.001
		Social and community action	0.002 (-0.03, 0.034)	0.907
		Literacy	-0.020 (-0.059, 0.020)	0.323
		Uniformed groups	0.027 (-0.014, 0.068)	0.193
KS2 reading score	1,915 (90)	Arts, culture, and music	0.010 (-0.001, 0.021)	0.075
		Careers and enterprise	-0.011 (-0.039, 0.016)	0.414
		Family learning	0.007 (-0.014, 0.028)	0.527
		Sports and physical	0.001 (-0.010, 0.012)	0.842
		Mental health and well-being	-0.009 (-0.021, 0.003)	0.151
		Practical life skills	0.013 (-0.011, 0.037)	0.292
		Outdoor learning	0.014 (-0.003, 0.032)	0.110
		Nature and the environment	-0.012 (-0.046, 0.022)	0.487
		Citizenship	0.018 (-0.028, 0.063)	0.453
		STEM	-0.026 (-0.046, -0.005)	0.014
		Languages	-0.027 (-0.066, 0.012)	0.178
		History and heritage	0.020 (-0.025, 0.066)	0.377
		Online	0.097 (0.022, 0.171)	0.011
		Social and community action	-0.009 (-0.044, 0.027)	0.63
		Literacy	-0.028 (-0.069, 0.013)	0.176
		Uniformed groups	0.064 (0.019, 0.110)	0.005

Table 23: Association between participation in 'many' (more than six different activities) and/or 'diverse' (more than seven categories assigned) CU activities and attainment at KS2. The indicators for 'many' and 'diverse' activities, as well as an interaction between these, were included simultaneously in two multivariate models (maths and reading outcomes)

Outcome	Total n (missing)	Predictor	Effect size (95% CI)	P-value
KS2 maths score	1,917 (88)	Many (more than six) different activities	0.09 (-0.05, 0.24)	0.213
		Diverse (more than seven) activity categories	0.05 (-0.08, 0.18)	0.460
		Interaction term: many different activities × Diverse activity categories	0.01 (-0.18, 0.21)	0.893
KS2 reading score	1,915 (90)	Many (more than six) different activities	-0.02 (-0.19, 0.14)	0.763
		Diverse (more than seven) activity categories	0.02 (-0.13, 0.16)	0.838
		Interaction term: many different activities × Diverse activity categories	0.14 (-0.07, 0.36)	0.184

Items on 'Future life and aspirations'

Table 24: Responses to the pupil endpoint survey question: 'At the moment, young people can leave school at 18. What would you most like to do when you are 18? (single response only)'

Response option	Intervention n (%)	Control n (%)	Chi-squared test p-value
Get a (full-time) job	320 (14)	304 (13)	0.492
Study at university	574 (25)	608 (27)	0.292
Get a job and study at the same time	695 (31)	687 (30)	0.769
Do something else	225 (10)	284 (12)	0.007
Not sure	389 (17)	330 (14)	0.016

A total of 4,416 pupils (2,203 intervention, 2,213 control) responded to this question. A total of 137 pupils (70 intervention, 67 control) that returned the pupil endpoint survey did not respond to this question.

When asked what pupils most wanted to do at aged 18, the proportion of pupils that selected each option was generally similar in the intervention and control groups, although a slightly higher proportion of control pupils wanted to do something else other than study or work (12% vs 10%, see Table 24). When we looked at the free-text responses indicating what this 'something else' was, there was no indication of a difference between the intervention and control groups, in terms of the frequency of codes assigned to the pupil free-text responses.

Table 25: Responses to the pupil endpoint survey question: 'Thinking about your own future, please order these statements to show which one is most important (1) to which one is least important (7) to you.'

Response option	Intervention median (IQR) rank	Control median (IQR) rank	Mann-Whitney U test p-value
Getting good grades at school	3 (2, 5)	3 (2, 5.5)	0.049
Going to university after finishing school	5 (3, 7)	5 (3, 7)	0.414
Finding a job	4 (3, 5)	4 (3, 5)	0.860
Having enough money	4 (3, 6)	4 (3, 6)	0.803
Buying a house	6 (4, 7)	6 (4, 7)	0.671
That I am happy	2 (2, 5)	2 (1, 5)	0.099
That I am healthy	2 (1, 4)	2 (1, 4)	0.831

A total of 4,045 pupils (1,998 intervention, 2,047 control) gave a valid response to this question. A total of 275 intervention and 233 control pupils that returned the endpoint pupil survey either did not respond to this question or gave an invalid response (e.g. did not assign a rank to every option) so did not contribute to these statistics. IQR, interquartile range.

For the question asking pupils to rank what was most important in their future, 'being healthy' and 'being happy' had the highest average rank among the options presented (median rank of 2). There was little evidence of any differences in the ranked importance of each option between the intervention and control groups (Table 25).

Estimation of ICC

The ICC from models with no predictors (unconditional) and the ICC from the primary analysis models (conditional on predictors) are shown below in Table 26.

Table 26: Terms used in the calculation of the unconditional and conditional ICC for the primary outcomes

	Unconditional ICC			Conditional ICC		
Outcome	Between-school variance σ_ζ^2	Within-school variance σ_{error}^2	ICC	Between-school variance σ_ζ^2	Within-school variance σ_{error}^2	ICC
KS2 maths score	6.35	52.70	0.11	5.16	26.46	0.16
KS2 reading score	4.78	55.90	0.08	2.68	32.99	0.08

Implementation and process evaluation results

Usual practice at baseline

Schools and their pupils took part in Children's University from January 2022 to July 2023. To understand usual practice, all schools (treatment and control) completed a business as usual (BaU) survey at baseline (September 2021) to help the research team understand their extracurricular offer in the year prior to the trial commencing (2020/2021 academic year). The baseline pupil survey[40] provided an understanding of pupils' own participation in extracurricular activities ahead of the trial commencing. Given that this most recent academic year had been impacted by the Covid-19 pandemic, schools indicated how this offer compared to that of pre-pandemic academic years. Schools also provided details on their plans for delivering extracurricular activities during the trial.

IPE_RQ6: What was Business as Usual (BaU)? We explored this in 2020/2021 and pre-pandemic

- Most schools offered between one and four different extracurricular activities in 2020/2021, generally across one to three activity types—the most common being sports/games, performing arts, and academic activities. Most of these activities took place once a week.
- In 2020/2021 schools reported offering fewer activities compared to the past due to ongoing Covid-19 restrictions but intended to increase their offer the following year (the first year of the trial).
- Most activities were delivered after school, on school premises and by school staff.

IPE_RQ6: And what extracurricular participation is usual for pupils in the intervention and control groups?

- Just over half of pupils (56%) reported usually participating in at least one activity in school. Out-of-school activities were slightly more common (reported by 63%). Sports and games (48%) and performance/arts activities (16%) were the most common type of activities that pupils reported.
- Over half of pupils (59%) reported that they would like to participate in more activities. This was slightly more common among pupils in intervention schools (61%) than pupils in control schools (57%). Nearly two-thirds (63%) of pupils who reported participating in at least one activity reported receiving awards or celebrations for their participation, and a similar proportion considered this to be important (62%).

What extracurricular activities were available in schools at baseline?

Very little difference was observed between intervention and control schools in relation to extracurricular provision in the 2020/2021 academic year. Close to three-quarters (73%) of all schools who completed the baseline BaU survey reported that they had offered extracurricular activities to pupils in upper KS2 in the 2020/2021 academic year (i.e. the year prior to the intervention).[41] Nearly all schools indicated that the ongoing Covid-19 restrictions had resulted in fewer extracurricular activities being on offer compared to previous years.

In the 2020/2021 academic year, most schools offered between one and four activities, most commonly across one to three different activity types.[42] Activities were most commonly sports/games, performing arts, or academic clubs, which were delivered after school, on school premises, or by school staff. Activities were most commonly open to 11–20 KS2 pupils.

What extracurricular activities did schools plan to deliver over the trial period?

Almost all schools planned to offer extracurricular activities to upper KS2 pupils in the 2021/2022 academic year. There was the intention to offer more activities in the 2021/2022 academic year (i.e. the first year of the trial), compared to the academic year before the trial (2020/2021), with most schools planning to offer four or more different activities, most commonly across three or four activity types. Most schools also reported that their offer of extracurricular activities would be similar to, or greater than, what they offered in the academic years before the pandemic.

[40] N.B. Unless otherwise indicated, all quantities relating to pupil surveys in the IPE results refer to pupils who completed the baseline survey and volunteered to participate in Children's University prior to randomisation (referred to as 'volunteer pupils').
[41] This includes three schools that indicated they provided extracurricular activities but did not list any when requested.
[42] Activities reported by schools were grouped into a range of 'types' by NFER researchers—see Appendix L for a full list.

Schools' planned offer for the 2021/2022 academic year was very similar to that in the 2020/2021 academic year. Sports/games, performing arts, and academic-based clubs were most common. Again, most clubs were planned to take place after school, on school premises, and be delivered by school staff to groups of 11–20 pupils.

To what extent were pupils participating in extracurricular activities at baseline?

There was very little difference at baseline in pupils' participation in extracurricular activities between those in intervention schools and those in control schools. Just over half of all pupils (56%) reported at baseline that they participated in at least one in-school extracurricular activity, while a slightly higher proportion (63%) reported that they took part in at least one activity outside of school. Most of these activities took place once a week (72% for in-school, 66% for out-of-school).

In line with findings from the BaU school survey, the pupil survey at baseline indicated that sports and games were the most common type of activity, making up nearly half (48%) of the clubs that pupils participated in at school and nearly two-thirds (63%) of out-of-school activities. Performing arts/drama were the second most common type of in-school activity (16%) and out-of-school activity (9%). Most of the clubs that pupils participated in took place once a week (72% of in-school and 66% of out-of-school clubs). However, out-of-school clubs were more likely than in-school clubs to take place more than once a week (28% compared to 18%).

Over half of pupils (57% of control and 61% of intervention group pupils) reported that they would like to participate in more activities, particularly computing/information and communication technology (ICT), arts and crafts, cookery, or physical education (PE)/sport.

Did pupils in upper KS2 receive any awards or celebrations for their achievements in extracurricular activities?

Of those pupils who reported doing at least one extracurricular activity, nearly two-thirds (63%) reported receiving awards or celebrations for doing so, and a similar proportion (62%) considered this to be important. Across the sample as a whole (including pupils who did not report doing any activities), a slightly higher proportion of pupils in intervention schools considered awards and celebrations for extracurricular activities to be important (57%), compared to pupils in control schools (51%).
Overall, these findings suggest few differences in schools' extracurricular provision and pupils' participation in extracurricular clubs and activities between the control and intervention 'groups'[43] at baseline.

Compliance and responsiveness

In seeking to understand compliance and pupil responsiveness to Children's University, the evaluation team conducted analysis of pupil-level CUO data to understand the extent of pupils' participation, the activities in which they participated and the graduation award levels they achieved. Data from interviews with local CU Managers, the Children's University Trust, school staff and pupils, and endpoint surveys of school CU Coordinators and pupils, also provide insights into levels of compliance with the intervention, as well as how schools and pupils engaged with and responded to Children's University.

IPE_RQ2: What was the extent of pupil participation?

- Three-quarters (77%) of volunteer pupils recorded activity on CUO.
- There was a large range in the number of Childen's University-validated activities per pupil (1 to 79 activities), with a median of 6 (excluding pupils who recorded 0 hours). However, nearly a third of pupils recorded time to more than ten activities.
- The median number of activity hours recorded per pupil was 17 overall, but 34 excluding the 23% pupils who entered 0 hours, with an IQR of 8 to 84 hours.
- Close to two-thirds of pupils represented on CUO were recorded as having earnt a Children's University award, with Bronze (30 hours of activities) being the most common. However, most of the third of pupils who used CUO but did not receive a reward recorded fewer than ten hours of activities.

[43] N.B. See footnote 25.

- Pupils eligible for FSM recorded notably fewer hours of activities on CUO compared to their peers (median of 26.5 hours compared to 37.5), resulting in nearly half (46%) of FSM pupils who recorded activities on CUO not being eligible for any awards over the course of the trial (compared to 38% of those not eligible for FSM).

IPE_RQ2: Which types of activities did children take part in, and how often?

- 'Sports and physical' activities (12%), and 'Arts, culture, and music' activities (12%) were the types of activities most commonly recorded on CUO.
- 'Practical life skills' (10%) and 'Mental health and well-being' (10%) were the next most common types of activities recorded.

IPE_RQ2: How many children graduated? And which children?

- Nearly two-thirds (60%) of pupils who recorded activities on CUO were eligible for graduation (i.e. they were eligible for a Bronze award or above). However, less than half (43%) reported at endpoint that they had or would attend a graduation ceremony at the end of Year 6.

To what extent did pupils who volunteered to participate in Children's University engage with the programme?

Proportion of volunteer pupils

Of the 2,755 intervention volunteer pupils, 2,132 (77%) recorded activity hours on CUO. A smaller proportion of pupils (68%) reported at endline that they had taken part. This may be a consequence of attrition from the data collection among pupils who had recorded activities on CUO, or a lack of awareness among certain pupils that what the survey was asking aligned with the recording of activities on CUO.

Just under a quarter of volunteer pupils (23%) did not record any activities on CUO. This is likely in part due to four of the 81 intervention schools (5%) not having engaged with CUO at all, as well as pupils in other schools choosing not to record their hours, not being able/supported to do so and/or not participating in CU-validated activities, as was reported by school staff.

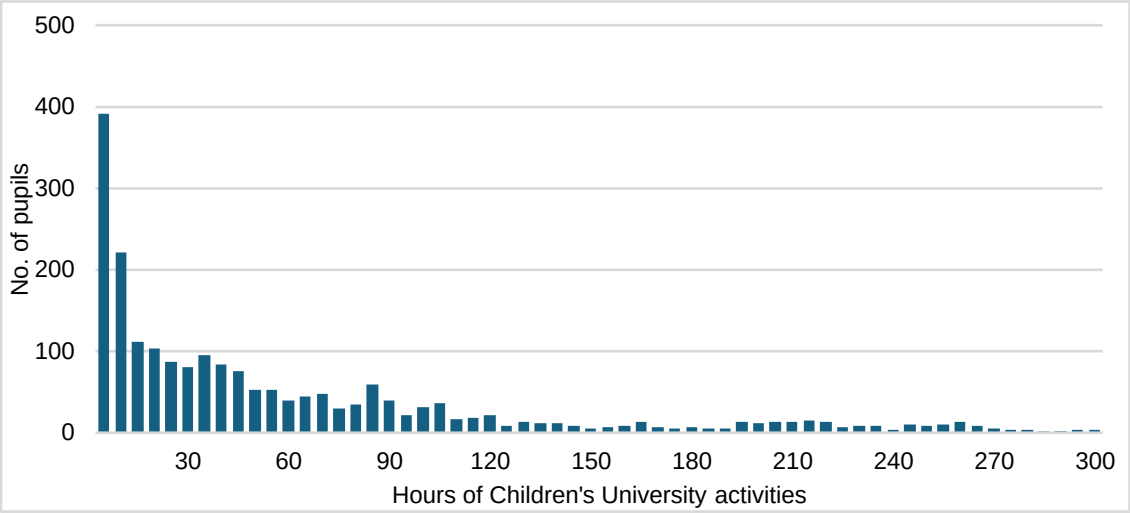
Half (48%) of pupils who did not initially volunteer (i.e. those in Year 5 in 2021/2022, Year 6 in 2022/2023 in the intervention schools, classified in this trial as 'non-volunteers') also reported having taken part. As per the protocol, these pupils were not measured as part of the trial, but may have received CU Passports and were able to take part in CU activities where local funding outside of the trial allowed.

Number of hours recorded to activities

As discussed under the 'Impact: Outcomes and analysis' section, less than half (42%) of pupils in intervention schools recorded 30+ hours of activities on CUO. On average (median),[44] pupils in intervention schools recorded 17 hours of activity in CUO over the five terms of the programme. However, excluding the 23% of pupils in intervention schools who did not appear on CUO, the median was 34 hours of activity [IQR = 8–84], with a range (per pupil) extending from 0.5 to 1,198 hours.[45] This is represented in Figure 6, with extreme outliers (>300 hours) removed from the figure to support readability. Pupils who did not record any activities on CUO are also excluded from these figures. Due to the delays resulting from Covid-19, pupils were only able to participate in CU activities for two terms in the first year of the trial. Several local CU managers noted that this resulted in fewer pupils graduating and/or lower award levels compared to what they would see in a usual year without the constraints of the pandemic and when children would have all three terms to accumulate hours. We discuss contextual challenges to implementation further under the section 'Moderators and context'.

[44] Due to the undue influence of some significant outliers on the mean, the median is reported throughout.
[45] Outliers at the upper end of this range are likely to be inaccurate recordings.

Figure 6: Number of activity hours recorded on CUO per pupil over the whole trial period



Notes: Data from CUO (n=2,132 pupils). Each bar represents a range of five hours. Please note that pupils who did not record any hours are not included in this dataset. Pupils with 300+ hours recorded (n=37) are not included to improve plot readability.

Number of activities

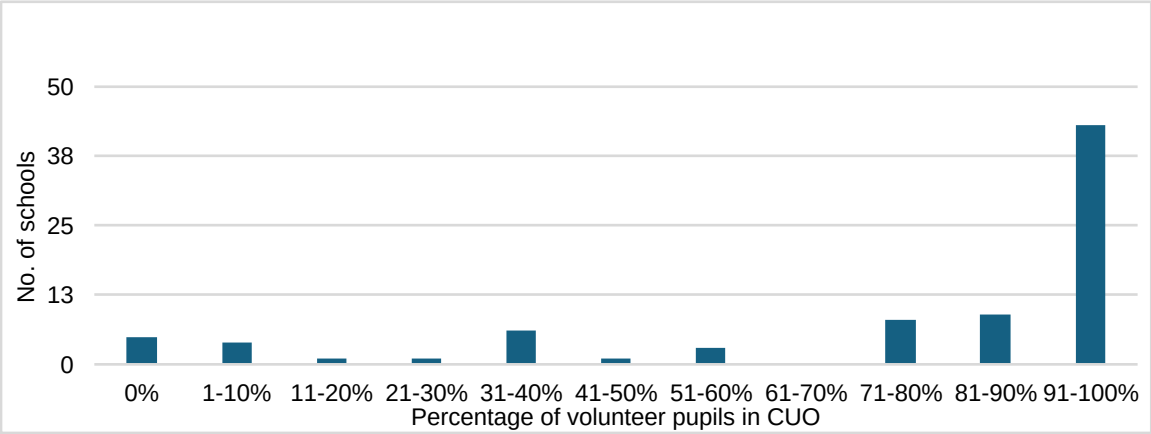
On average (median), pupils recorded six different CU-validated activities on CUO [IQR = 3–13], however the total range of activities, which pupils participated in extended from 1 to 79 (this higher end is likely to be a recording error). A third (31%) of pupils recorded more than ten.

Range of activity types

Volunteer pupils were recorded to have participated in between 1 and 16 different types of activities.[46] The largest proportion of pupils (10%) participated in six different activity types. Just less than two-fifths (38%) of pupils participated in ten or more different types of activity.

School staff reported that pupils responded to Children's University with enthusiasm and had enjoyed being involved in the programme. This aligns with the local CU Manager perception that, where schools engaged, most pupils tended to participate—albeit to varying extents. However, CU Managers also reported some schools with smaller proportions of participating pupils. These reports align with the CUO trends of the proportion of volunteer pupils who recorded activity per school, as represented in Figure 7.

Figure 7: Proportion of volunteer pupils for whom activities were recorded on CUO per school



Notes: Data from CUO (n=81 intervention schools).

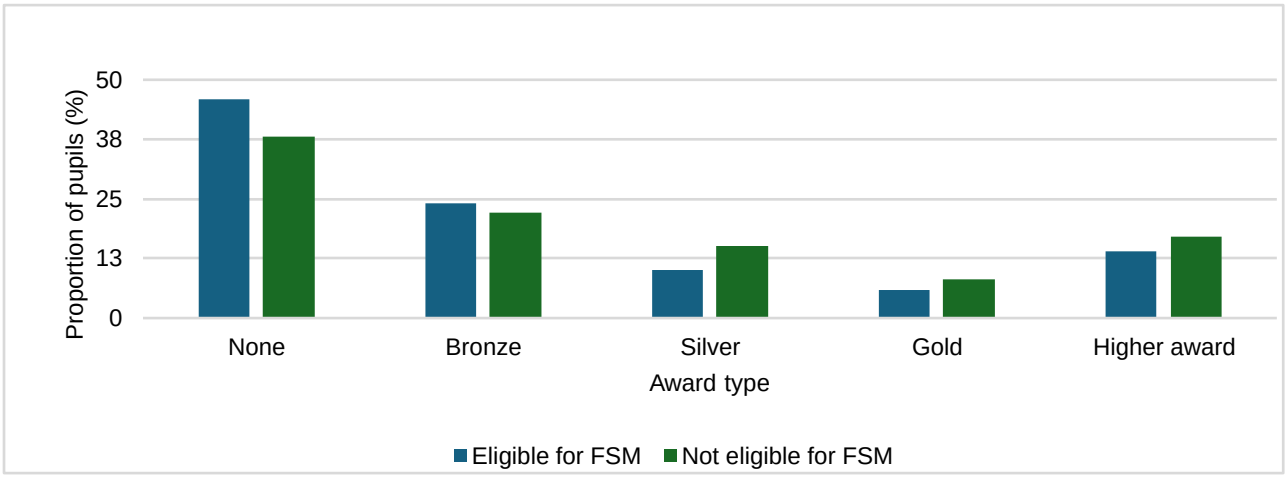
[46] Categories for activity type here are those used in CUO.

Interviewees reported that, where pupils did not participate in Children's University, this was because they were not interested in the programme, were participating in school activities or clubs that are available to all pupils but choosing not to record their hours on CUO, and/or received limited parental support to engage. This final point was specifically reported to be an issue for more disadvantaged pupils and was seen as part of an ongoing challenge of engaging these parents in school life, although a greater number of CU Coordinators in more deprived schools (5 out of 28) reported that 'all' volunteer pupils had taken part in the programme, compared to CU Coordinators in less deprived schools (2 out of 33).[47] Pupil participation did not otherwise appear to differ notably by school-level FSM.

To what extent did disadvantaged pupils engage with Children's University?

Of all volunteered pupils in intervention schools, 31% were eligible for FSM. This compares to 30% of children eligible for FSM nationally.[48] Pupils eligible for FSM recorded a slightly lower number and range of activities on CUO compared to their peers (median of six and seven activities, respectively). They also reported notably fewer *hours*, with a median of 26.5 compared to a median of 37.5 among their non-FSM peers. Accordingly, they were also more likely *not* to have become eligible for an award during the trial period (46% compared to 38%). Where pupils did receive an award, the proportion of pupils who attained Bronze as their highest award level over the course of the trial was higher among those eligible for FSM, while the reverse trend emerged in the higher award levels—as shown in Figure 8. Moreover, a higher proportion of pupils eligible for FSM participating in the trial recorded no CU activities (26%) compared to their non-eligible peers (21%) ($p<0.01$).

Figure 8: Highest award level attained during trial disaggregated by FSM status[49]



Notes: Data from pupil-level CUO records (n=2,132, 629 of which were eligible for FSM).

What activities did pupils take part in?

The most common types of activities that pupils recorded on CUO fell within the 'Sports and physical', and 'Arts, culture, and music' categories (each making up 12% of all hours recorded on CUO), followed by 'Mental health and well-being' and 'Practical life skills' (each making up 10% of all activities). This data covered both in-school and out-of-school activities. While these activities did not provide academic learning opportunities relating to maths and reading specifically, the Theory of Change predicted that change in academic outcomes would occur via the mediation of improved non-cognitive outcomes as a result of these extracurricular activities.

The endpoint pupil survey indicated quite different proportions, however, with sports and games making up more than half (54%) of the in-school activities and nearly two-thirds (62%) of the out-of-school activities reported. Visual and performing arts were the next most common activity type in both cases (17% of in-school, 14% of out-of-school), equalled by academic activities for in-school (17%) and closely followed by outdoor activities for out-of-school (12%).

[47] Throughout IPE sections, schools in the highest 40% of proportion of FSM pupils at a national level are referred to as 'more deprived', while those in the lowest 60% of proportion of FSM pupils are referred to as 'less deprived'.
[48] In 2022/2023 the proportion of everFSM6 pupils in England among Year 6 was 30%, see: https://explore-education-statistics.service.gov.uk/data-tables/permalink/958fbdfc-f91a-4fc5-9737-08dd091dff7c.
[49] N.B. The 'Bronze', 'Silver,' and 'Gold' categories represented in the figure are all at the undergraduate level. The 'Higher award' category covers postgraduate awards and above. The full list of awards can be found in Appendix M.

This suggests that pupils were taking part in other extracurricular activities that were not part of CU (this is plausible with e.g. sports activities, which many children do as part of their usual activities both within- and out-of-school), and/or had not been validated and/or recorded on CUO. It is also likely that in the survey, pupils may not have thought to report some of the activities that were recorded on CUO, such as challenge sheets, museum visits, and school residentials.

Focus groups with pupils in case study schools gave an insight into the specific activities they were participating in, with pupils saying they had engaged with sports, STEM, music, history, arts, life skills, scouts,, and guides and had earnt stamps for the school trips (such as to universities, museums, theatres, and historic sites) and residentials they had attended.

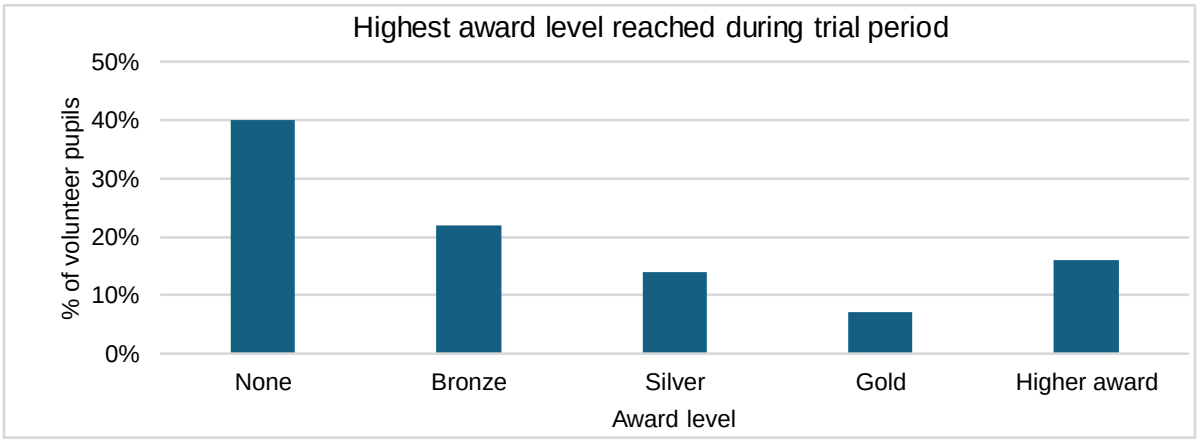
Local CU Managers also highlighted some differences in the types of activities that pupils were involved in between the first and second year of the trial, with residentials and class trips, Standardised Assessment Tests (SATs) booster groups, inter-school competitions, and tournaments all cited as being more common when participating pupils were in Year 6, compared to Year 5.

What proportion of pupils were eligible for an award for their participation in Children's University?

CUO allows award levels attained to be entered independently of the number of hours recorded. According to the award-level data field, nearly two-thirds (60%) of pupils who recorded activities on CUO were eligible for an award. Of these pupils, just over a third (38%) achieved Bronze (30 hours) as the highest award level, followed by award levels above Gold (130 hours, 27%), then Silver (65 hours, 23%), and Gold (100 hours, 12%) (see Figure 9 below). This reflects the large amount of variation observed in levels of pupil participation. The prevalence of Bronze awards aligned with reports from school staff and CU Managers - with the latter indicating that this was to be expected from the limited timeframe of the trial. However, while CUO reported that awards higher than Gold were the next most common interview data from local CU Managers and schools suggests that these were rare. As noted above, prize eligibility was recorded on CUO separately to the number of hours completed, and the two did not always align, suggesting some potential inaccuracies of the CUO system (see 'Fidelity and adaptation' section below).

A smaller proportion of disadvantaged pupils were eligible for an award compared to their more affluent peers (54% compared to 62%).

Figure 9: Highest graduation award recorded per volunteer pupil on CUO



Notes: Data from pupil-level CUO records (n=2,132). 'None' refers to the corresponding CUO record, not an absence of data.

Fidelity and adaptation

Findings from the IPE data collected from this trial suggest that there was a high level of variation in the extent to which Children's University was delivered with fidelity to the programme's design and intentions.

The nature of the Children's University model means that how local CUs operate differs depending on their organisation type and funding models, number and type of schools engaged with their local CU and local CU staffing capacity. At the local CU level, CU Managers reported providing trial schools with their usual offer, meaning schools received the same experience and opportunities as they would do outside of the trial under the same conditions (in the context of the Covid-

19 pandemic in this case). It is worth noting however, that the provision of and participation in both in-school and out-of-school activities was significantly reduced during and immediately following the Covid-19 pandemic.

IPE_RQ1: To what extent was the programme implemented as intended? Were the training sessions, information sessions, validation of activities, access to passports and CUO, and graduations implemented as intended?

IPE_RQ3: Were there any adaptations and why?

- Training sessions: most schools reported having a staff member attend the training at the start of the programme. Refresher sessions in the second year were much less common, and subject to the judgement of both the CU Manager and the school around whether it would be helpful and the form it would take. Most schools also reported attending training for CUO.
- Information sessions: three-quarters of schools reported receiving a pupil information session from their local CU Manager in the first year of the trial, and less than half in the second. Local CU Managers rarely delivered information sessions for parents, and communication between schools and parents around Children's University appears to have been limited.
- Validation of activities: adaptations to the validation process were widespread, leading to high levels of inconsistency between areas and schools around, which activities were validated and by whom. Validation of local learning destinations was broadly unsuccessful due to challenges around getting destinations to engage.
- Access to passports and CUO: there were high levels of variation in how passports and CUO were used, with this component of the programme appearing to be overall less pupil-led than intended. There were also concerns about the extent to which CUO accurately conveyed the activities children had participated in, potentially due to challenges around validating and recording out-of-school activities.
- Graduations: graduation ceremonies did not take place as intended, with only two-thirds of schools reporting a graduation ceremony at the end of Year 6, and nearly half of these took place in-school.

IPE_RQ1: What range of validated Children's University activities were offered—by schools? In locality? What activities were most common; and what variations were there between local Children's University areas? Were any new activities offered/validated, and why?

- Schools varied in the number and range of activities that they offered as part of Children's University. Just over half of pupils agreed that their school offered 'lots' of CU activities.
- 'Sports and physical' activities and 'Arts, culture, and music' were the types of activities most commonly offered by schools.
- In most local areas, validated activities outside of school were very limited, primarily due to the challenge of engaging providers with the programme.
- A small number of schools reported increasing their extracurricular offer in response to Children's University.

To what extent did the delivery of Children's University staff training sessions and CUO training adhere to the intended approach?

Training sessions for school staff on both the programme and CUO specifically were successfully implemented and highly appreciated in the first year of the trial. However, refresher sessions in the second year of the trial were not as widespread as intended.

It was intended that local CU Managers would provide training to participating schools at the start of each year of the trial (i.e. initial/main training at the start of 2021/2022 then refresher training at the start of 2022/2023). The training would cover, what Children's University is: the role of the local CU Manager and their offer to schools, the role of the school CU Coordinator and how to engage pupils and parents; how to implement the programme in schools; the process of validating activities and awarding stamps; the graduation ceremonies; and the expectations and commitment required from the school.

Most respondents (58 out of 66) to the endpoint CU Coordinator survey reported that they or another colleague had attended the staff training provided by their local CU at the beginning of the trial. However, less than half (26 out of 66) reported the same for the refresher training at the beginning of the 2022/2023 academic year. The reasons for not attending refresher training were split almost equally between not having been offered a session or opting out of one they had been offered.

All local CU Managers reported in the interviews at the end of the 2021/2022 academic year that they had delivered staff training sessions at the beginning of the trial. There was variation in whether these sessions took place in-person and online due to the Covid-19 restrictions that were in place at the time. CU Managers agreed, however, that refresher briefings in the second year of the trial were less common, in large part due to take up but also as a result of CU

Managers focusing on schools that were either the most engaged or required additional support. In some cases, engaged schools opted for refresher training, whereas others felt able to continue without formal training and preferred a more informal 'check-in'. In schools with low engagement in the first year of the trial (2021/2022), some wanted a refresher to build momentum for the second year of the trial, whereas others who were still not engaged in the programme did not take up the offer.
Almost all (48 out of 51) CU Coordinators who had attended a Children's University briefing or training themselves, either at the beginning of the trial or refresher training, agreed or strongly agreed that they were satisfied with the quality of the session. Most (45 out of 51) also agreed or strongly agreed that the briefing/training prepared them for their role as CU Coordinator.

In addition to the training provided by local CU Managers, the Children's University Trust provided schools with an initial training session on using CUO, with follow-up support delivered by local CUs if they felt able to respond to questions and challenges, or escalated to the Children's University Trust for further support or refresher training, which was available to schools throughout the trial.

Most CU Coordinators (55 out of 66) reported that they or another colleague had attended training for CUO, with respondents evenly split in indicating whether this was with the Children's University Trust or their local CU Manager. Almost all CU Coordinators who received CUO training themselves agreed or strongly agreed that they were satisfied with the quality of the session (46 out of 48). Three-quarters of respondents indicated that the training prepared them to use CUO in their school (42 out of 48).

To what extent were Children's University pupil information sessions implemented as intended?

Pupil information sessions were implemented as intended in the first year of the trial, with the exception of a greater proportion taking place online due to Covid-19 restrictions. However, refresher sessions in the second year of the trial did not frequently occur.

It was intended that local CUs would deliver pupil assemblies/information sessions for participating schools in each year of the trial. The assemblies were an opportunity for pupils to learn about Children's University, the types of activities they could participate in (or may have already been doing), to earn stamps and work towards a graduation, and how CUO and the passport systems work.

Local CU Managers reported delivering a mix of in-person and online pupil briefings/assemblies. Some local CU Managers reported that they provided pupils with an activity or challenge immediately after the assembly so pupils could earn their first stamp. In two regions, pupil assemblies were delivered by the schools based on information provided by the local CU. These CU Managers reported providing schools with leaflets, posters, presentations, tips for implementation, and content for their school website and newsletters, such as wording about what Children's University is and frequently asked questions (FAQs). While the CU Managers explained that this was their pre-existing model, to enable schools to tailor the sessions to their pupils' needs, this represents an adaptation from the intended model for the trial.

Around three-quarters (44 out of 66) of CU Coordinators reported via the survey that their pupils had received a briefing/assembly from the local CU at the beginning of the trial. Interview data suggests that Covid-19 restrictions likely played a part in those cases where a pupil briefing was not reported. Less than half (28 out of 66), however, reported having received one at the start of the second year of the trial—when Covid-19 restrictions were no longer in force. Local CU Managers reported that they had delivered refresher pupil assemblies in some (but not all) schools to remind pupils that they were still involved in the programme and what they needed to achieve to attend the graduation in summer 2023. As with the refresher staff training, factors determining school take-up of these sessions included their level of engagement with the programme overall, their interest in having the refresher session, and capacity for the local CU Manager to visit the school to deliver this.

Almost all (48 out of 53) CU Coordinators who reported that their pupils had received a Children's University briefing/assembly at the start of the trial or as a refresher agreed that they were satisfied with the quality of the session. In addition, most (44 out of 53) agreed that the briefing/assembly prepared pupils to participate in Children's University. However, less than half reported having received support from their local CU or Children's University Trust to encourage pupil participation (29 out of 66).

To what extent were parent information sessions delivered as intended?

Local CUs do not appear to have been frequently involved in delivering parent information sessions, and only a small number of schools reported holding these sessions themselves.

Local CU Managers were expected to deliver information sessions to parents as part of the programme set-up phase to help promote and raise awareness among families of the CU activities. However, only a very small number of CU Coordinators (5 out of 66) reported that a parent briefing was held by the local CU ahead of children participating in the programme. Another fifth (13 out of 66) said that one was held but it was delivered by the school. In a small number of regions, local CUs held either in-person or online briefings specifically for parents. One local CU explained that they have a social media page where parents can contact them and ask questions or request codes. However, it was more common for parents to be invited to pupil assemblies or for local CUs and the Children's University Trust to provide schools with information to share with parents, such as signposting them to the Children's University website and social media, sharing information leaflets and newsletters and sending home challenge sheets for parents to support their child to complete. This aligns with findings from the local CU Manager interviews, where it was generally reported that schools preferred to manage parental engagement themselves, including the parent briefings.

Communication about Children's University also appears to have been limited between parents and schools. For example, a review of case study schools' websites revealed that only two (out of six) contained mentions of Children's University, and only one school gave Children's University any kind of prominence in their website content and detailed information about how the programme works (e.g. how pupils can earn stamps and the number of hours required to achieve each of the award levels). Five of the six case study schools did, however, provide information on their broader extracurricular offer on the school website. Furthermore, only a small proportion of CU Coordinators (9 out of 66) reported that they had received support from their local CU or the Children's University Trust to encourage parental engagement. Around half of CU Coordinators (31 out of 66) indicated that they had provided parents with additional information in an effort to encourage and enable pupils from disadvantaged backgrounds to take part in Children's University.

Did the process of validating activities on CUO happen as intended?

Clubs and activities had to be validated on the CUO platform for pupils to be able to earn stamps for them. It was intended that schools would validate their own in-school clubs and activities, that local learning destinations would complete the validation form for activities offered in the area and send this to local CUs or the Children's University Trust to approve, and that local CUs would validate their own activities. The process of validating activities via these methods did not consistently happen as intended.

Although many schools validated their own activities, local CU Managers provided schools with more support with this process than intended. Just over two-thirds (45 out of 66) of school CU Coordinators reported in the survey that they had received support to create activity codes on CUO and validate activities. Moreover, interviews with local CU Managers and school staff identified instances of local CUs carrying out audits of what schools offered and what clubs/activities pupils engaged in outside of school so that codes for these clubs and activities could be created. Several local Children's University managers created posters to be displayed in classrooms detailing these activities and associated CUO code to support pupils when it came to updating their CUO dashboard.

The validation of local learning destinations rarely happened as intended. Interviewees reported that few learning destinations completed the validation form themselves. One local CU created a postcard with information for learning destinations about Children's University and a quick response (QR) code which would take them to the validation form. The postcards were shared across local CUs and given to pupils to take to the clubs and activities they attended outside of school. In a minority of areas where Children's University was well-established, a wide range of local learning destinations were already validated but, in many cases, schools themselves or local CUs had to validate pupils' external clubs and activities to create stamp codes. In some areas, local CU Managers reported that pupils could submit a 'Stamp Appeal' for activities that were not validated but met Children's University criteria. In areas where local CU Managers validated external activities, due to the volume of external clubs and activities pupils could participate in, some Managers reported creating general activity codes, for example 'Swimming', rather than for a specific leisure centre.

These processes were adaptations to intended practice in response to specific barriers, but the lack of consistency across schools or local areas resulted in high variation in the ability of pupils to gain stamps for external clubs and

activities. Moreover, there did not appear to be alignment between local CUs about what kind of activities could or could not be validated in terms of the quality of learning experience they offered.

Local CUs who sourced and provided their own activities validated these activities on CUO as intended.

Were the Children's University passports and CUO implemented and managed as intended?

Use of Children's University passports and CUO was inconsistent between CU areas and schools, with a wide variety of approaches for keeping CUO updated being reported. Pupil ownership of their CUO profile appears to have been relatively limited. Moreover, CUO may not have captured all the CU activities children were participating in (not all children had CUO records); and it may not have captured all out-of-school extracurricular activities as there were challenges engaging local learning providers in the validation process.

It was intended that pupils involved in the trial would receive a 'Passport to Learning' and log-in details for their CUO dashboard, where they would record the activities that they participated in and earn stamps. It was also intended that pupils would take ownership of logging their activities on CUO and responsibility for keeping their own dashboard up to date. However, a large number of adaptations to this process occurred and the management of CUO and the use of passports varied within and across local CUs (see 'Context and moderators' section for further detail).

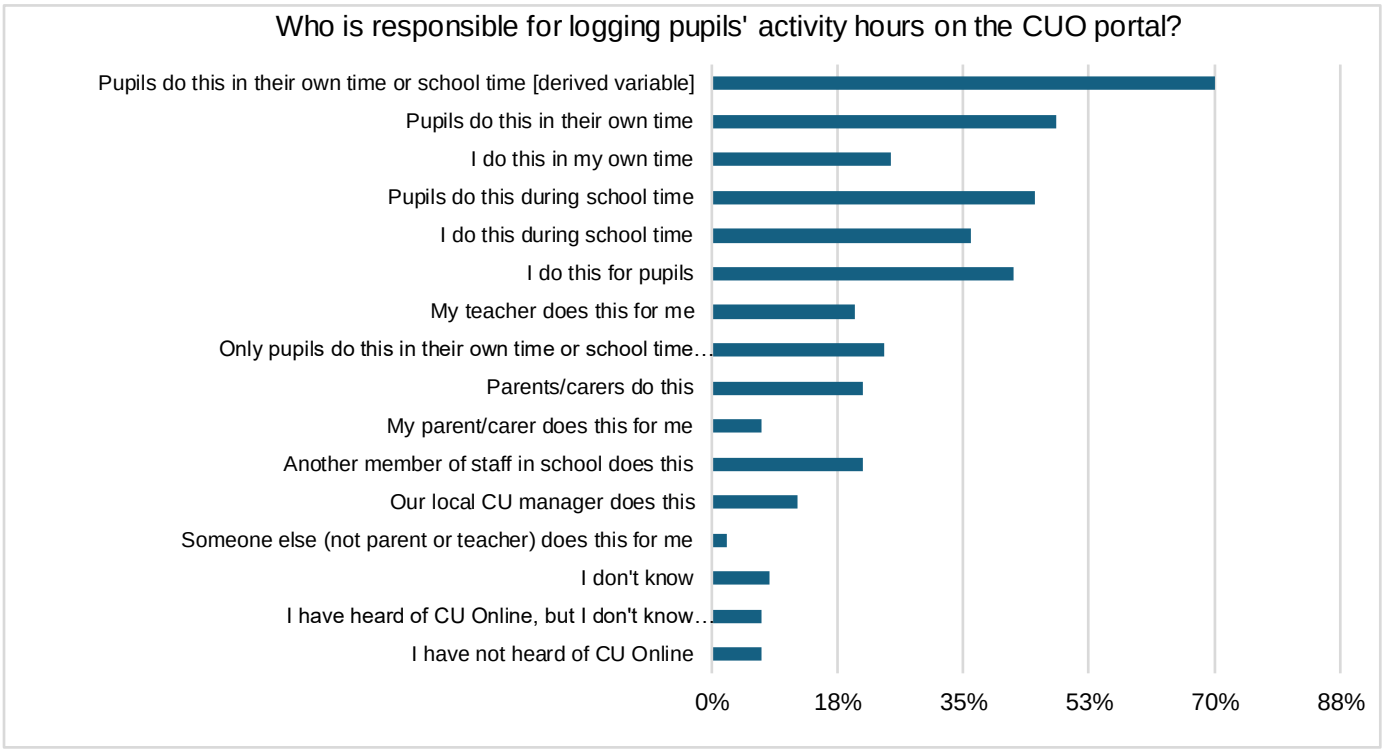
In some regions, local CU Managers, school staff, and pupils in case study schools reported that passports were not being used as CUO was seen to fill their role. In cases where pupils did use passports, local CUs and school staff said pupils were recording their out-of-school activity in these and uploading this to CUO when at school, along with their in-school clubs and activities. Only around a tenth (12%) of pupils indicated in the endpoint pupil survey that they had collected stamps in their passport in addition to or instead of using CUO.

Moreover, only a quarter (16 out of 66) of CU Coordinators reported that pupils were fully responsible for uploading their hours, either during their own or school time. A further half (30 out of 66) of CU Coordinators identified pupils as partially responsible for updating CUO. In the pupil survey, a third (36%) of pupils reported updating CUO during school time, while a quarter (25%) reported doing it outside school time. One in three pupils (30%) did not indicate making any updates to CUO themselves. Where pupils were not updating CUO, a member of staff, parent/carer, or the local CU Manager was reported to be doing so.

A notably higher proportion of CU Coordinators in more deprived schools (9 out of 28) reported pupils taking full responsibility for updating CUO compared to less deprived schools (5 out of 33). However, it was more common in less deprived schools for pupils to update CUO in their own time (18 out of 33, compared to 11 out of 28), whereas in more deprived schools it was more common for them to do so during school time (15 out of 28, compared to 12 out of 33)—potentially indicating information technology (IT) access disparities at home. This is further suggested by notably fewer CU Coordinators in more deprived schools (4 out of 28) indicating that parents/carers updated CUO compared to less deprived schools (10 out of 33).

Figure 10 below combines data from the CU Coordinator and pupil endpoint surveys to illustrate the range of ways in which updates to CUO were made.

Figure 10: Responsibility for logging pupils' activities in CUO



Notes: Data from the endpoint CU Coordinator survey: Who is responsible for logging pupils' activity hours on the CU Online portal? *(n=66) and endpoint pupil survey: Who logs your activities and clubs onto CUO? (n=1,550). Respondents could select more than one response.*

These findings align with local CU Manager, school staff and pupil focus group reports that few pupils were independently uploading their hours to CUO in their own time. Instead, it was seen to be most common for teachers to allocate time during the school day for pupils to update their CUO dashboard. However, some schools did not have the IT facilities and/or internet access to enable this. Aligned with the survey findings, local CU Managers and school staff also reported that it was common for school CU Coordinators or other staff at the school to upload pupils' activities using registers from school clubs and from what pupils had recorded in their passport or told them they had attended outside of school. The Children's University Trust felt that, overall, the use of CUO was not as pupil-led as intended and, where teachers or local CU Managers took responsibility for uploading pupils' hours, pupils missed out on seeing their hours increase (a motivator for continued engagement) and seeing the skills they had gained from their participation.

Nearly half (27 out of 66) of school CU Coordinators reported in the endpoint survey that they had received support from their local CU to keep CUO up to date, however a much smaller proportion (8 out of 66) reported that their local CU Manager was uploading their pupils' activity hours. Interview data suggests that this may have been related to local CUs reverting to the systems they had used prior to the introduction of CUO for the trial, particularly when schools were finding it challenging to keep CUO up to date. For example, some local CUs provided schools with their own spreadsheets, which were perceived to be more user-friendly, to record pupils' activity participation in, and local CU Managers uploaded this information into CUO. This was happening for select schools throughout the trial who had difficulties using CUO (such as the small number of schools who could not access CUO due to being blocked by the local authority firewall) but happened for a greater number of schools towards the end of the trial as schools reported that they were struggling to meet the deadline for uploading all pupil data. There was the intention that pupils' CUO dashboards would be regularly updated with their activities so pupils could monitor their hours building up to a graduation award, however, these scenarios suggest that this was not happening in practice.

Finally, less than half (29 out of 66) of CU Coordinators agreed or strongly agreed that CUO had accurately captured all the activities the pupils had participated in. Staff in case study schools likewise expressed concerns regarding the accuracy of the data recorded on CUO. The inconsistency in external learning destinations being validated may have contributed to this, as CUO would not always account for pupil participation in out-of-school activities. However, local CU Managers did not echo this, with most reporting that CUO had accurately captured pupils' participation in activities – although this was seen to be facilitated by the adaptation of CU Coordinators being responsible for adding pupils' hours. Both local CU Managers and school staff noted a small number of cases where pupils had added codes for

activities which they had not engaged in, or which did not merit a stamp, to increase their activity hours. CU Coordinators revoked these hours whenever this was observed.

As noted earlier, 623 (23%) of volunteer pupils, including 70 pupils from four whole schools, did not engage with CUO at all.

Were graduation ceremonies implemented as intended?

Graduation ceremonies were broadly not implemented as intended. One-third of schools did not participate in any graduation ceremonies at the end of the trial period and less than half of pupils reported that they had graduated or would graduate at this time. Furthermore, while as part of the programme schools were expected to attend an external graduation event hosted by CU, in practice in-school graduation ceremonies were just as common.

The graduation ceremonies are an important part of the Children's University model for achieving the intended outcomes of the programme. A key programme output in the Theory of Change is that 'pupils attend graduation ceremonies which celebrate their achievement'. It is intended that the opportunity for pupils to celebrate their achievements will lead to a reinforced sense of pride, value, and self-belief, which in turn leads to growth in pupil confidence and increased motivation to learn in and beyond the classroom. As part of the trial, it was intended that local CU Managers would run annual graduation ceremonies, taking place in local further/higher education settings, civic buildings or, in a small number of cases, at participating schools. Some adaptations were made to this intended approach. The Children's University Trust reported that graduation ceremonies taking place in the Autumn Term was an adaptation to usual practice but was necessary due to the trial not starting until January 2022, which meant pupils had less time than usual to reach the minimum hours of participation to receive an award. They also reported that this—in combination with the ongoing effects of Covid-19—led to fewer graduations taking place in the 2021/2022 academic year than would normally be expected. Even in summer 2023, however, only two-thirds of schools (48 out of 73) participated in a graduation ceremony, and nearly half of these (21 out of 48) took place at the school. In both years of the trial, a large number of graduations took place in-school, for example, as part of celebration assemblies or as events in their own right. This is a substantial adaptation considering the importance placed on graduations in the Children's University Theory of Change, particularly in terms of raising pupil aspirations. While the driving factor for this adaptation in the first year of the trial appears to have been ongoing concerns about Covid-19, a range of factors appear to have contributed to this adaption continuing into the second year of the trial. These factors include trial schools being located too far away from the local CUs graduation location, too few pupils within schools who had reached an award level, difficulties with the timing of the graduation ceremonies, and the cost for schools of transporting pupils to an external graduation. Local CU Managers noted that the growing prevalence of this adaptation was not unique to trial schools.

Two-thirds of CU Coordinators (44 out of 66) reported that at least some of the participating pupils from their school had received a graduation award at the end of Year 6.[50] Only a quarter of these (10 out of 44) reported that *all* participating pupils had received a graduation award. Moreover, only a quarter (28%) of pupils who responded to the endpoint survey reported having attended a graduation ceremony at the end of Year 5, and just under half (43%) that they had graduated or would graduate at the end of Year 6. It is possible that some pupils may not have identified 'in-house' graduation ceremonies as applicable for the purposes of the survey.

A notably higher proportion of CU Coordinators in less deprived schools reported pupils receiving a graduation award in Year 5 and/or Year 6, compared to those in more deprived schools.

What in-school and out-of-school activities were made available to pupils?

The most commonly validated activity types across both in-school and out-of-school activities were: 'Sports and physical' activities (17% of recorded activities); 'Arts, culture, and music' (14% of recorded activities); 'Mental health and well-being' (10% of recorded activities); and 'Practical life skills' (10% of recorded activities). Data from interviews with local CU Managers and case-study school staff support this, with the addition of class trips and residentials in Year 6.

[50] N.B. Throughout this section the total number of respondents will vary depending on the question due to some cases of attrition partway through the survey. The total number of respondents also does not align with the total number of participating intervention schools due to cases of survey non-response.

Pupil reports suggest that a large range of validated in-school activities were available in around half of cases, while validated out-of-school activities were less common. This aligns with CU manager and school staff reports of challenges validating local learning providers.

The logic model for the trial intended that local CUs would support schools to provide their own extra-curricular activities, as well as promoting activities in the area, which would provide pupils with varied activities and learning opportunities in and beyond school. Pupils, school staff, and local CU Managers reported that most stamps pupils gained had come from in-school activities.

Just over half of pupils (56%) agreed in the endpoint survey that their school offered 'lots' of clubs or activities throughout the week where they were able to collect CU activity stamps and almost two-thirds (62%) agreed that their school offered clubs and activities that interested them.

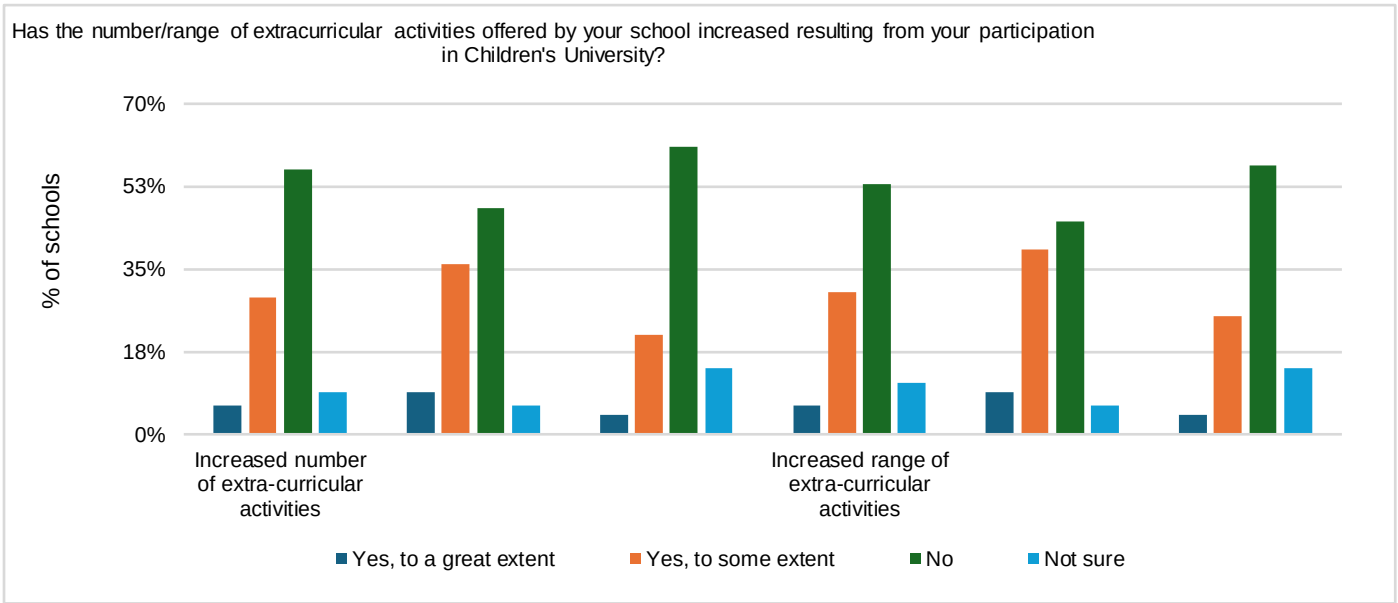
Less than half of pupils (44%) who responded to the endpoint survey agreed that there were 'lots' of clubs and activities they could go to in their local area where they could collect CU activity stamps. Similar findings emerged from the CU Coordinator survey, where less than half (25 out of 64) agreed that there were a wide range/number of CU-validated activities in their local area for pupils to access.

These findings are supported by reports from local CU Managers and school staff via the interviews. Interviewees highlighted that the lower levels of out-of-school activities recorded for Children's University reflected challenges with validating and receiving stamps for out-of-school activities, rather than actual levels of pupil participation. This is supported by the pupil survey findings that more pupils participated in out-of-school compared to in-school activities. However, there were some cases where there were fewer activities outside of school available for pupils to participate in, particularly in rural areas. Interviewees also reported that activities outside of schools were inaccessible for many pupils for disadvantaged backgrounds due to the financial costs attached to these.

What was the perceived impact of participation in Children's University on schools' extracurricular provision?

The endpoint survey asked school CU Coordinators to comment on the extent to which the number and range of extracurricular activities offered by their school had increased as a result of their participation in Children's University (see Figure 11 below). The largest proportion reported that participating in Children's University had not led to increases in either the number or range of extracurricular activities that their school offered (37 and 35 out of 66, respectively). However, where an increase was noted, a notably higher proportion of CU Coordinators from less deprived schools agreed that there had been an increase in the number and range of extracurricular activities offered compared to those in more deprived schools (15 and 16 out of 33 compared to 7 and 8 out of 28, respectively).

Figure 11: Extent to which participation in Children's University led to increase in number and/or range of activities offered by schools



Notes: Data from endpoint CU Coordinator survey: Compared to before you began participating in Children's University…has the number of extra-curricular activities offered by your school increased resulting from your participation in *Children's University? And Has the range of extracurricular activities offered by your school increased resulting from your participation in Children's University? (n=66).*

Of the 26 schools who reported that the number and/or range of extra-curricular activities had increased as a result of participating in Children's University, over half (15 out of 26) reported three or four new activities – although the range extended from one to 10.

This data suggests that, while some schools substantially increased their offer of extra-curricular activities, broadly little impact on schools' extra-curricular offer was observed. Interview data from local CU Managers and case-study school staff aligns with this. Most headteachers and school CU Coordinators reported that although they had validated their existing offer of clubs, activities, and school trips, they had not added to or diversified their extra-curricular provision. CU Manager reports were somewhat mixed, including suggestions that there had been an increase simply through schools taking on the activities provided by local CU, or that an attitude shift had occurred amongst schools and families in which extra-curricular activities are prioritised more, with clubs taking on more structure, following a theme and there being greater focus on understanding and developing pupils' interests.
It is likely, however, that regardless of whether schools increased their provision, pupils were exposed to more opportunities for extra-curricular activities than would usually be the case as both local CUs and the Children's University Trust provided additional activity sheets and some local CUs ran special workshops or event days specifically for Children's University.

Perceived outcomes

The IPE sought to explore the perceived outcomes of participating in Children's University for pupils in relation to: their ability to access extracurricular opportunities; their development of transferable skills and their motivation to engage in new activities; as well as personal outcomes including their sense of pride, value and self-belief.

IPE_RQ5: How well do participants feel the intended outcomes are being achieved for children (learning outcomes, personal, social, and future aspiration outcomes, with a focus on outcomes not being explored through the secondary outcomes survey)?

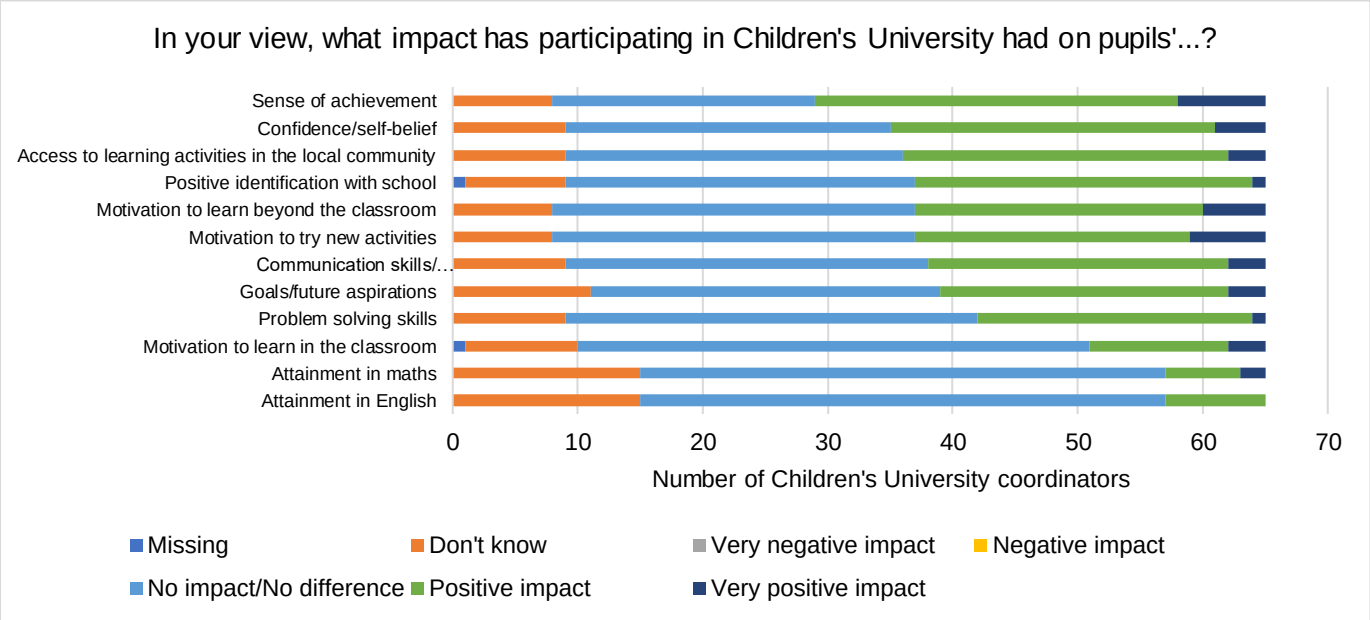
- There were mixed views among CU Coordinators around whether Children's University participation had led to meaningful pupil outcomes, with only 'sense of achievement' being considered by more than half of respondents to have been positively impacted. Just over one in 10 CU Coordinators reported perceiving a positive impact on attainment.
- Qualitative data suggests that university-based activities may have served to raise pupil aspirations, however this appeared to be limited to regions where local CUs gave pupils the opportunity to visit a university, either for CU activities or for the graduation.
- Pupils were positive about the benefits they gained from extra-curricular activities including for their teamwork skills (three-quarters of the surveyed pupils), sense of pride (two-thirds) and staying positive (two-thirds), although only a third agreed that participating in Children's University specifically had helped them to learn new skills.
- Pupils did increase the number of activities they participated in over the course of the trial period, but it is difficult to ascertain the extent to which this can be attributed to Children's University.

What were CU Coordinators' perceptions of the impact of Children's University participation on pupils?

The endpoint survey asked school CU Coordinators to indicate the extent to which they felt participation in Children's University had impacted pupils' learning, personal and social outcomes and their future aspirations. Over half (36 out of 65) of CU Coordinators reported a positive (or very positive) impact of Children's University participation on pupils' sense of achievement. Positive impact on confidence/self-belief (30 out of 65) and access to learning activities in the local community (29 out of 65) were the next most common. However, positive impacts were observed by less than half of respondents for all other categories (see Figure 12), with 'No impact/no difference' being the most common response. No CU Coordinators observed any negative impacts of participating in Children's University. No clear differences between more and less deprived schools were observed.

Qualitative data from school staff and CU Managers broadly aligns with the CU Coordinator survey findings, where Children's University was seen to have had a positive impact primarily on non-cognitive, personal outcomes, such as sense of achievement, pride, excitement, and happiness—particularly in relation to the graduation ceremonies (supporting their role in the Theory of Change). School staff reported that graduation ceremonies held at universities had helped to raise pupil aspirations, even among pupils whose parents had not been to university and who did not see this as a potential route for their child. The opportunity for pupils to speak with university students was also seen to raise pupils' awareness of their future education options. Other positive impacts reported by fewer interviewees included pupils' teamwork skills, their motivation to learn more about the topics of Children's University challenges, and an understanding that learning can take place outside of the classroom, with benefits for their physical and emotional well-being.

Figure 12: CU Coordinator perceptions of Children's University impact on pupils



Notes: Data from the endpoint CU Coordinator survey: *In your view, what impact has participating in Children's University had on pupils…? (n=65). Items have been reordered to display outcomes in descending order based on* extent of perceived impact.

Several interviewees did draw on specific examples of how the intervention had benefitted pupils with special educational needs (SEN), pupils with lower attainment and/or disadvantaged pupils in particular who did not regularly receive academic awards. However, others raised concerns that Children's University tended to only reach those pupils who would be highly engaged in school and extracurricular activities anyway, with financial and geographical barriers and/or limited parental support preventing it from reaching those pupils who would benefit the most (see 'Context and moderators' section).

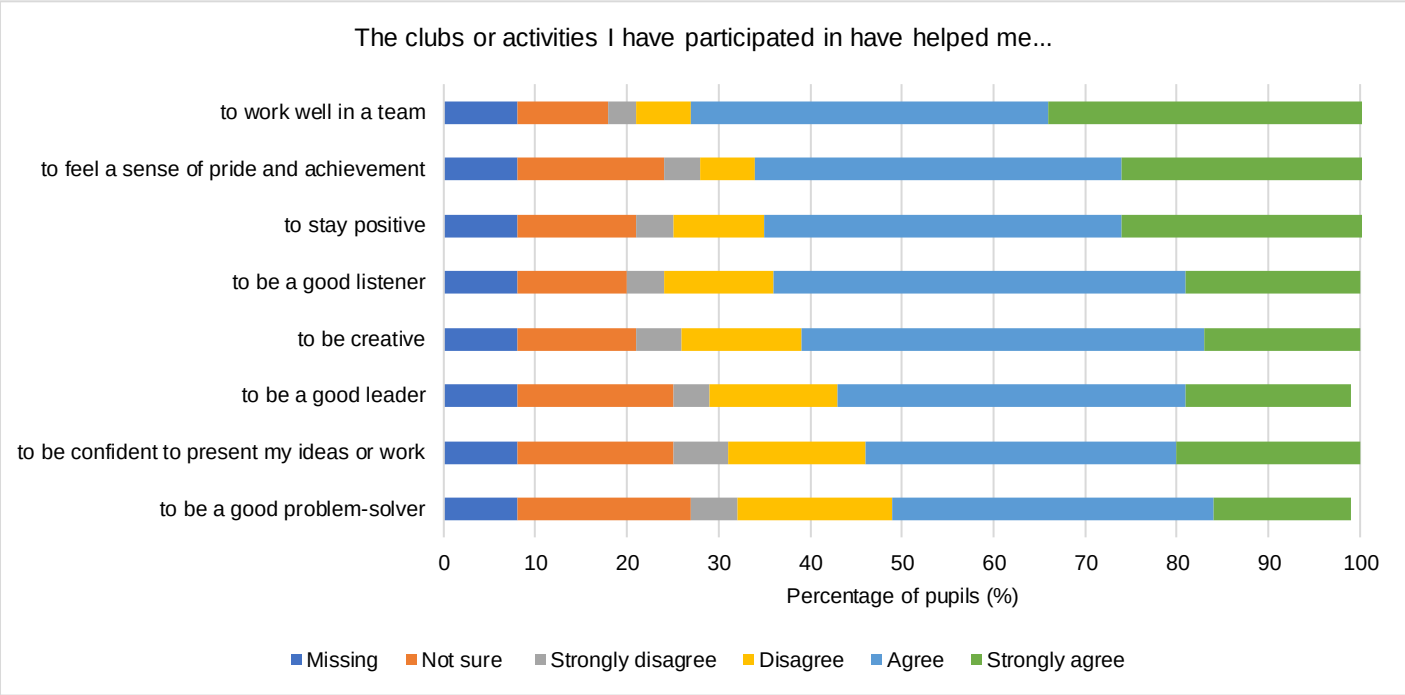
There is very little evidence to indicate perceived impact of Children's University participation on pupil attainment. Only 8 (out of 65) CU Coordinators reported a positive (or very positive) impact in this respect. One local CU Manager reported that Children's University can positively impact attainment, however, this had not been reported to them by teachers involved in this trial and was purely anecdotal. Moreover, another local CU Manager specifically noted that the benefits of Children's University are around 'soft skills' that are unlikely to translate into a measurable impact on academic attainment, particularly not within the five academic terms covered by the trial.

What were pupils' own perceptions of the benefits of participating in Children's University?

In the endpoint survey, pupils were asked about the impact of the CU clubs and activities they had participated in, and over half of pupils agreed that they had benefitted in each of the areas they were asked about (see Figure 13). Benefits were most commonly reported in relation to working well in a team (74%) and broader personal development—a sense of pride and achievement (67%) and staying positive (66%). This was confirmed in the pupil focus groups. For example, pupils reported that school community roles such as play leaders and peer mediators, and team-based activities they participated in during school trips, had had a positive impact on their teamwork, communication, and leadership skills. In a separate question, nearly three-quarters of pupils (74%) were proud of what they had learned in their CU activities

and clubs. However, only a third (33%) of pupils agreed that participating in Children's University had helped them to learn new skills. Moreover, only around a third of pupils agreed/strongly agreed that being involved had encouraged them to do *more* or try *new* activities/clubs (33% and 38% respectively), while a similar proportion disagreed/strongly disagreed with these statements. This suggests that while pupils may have perceived benefits from their extracurricular CU participation, increases in participation were not necessarily attributable to participation in the programme (see 'Scale-up' section for further reflections).

Figure 13: Volunteer pupils in intervention schools' perceptions of the ways in which participation in CU clubs and activities has helped them



Notes: Data from the endpoint intervention pupil survey: *Below is a list of statements about some of the skills you might have learnt or got better at from the CU clubs or activities you have been participating in…The clubs or activities I have participated in have helped me…(n=1,550). Items have been reordered to display outcomes in descending order based on extent of perceived impact. Percentages have been rounded so may not always add up to 100.*

The pupil focus groups presented a more positive picture in this respect, however. For example, some pupils reported that completing the monthly and holiday Children's University challenges, which involved writing, had a positive impact on their literacy skills. Others described how Children's University had encouraged them to try new activities that pushed them out of their comfort zone and subsequently increased their confidence and motivation to seek out new opportunities. They reported that the chance to be rewarded for their participation had motivated them to participate in activities, with the graduation giving pupils a goal to work towards, and that they felt proud when they reached a graduation award level. It is possible that pupils may not have always conceptualised these kinds of benefits as 'new skills' when responding to the survey. Similarly, several pupils in the focus groups found it difficult to translate participation in CU activities into broader learning or non-cognitive outcomes, commenting instead on the activity-specific skills that had improved, such as swimming or football techniques, or increased knowledge about historical events from museum visits.

Most pupils in the focus groups likewise reported that Children's University had encouraged them to be involved in more activities and try more clubs. This perspective was echoed by most case study school staff. Of the small number of pupils whose participation in extracurricular activities had not changed, these pupils were already participating in multiple clubs and did not have the capacity to be involved in additional activities. This difference may be partly attributable to social desirability bias, as well as selection bias on the part of the teachers in nominating pupils to participate in the focus groups, and these schools having been deliberately sampled for high levels of engagement.

Moreover, school staff did note that the pupils for whom Children's University did have an impact tended to be those who were already motivated and engaged in a range of extracurricular activities, regardless of their participation in Children's University, and were the pupils who received support from their parents to engage in academic and extracurricular activities. Although there were examples of individual pupils from disadvantaged backgrounds who had high participation in Children's University, more broadly there was less evidence from school staff that disadvantaged

and harder-to-reach pupils had increased their extracurricular participation, with school staff expressing concerns that these pupils had not benefited as much from the programme as their more affluent peers.

Moderators and context

The logic model identifies a range of potential factors that might moderate the strength of any impacts achieved. These include: extent of whole-school support for the programme; quality of collaboration between the different stakeholders; ease of access and cost of activities; and parental support. These factors all emerged to be crucial in determining how effectively the programme could be implemented and/or levels of pupil engagement. However, additional factors such as the wide geographical spread of participating schools and the lingering effects of the Covid-19 pandemic presented further unanticipated challenges. We discuss these further below.

IPE_RQ3: What are the facilitators to implementation (including local CU support to schools, validation support, local offer, use of CUO, graduation support, school promotion of activities, school support to pupils, parental support, funding arrangements)? What are the barriers/challenges? To what extent was the programme well supported—by local CUs, by schools, by parents? To what extent did schools and parents engage with Children's University? To what extent were any differences in the funding arrangements facilitators/barriers to implementation (including schools' engagement and fidelity)? Were there any barriers to implementation? Any support challenges?

- Key facilitators for implementation were high levels of CU Coordinator engagement, SLT support and CU Manager support.
- Key barriers for implementation included limited capacity, absences and (CU Coordinator) turnover in both schools and local CUs, the effects of the Covid-19 pandemic, and the wide geographical spread of participating schools.
- CU Coordinator and CU Manager enthusiasm supported pupil engagement in CU, as did free activities, and the prospect of rewards and graduation ceremonies.
- Pupil engagement with CU activities was limited in some cases by low levels of parental support (or capacity to do), limited availability of and difficulty accessing validated local activities, as well as the impacts of Covid-19 and the following cost-of-living crisis.

IPE_RQ3: How were children from disadvantaged backgrounds encouraged and enabled to take part?

- Subsidised activities were the most common form of support for disadvantaged pupils. This was notably more common in more disadvantaged schools, compared to less disadvantaged ones.
- Less disadvantaged schools were more likely to report not doing anything to support disadvantaged pupils compared to more disadvantaged ones.
- Levels of CU Coordinator satisfaction with Children's University were much lower in more deprived compared to less deprived schools.

What factors supported the implementation of Children's University in schools?

Level of engagement from the school CU Coordinator

Both school staff and local CU Managers reported that the key moderator for effective implementation was the engagement and commitment level of the CU Coordinator. Implementation was seen to benefit in cases where the CU Coordinator was engaged with and enthusiastic about the programme but was seen to suffer significantly in cases of reluctant CU coordinators (e.g who had been given, rather than volunteered for, the role) or where the CU Coordinator had too many other competing responsibilities. Several local CU Managers also raised concerns that some headteachers had nominated staff for the CU Coordinator role without fully informing them of what this would entail.

Due to the demands of the role, it was recommended as part of the trial that headteachers did not take on the CU Coordinator role, and CU Managers indicated that challenges for sufficiently prioritising Children's University tended to emerge when this occurred. Nonetheless, eight (out of 66) CU Coordinators reported their role as headteacher in the endpoint survey. CU Managers did, however, see benefits in the CU Coordinator holding another more senior role in the school as this tends to give them more influence and authority over the culture around extracurricular activities. Similarly, staff from several case-study schools also noted that it was helpful to have a CU Coordinator without full-time teaching responsibilities (e.g. an assistant/deputy headteacher or teaching assistant), as this allowed them greater flexibility to engage with activities and events. Around a third (21 out of 66) of CU Coordinators identified themselves as

assistant or deputy headteachers. However, the most common role for a CU Coordinator was that of classroom teacher—as was the case in nearly half of participating schools (31 out of 66).

Local CU Managers reported that the trial delivery model of restricting participation to a single year group made the implementation particularly vulnerable to staff turnover, as responsibility for the programme lay with a single individual. Moreover, this model failed to engage other staff members to support with extracurricular activity provision, as reflected in the survey findings where only just over a third (25 out of 64) of CU Coordinators reported that other staff at their school had been willing to support Children's University through delivering a lunchtime or after-school club.

Level of SLT support

Two-thirds of CU Coordinators (42 out of 64) agreed or strongly agreed that they had received sufficient support from their SLT to implement Children's University in their school (see Figure 14). This was seen by both school staff and local CU Managers to be important for ensuring Children's University was visible in the school community and embedded in school culture, for example, through ensuring extracurricular activities were prioritised. Interviewees highlighted that SLT support was vital for making strategic decisions that would affect the implementation and take-up of Children's University, such as using Pupil Premium funding to ensure all in-school activities could be accessed for free. It was also important for SLT to recognise and allocate the time commitment that CU Coordinators needed to lead the programme—namely, collating information about pupils' participation in activities, updating CUO, and sourcing and running activities. Support from the broader staff team was likewise seen to facilitate implementation, with some school staff reporting that they had received support from colleagues to validate activities and maintain CUO and deliver a range of in-school extracurricular activities.

Level of local CU support

The logic model states that local CUs will source local, online and at home learning activities and raise awareness of these to schools and parents. Data from the CU Coordinator survey and interviews with local CUs, Children's University Trust, and school staff suggest this took place as intended.

Case study school staff reported that the support they had received from their local CU Managers had been a key facilitator for implementation. The endpoint survey asked CU Coordinators to indicate what ongoing support they had received, either from their local CU or Children's University Trust. A large proportion (46 out of 66) had received support with providing resources such as challenge sheets. Just less than half of CU Coordinators received support to source activities (30 out of 66), and only a quarter had received support in the form of CU delivering or running activities/masterclasses (17 out of 66).

CU Manager visits to schools and enthusiasm for the project had helped to drive school and pupil engagement. School staff likewise considered the practical support provided by local CU Managers, such as signposting schools and families to local learning destinations and helping schools understand how to enhance their extra-curricular offer, to be a key facilitator for ensuring pupils had access to a range of extra-curricular activities.

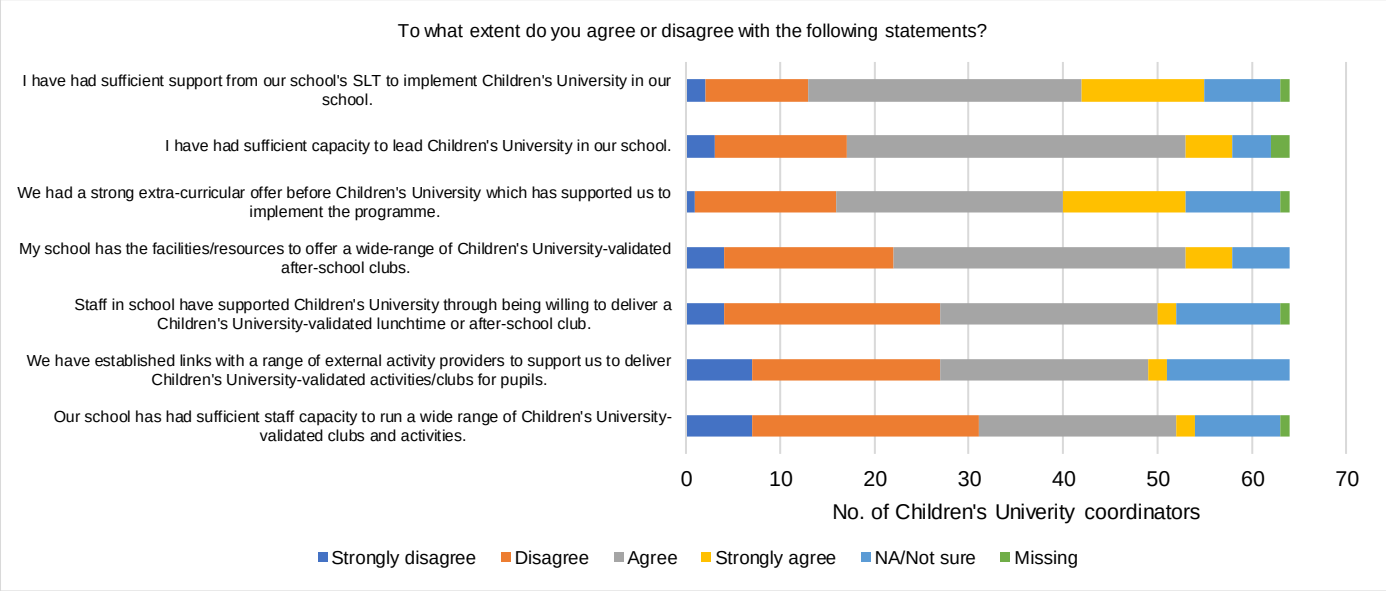
Local CU Managers themselves highlighted the importance of regular and open communication with schools to ensure they were aware of the support the local CU could provide, such as in terms of providing activities, additional training and answering questions. They highlighted that ongoing communication was vital in building relationships with schools and for maintaining momentum. However, most local CU Managers had faced challenges with low engagement from some schools in their area and noted that despite persistent effort to engage them with Children's University, in some cases, schools did not respond and engage with them.

Nearly all CU Coordinators who reported that they had received some form of support from their local CU or Children's University Trust over the trial period agreed that they were satisfied with the level of ongoing support they had received (52 out of 58 were satisfied with ongoing local CU support and 46 out of 58 were satisfied with ongoing Children's University Trust support).

Finally, while not emphasised as key facilitators in the interview data, CU Coordinators were broadly positive about having the facilities and resources in their schools to offer a wide range of CU-validated after-school clubs, as well as about an existing strong extra-curricular provision supporting implementation of the programme (see Figure 14). CU

Coordinator responses were, however, more mixed in relation to levels of staff capacity and willingness to engage with the programme, as well as the extent to which established links with external providers were a facilitator for delivering CU activities.

Figure 14: Factors influencing the implementation of Children's University in schools according to CU Coordinators



Notes: Data from CU Coordinator survey: *To what extent do you agree or disagree with the following statements? (n=64). Pupils could provide a maximum of six activities in their response. N/A, not applicable.*

What were the barriers to implementing Children's University in schools?

Varied levels of CU Coordinator engagement and support

School-level engagement with Children's University was mixed across all local CU areas. All local CU Managers reported experiences of schools in their area that were very engaged with Children's University, and others that did not respond to emails or appear to engage at all with Children's University. Local CU Managers reported that this was largely driven by the capacity of the school CU Coordinator to drive the programme and their enthusiasm for Children's University (see Moderators & Context section for further information). There are indications that school deprivation levels may have also played a role in determining levels of engagement – for example, all four of the schools that did not record any pupil activities on CUO were among the most deprived.

CU Coordinator engagement was influenced by workload and competing pressures. Around two-thirds (41 out of 64) of CU Coordinators agreed (or strongly agreed) that they had sufficient capacity to lead CU in their school. CU Coordinators in less deprived schools were more likely to report they had sufficient capacity (27 out of 32), compared to those from more deprived schools (16 out of 27). However, only just over one in three (24 out of 64) agreed (or strongly agreed) that their school had sufficient staff capacity to run a wide range of CU-validated clubs and activities (see Figure 14). No difference was observed in relation to deprivation level in this case. This suggests that, while most CU Coordinators were supported to take the time necessary for running the intervention, capacity constraints more broadly limited the extent to which in-school extra-curricular activities could be made available for Children's University validation. There was some indication from interview data that this was particularly problematic for schools with a small staff body. While only a third (22 out of 64) reported that their school was prioritising tutoring/catch-up support over extracurricular activities following the pandemic, this may have contributed to even lower capacity for extracurricular provision in some schools.

Local CU Managers reported some cases of schools increasing their engagement in the second year of the trial as they became more familiar with the programme, and that pupils generally responded positively to graduations at the end of Year 5 in terms of feeling motivated to engage. However, local CU Managers also reported instances of engagement reducing in the second year of the trial, attributing this primarily to the prioritisation of Year 6 National Curriculum assessments (SATs) over extra-curricular activities. Local CU Managers reported that it had been particularly difficult to engage schools with the free activities they offered to deliver in the second year of the trial when pupils were in Year 6 due to the competing priority of SATs, which made it difficult to add extra-curricular activities into the timetable.

In addition, CU Managers reported that turnover in the CU Coordinator role often created challenges for school engagement, including when it was handed over from a Year 5 to Year 6 class teacher as a result of year group progression. The CU Coordinator survey suggests that this occurred in around a third of schools (21 out of 66). Additional challenges were created in cases where the CU Manager was not notified of the change so was unable to provide support to help the new CU Coordinator understand and continue implementing the programme. In a small number of cases, temporary absence of CU Coordinators was reported by local CU Managers and school staff themselves to lead to a 'lull' in implementation of Children's University because it meant there was no-one at the school driving pupil participation or keeping CUO updated, and it took time to build momentum back up once they had returned.

Local CU capacity limitations and staff turnover

Local CU Managers reported that the capacity within the local CUs was in some cases a limiting factor in terms of the level of support they could provide to schools. This varied considerably between local CU areas. For example, some local CUs were made up of a team of people whereas in other areas, it was run by just one person. In addition, some local CU Managers also ran other outreach or community projects alongside Children's University meaning they were often faced with competing priorities which affected their commitment to the trial. In these cases, local CUs did not have the same capacity to support schools with sourcing, validating, and providing activities or maintaining momentum of the programme in schools. Turnover of local CU Managers also led to disrupted implementation in a small number of areas and even once new Managers were recruited, Children's University Trust reported that it took time for them to engage with Children's University as a programme and with the trial. However, local CUs reported that having a strong network of local partners and supporters facilitated their ability to implement Children's University and support schools in their areas without generating additional costs.

Covid-19

When the intervention delivery commenced in January 2022, some restrictions were still in place within schools to counter the spread of Covid-19. Many CU managers reported that this resulted in fewer extracurricular activities being delivered compared to usual practice. The disruption caused by the pandemic had resulted in lower staff capacity to run these activities, external providers (including CU) were not allowed into the school and pupils were not allowed to leave the school for trips or events. Even once restrictions were lifted, some families were hesitant for their pupils to attend additional activities. Some CU Managers also felt that CU was not a priority when schools were facing the challenges introduced by the pandemic, including in terms of pupil academic progress. A third of CU Coordinators (22 out of 64) agreed that their school was prioritising learning recovery work over extra-curricular activities following the pandemic.

These restrictions also meant that the introductory events for parents, staff and pupils had to occur virtually in most cases. Some CU managers felt this was less engaging than an in-person event, particularly due to perceived high levels of 'Zoom fatigue' at the time. Engaging parents was also more challenging as they were not allowed in to schools.

On the other hand, one case-study school headteacher reported that providing extra-curricular activities had become a school improvement objective in response to Covid-19, highlighting the benefits for pupils' cultural capital, and they hoped that engaging with Children's University would help them to achieve this. Moreover, local CU Managers highlighted some of the benefits brought by necessary adaptations to the programme. For example, those with schools spread across a large geographical area found it was easier to deliver initial briefings remotely and the increase in online activities meant these could be delivered to more pupils at a time. One teacher also reported that pupils engaged well with activities during the restrictions because it gave them a challenge to focus on.

The effects of Covid-19 did not emerge as key concerns in the CU Manger and CU Coordinator interviews at the end of the programme, suggesting that the impact of the pandemic was less significant in the second year of the trial.

Wide geographical spread of participating schools

Staff from several schools reported feeling quite isolated in their Children's University delivery and expressed their desire to be able to network more with other schools participating in the trial and Children's University more broadly, local further education and activity providers. Based on their previous experience of delivering Children's University, local Managers acknowledged that Children's University works best when a cluster of schools within the same area are engaging, however reported that trial schools were often spread out and working in remote areas. Local CU Managers also reported that it had been more difficult to support schools spread out across a wide geographic area because it was more difficult to visit them due to the time and costs associated with this and Managers themselves were less aware

of the local activities which pupils may be participating in or that they could recommend to schools and families. The location of some schools also presented a barrier for school trips and for attending external graduation ceremonies due to the length of the journey and the cost of coaches. Local CUs run from universities had been able to support schools to overcome this challenge through funding transport for schools to visit the campuses using funds from the trial.

What factors supported pupil engagement with Children's University?

Enthusiasm and support from the school CU Coordinator and local CU Manager

Local CU Managers and case-study school staff reported that pupil engagement benefited when local CU Managers had the opportunity to visit pupils in-person. Conversely, pupil engagement appears to have suffered where pupil briefings had to be held online or delivered by school staff due to Covid-19 restrictions. The CU Coordinator's engagement with and enthusiasm for Children's University was also a key moderator. Headteachers and local CU Managers likewise considered the CU Coordinator's engagement and enthusiasm to be vital for motivating pupils to engage with the programme. CU Coordinators themselves reported that pupils required frequent reminders about the activities they could participate in and the importance of recording hours on CUO so they could achieve a graduation award.

Free activities accessible to all pupils

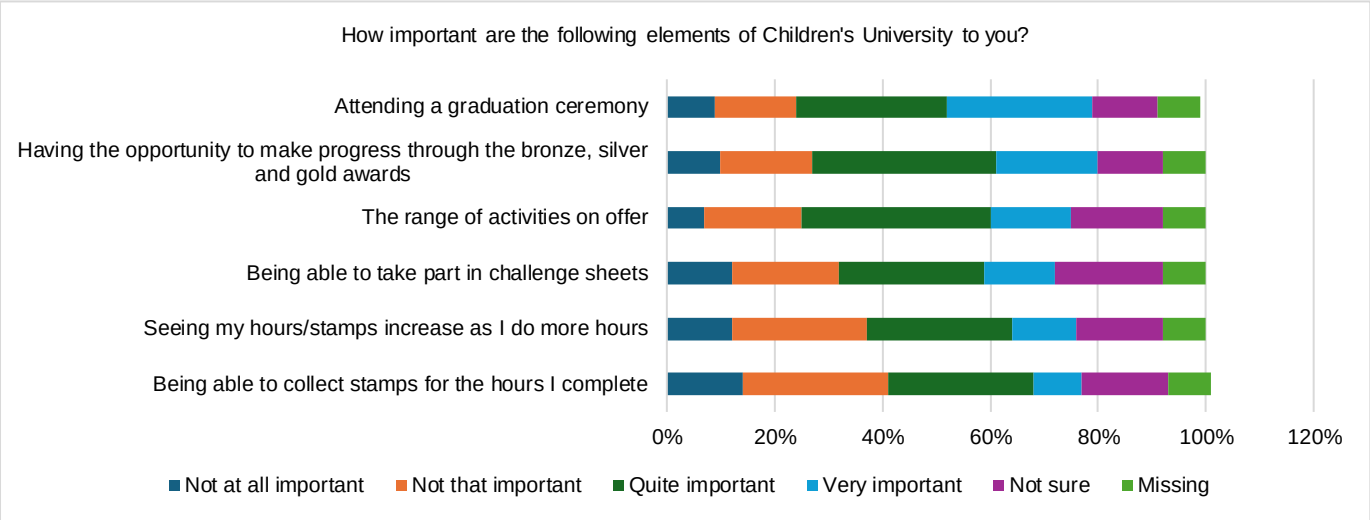
Local CU Managers and case study school staff highlighted the importance of free and subsidised activities, which pupils could participate in. All activity packs and holiday challenges provided by local CUs were free, as were most of the activities provided by schools. School staff reported that they had been able to subsidise class trips and residentials and had made after-school clubs free using Pupil Premium funding, which had been essential for pupils, particularly those from disadvantaged backgrounds, to engage with Children's University. However, there were still concerns from some school staff that Children's University was not reaching pupils with English as an Additional Language (EAL), SEN, and those eligible for Pupil Premium sufficiently, which they attributed to lack of parental engagement with Children's University and school more broadly (see below).

Rewards and graduation ceremonies

The endpoint pupil survey asked pupils to indicate how important they valued various elements of the Children's University programme (see Figure 15 below). The opportunity to attend a graduation ceremony and progress through the award levels were seen to be the most important elements, with over half of pupils judging these to be 'quite' or 'very' important. In a separate question, around half (52%) of pupils reported that they felt it was important to receive awards or celebrations from taking part in clubs or activities. Pupils in the focus groups reported feeling very proud at the graduation. They liked wearing the graduation hats and gowns and liked that their achievements had been celebrated in front of their parents and other pupils. School staff and local CU Managers likewise reported that the incentive of achieving awards and attending a graduation ceremony (particularly those held at external locations) was the greatest driver behind pupils engaging with Children's University.

All other elements of the Children's University model were considered important by half or fewer of pupil respondents.

Figure 15: Importance of elements of the Children's University model as perceived by volunteer pupils in intervention schools



Notes: Data from the endpoint intervention pupil survey*: How important are the following elements of Children's University to you?* (N = 1550). Question only shown to pupils who reported participating in Children's University. Items have been *reordered to display elements of the Children's University model in descending order based on pupils' perception of importance.*

School staff also reported that pupils being able to visually monitor their progress, either on CUO or on leaderboards within the classroom, had led to friendly competition with peers, which had subsequently motivated pupils to continue building up their activity hours. However, only one in five (21%) pupils reported that they would like to continue collecting stamps for the clubs and activities they participated in to achieve more CU awards, and a greater proportion (29%) reported that they would *not* like to continue collecting CU activity stamps.

What factors were a barrier to pupil participation?

Reliance on parental support

The logic model for the trial states that parents will encourage pupils' participation in Children's University, while parent availability to support pupil participation is cited as a moderating factor. This was supported by the trial findings, where parental support was still seen to be an important enabler of pupil participation in extracurricular activities. As a result, where parents were not engaged or faced additional financial or logistical barriers, pupils may have been less able to fully participate in the programme.

Overall, reported levels of parental engagement appears to have been moderately low. In the CU Coordinator survey, respondents were asked to comment on the proportion of parents who encouraged and supported their child to engage in validated in-school activities, engage in validated out-of-school CU activities, and keep their CUO profile up to date. Across each of the three activities, around half of CU Coordinators reported that 'some' of the parents had engaged (35–38 out of 66). The next most common response to each of the three statements was: 'I don't know' (13–15 out of 66) (a finding in itself, signalling limited interaction between parents and schools regarding CU), followed by 'most' of the parents (4–13 out of 66), then 'none' of the parents (3–9 out of 66).

Similarly, there appears to have been only moderate parental engagement in the graduation ceremonies. A third of CU coordinators (22 out of 66) reported that 'some' parents attended the ceremony, while a fifth of responses reported 'most '(13 out of 66) and 'none' (12 out of 66). A quarter of respondents (15 out of 66) said that they did not know about parental attendance at the graduation ceremony—again, a finding in itself in terms of the extent to which there was communication between schools and parents around Children's University.

Pupil perception of parental engagement with Children's University was similar, with only a quarter (23%) reporting that their family encouraged them to try new activities as part of Children's University.

These survey findings are supported by the interview data. School staff reported that parents were supportive of their children participating in the programme and had encouraged them to participate in clubs available in-school, however, parental ability to support their child to attend clubs and activities outside of school differed, depending on their ability

to fund and take their child to such opportunities. Several school staff also reported a lack of parental engagement with CUO.

Both schools and local CU Managers expressed concerns that those children receiving parental support were the more affluent children who would be involved in lots of activities anyway, and that parental engagement was a barrier for the participation of more disadvantaged children, whether due to parental disengagement or limited financial means. This is reflected in the notably smaller median of activity hours recorded on CUO for FSM-eligible pupils (26.5 hours) compared to their more affluent peers (37.5 hours), excluding pupils who did not record any activity hours on the platform.[51] Some school staff also highlighted that parents with SEN or for whom English is their second language struggled to engage with Children's University due to it being 'literature heavy'.

Limited support provided by the schools and local CUs to engage parents may have contributed to lower levels of parental involvement in some cases. Only five CU Coordinators reported that their local CU had delivered this briefing/assembly, reflecting reports from the local CU interviews that schools preferred to manage these relations themselves. However, only one in five CU Coordinators (13 out of 66) reported that their school delivered a parent briefing/assembly ahead of commencing the programme. Moreover, communication between schools and parents around Children's University appears to have been particularly low in more deprived schools, with a two to three times greater proportion of CU Coordinators in more deprived schools responding 'I don't know' to questions relating to parental encouragement or support of pupil engagement compared to less deprived schools.

Covid-19 and the cost-of-living crisis

As previously mentioned in this section, the Covid-19 restrictions such as quarantine requirements, class 'bubble', and social distancing rules were often still in place in schools at the start of the trial, limiting the extracurricular activities they could offer. Local CU Managers reported that in many cases, schools' extracurricular and enrichment provision did not return to pre-pandemic levels until later in the spring or, in some cases, early in the Summer Term 2022. There was also some ongoing reluctance from parents for pupils to participate in clubs, particularly in cases where family members were vulnerable.

The cost-of-living crisis that emerged in the second year of the trial likewise presented challenges for schools to deliver extracurricular activities due to rising energy costs, which meant schools could not afford to stay open into the evenings. This also meant that extracurricular activities were not a priority, or simply not feasible, for many families struggling financially.

How did schools and local CUs promote the engagement of disadvantaged pupils in Children's University?

Half of CU coordinators (35 out of 66) reported that their school provided free or subsidised extracurricular activities to encourage participation among disadvantaged pupils. Beyond this, however, additional support for disadvantaged pupils (such as funding transport costs and prioritising club spaces for them) from either schools or local CUs appears to be minimal, and a quarter of less deprived schools (9 out of 33) reported doing nothing different at all.

The logic model states that local CUs should encourage schools in areas of disadvantage to engage with the programme, and that schools and parents should encourage pupil participation (particularly those eligible for FSM) to engage in a variety of activities and remove barriers to their participation.

The endpoint survey asked CU Coordinators how their school had enabled and encouraged pupils from disadvantaged backgrounds to take part in Children's University. The most commonly reported support was subsidising or providing free extra-curricular activities. This was reported in two-thirds of more deprived schools (18 out of 28), but just half of less deprived schools (16 out of 33). Moreover, while less than half of CU Coordinators (25 out of 64) agreed (or strongly agreed) that they had sufficient funding to provide subsidised or free CU-validated activities for their pupils, there was no notable difference based on level of deprivation.

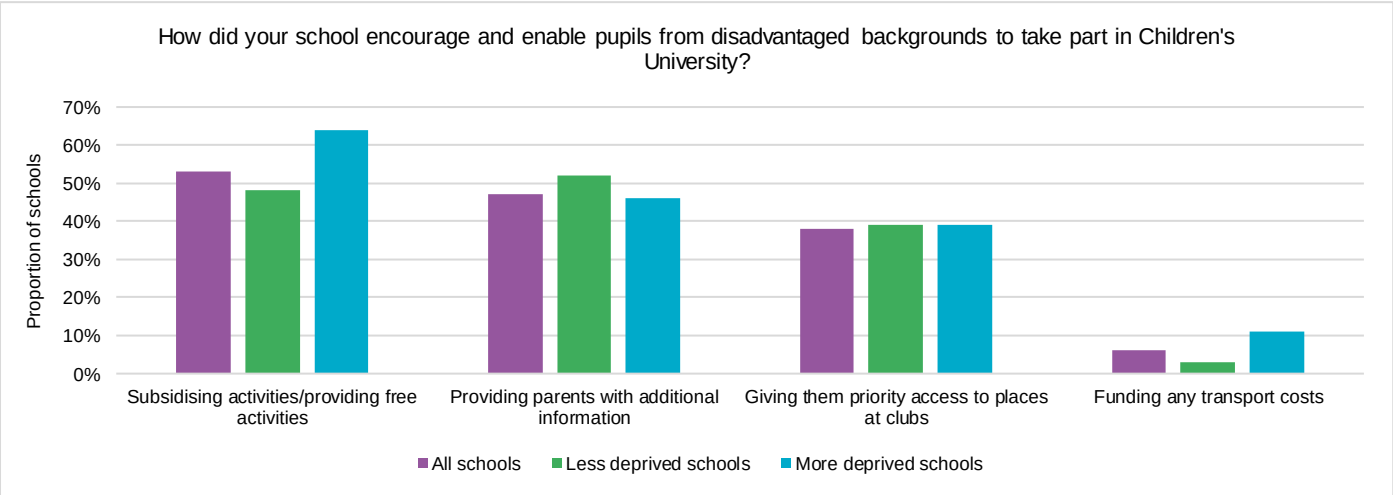
Other types of support were reported to occur in less than a third of schools, with only a very small number funding transport costs (4 out of 66) (see Figure 16 below). A fifth (14 out of 66) of CU Coordinators reported that they did not

[51] While potentially disproportionately manipulated by outliers, the difference in means is even more notable: 55.4 hours compared to 70.9.

do anything differently to encourage participation of disadvantaged pupils compared to their peers—with this response being notably more common in less deprived compared to more deprived schools (one in ten compared to one in four).

A small number of CU Coordinators reported that they had also ensured disadvantaged pupils were aware of the clubs they could attend and had run clubs for disadvantaged pupils at lunchtime to ensure they could attend.

Figure 16: Support provided to disadvantaged pupils according to CU Coordinators



Notes: Data from endpoint CU Coordinator *survey: How did your school encourage and enable pupils from disadvantaged backgrounds to take part in Children's University? (n=66).* CU Coordinators could select more than one response.

Reflecting the survey findings, staff in case study schools generally reported that they had either fully funded or subsidised clubs, class trips, and residentials using Pupil Premium funding so that all pupils could access these opportunities. However, in-schools clubs tended to be at no additional cost independently of Children's University, and there was little evidence that different methods were used to encourage disadvantaged pupils to participate in Children's University specifically.

The evaluation team also asked local CUs Managers if they had taken any action to promote the engagement of disadvantaged pupils in Children's University. Local CU Managers emphasised that all the activities that they promoted to schools were of low or no cost to ensure they were accessible to all pupils, and that it would be possible for pupils to graduate without any financial cost to their parents. One local CU also explained that they compensated schools for travel to the activities and events they hosted.

Overall, levels of satisfaction with the programme appear to have been lower in more deprived schools: less than half (13 out of 27) of CU Coordinators at more deprived schools reported that they had been satisfied or very satisfied with Children's University, compared to over three-quarters of those at less deprived schools (25 out of 32).

Business as usual in control schools

In order to understand the additional experiences and impact of taking part in extra-curricular activities as part of the CU programme, we asked control group schools and pupils what they participated in during their extra-curricular time during the trial period (i.e. to find out what a 'usual' experience would be during this time). We know from baseline responses, that schools intended to re-establish their extracurricular offer following the Covid-19 pandemic and that control volunteers were keen and planning to take part in various activities and clubs. As we shall discuss in this section, control schools and pupils did indeed take part in extracurricular activities—both as planned and in response to the changing context relating to Covid-19 restrictions being lifted. Extracurricular provision and participation increased notably in the control group over the trial period, and to a greater extent than the control school trial leads themselves anticipated. On average, control schools reported delivering more activities in 2021/2022 than they had indicated at baseline that they planned to deliver that year (median of nine activities compared to a median of seven).[52] However, as the trial period coincided with a period of recovery following the Covid-19 pandemic, these changes are likely simply

[52] N.B. Schools could only report up to ten activities at each timepoint, suggesting that this increase may even be an underestimate.

the result of the changing context. There is no indication of either contamination or control schools mimicking the treatment offer.

IPE_RQ6: What happened in the control group? What was Business as Usual (BAU)?

- There was a notable increase in the number of activities control schools were delivering at endline compared to baseline.
- The proportion of control schools reporting that they provided awards or celebrations for extracurricular activities saw a large increase over the trial period.
- There was a slight increase in the number of activities pupils in control schools were participating in at endpoint compared to baseline.
- There appears to have been minimal difference in practice between intervention and control schools in relation to the schools' extracurricular offer (aside from CU activities being validated), the number and kinds of activities that pupils took part in participation, and celebration of extracurricular activities (aside from CU awards specifically).

How did BaU in control schools change over time?

At endpoint, almost all control schools who responded to the survey reported that extracurricular activities had been on offer to Year 5 pupils in 2021/2022 (99%) and all control schools reported that activities had been available to the trial cohort of pupils when in Year 6 (2022/2023). In each year of the trial, most schools reported that they had delivered at least eight activities, across three to five activity types. This indicates a notable increase in the number of activities delivered compared to baseline, when most schools offered up to four activities across one to three activity types.

There was no change in which activity types were most common between baseline and endpoint. In both years, sports/games clubs were most common, with half of all clubs offered being sports-based. This was followed by performing and visual arts and academic clubs. Of all the activities available in Year 5 and Year 6, the majority (84% and 80%, respectively) were attended by 'some' of the Year 5 and Year 6 pupils. Around two-thirds of activities had been facilitated by school staff.

A notable change between baseline and endpoint was an increase in the proportion of control schools reporting that they had provided upper KS2 pupils with awards or celebrations for their achievements in extracurricular activities over the last two academic years, with an increase of 20 percentage points (from 45 out of 73 to 61 out of 74). However, a much smaller change was observed in this respect in the pupil surveys (53% to 59%), although a slightly smaller proportion of pupils felt that it was important to receive awards or celebration for their participation in extracurricular activities at endpoint (44%) compared to baseline (51%).

To what extent did pupils in control schools participate in extracurricular activities over the intervention period?

There was little difference in control group pupils' participation in extracurricular activities over the course of the trial. Comparative analysis of the activities, which pupils reported at baseline and endpoint showed a mean increase over the trial period of 0.2 total activities (baseline mean = 2.5; endpoint mean = 2.7 activities) and a mean decrease of 0.04 in the breadth of activities.

At endpoint, 60% of pupils reported participating in at least one in-school extracurricular activity, while a slightly higher proportion (68%) reported that they took part in at least one activity outside of school.

Sports/games were once again the most commonly reported in-school and out-of-school clubs (56% and 67%, respectively), followed by performing arts (16% and 13%, respectively) and academic clubs (14% of both in- and out-of-school clubs). As reported at baseline, most in-school (75%) and out-of-school (57%) activities took place once a week, however out-of-school activities were more likely to take place more than once a week (37%) compared to in-school activities (16%).

Only one control school reported at endpoint that they were aware of any Year 6 children signing up to Children's University outside of school, suggesting very little direct contamination (certainly none of any concern for the trial).

To what extent did programme participation differ from BAU?

It appears that the programme resulted in minimal change to usual practice in relation to pupil participation in extracurricular activities. Comparative analysis of the number of activities that pupils in intervention schools reported in the pupil surveys at baseline and endpoint found a mean increase of 0.3 total activities over the course of the trial and a mean increase of 0.1 in the breadth of activities pupils engaged with. These differences are very similar to those reported for control group pupils (0.2 and 0.04).

Similarly, a slight increase from baseline was seen in the number of pupils in interventions schools who reported participating in at least one activity in-school (55% to 62%) or out-of-school (64% to 68%) (see Figure 17). However, similar increases were seen in the proportion of pupils in control schools doing at least one activity in-school (56% to 60%) and out-of-school (62% to 69%). This is likely to be primarily due to the shift away from Covid-related restrictions and protective behaviours, rather than indicating contamination within the experiment itself.

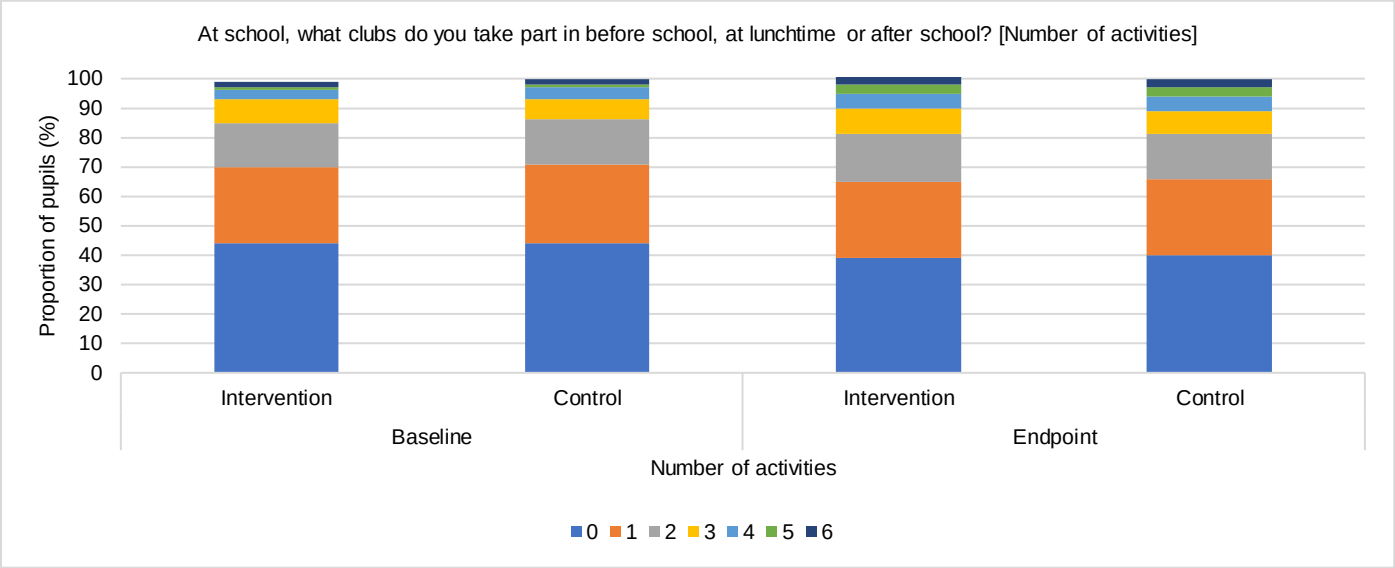
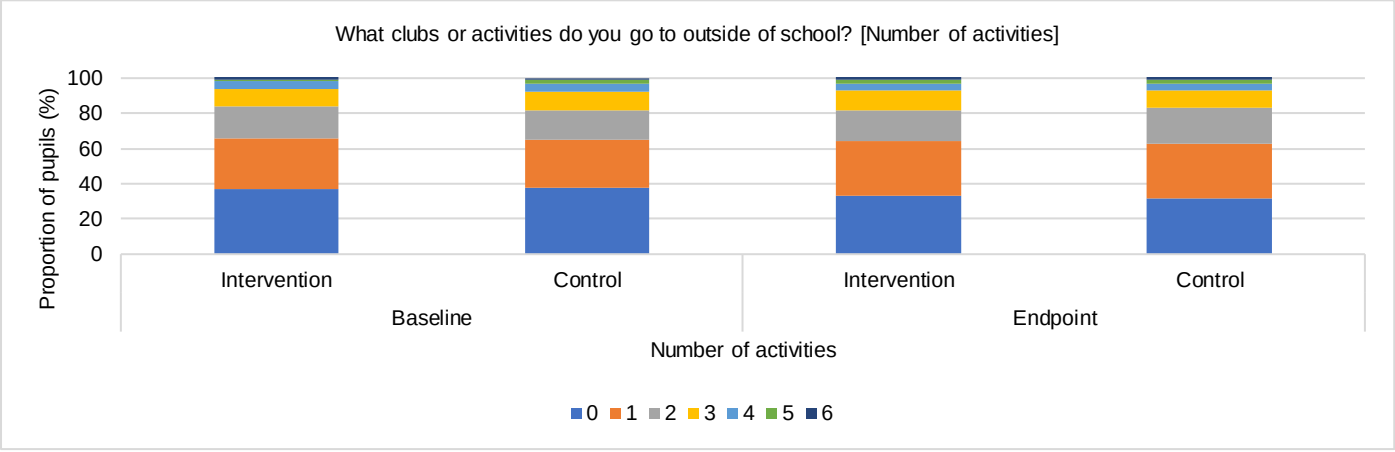


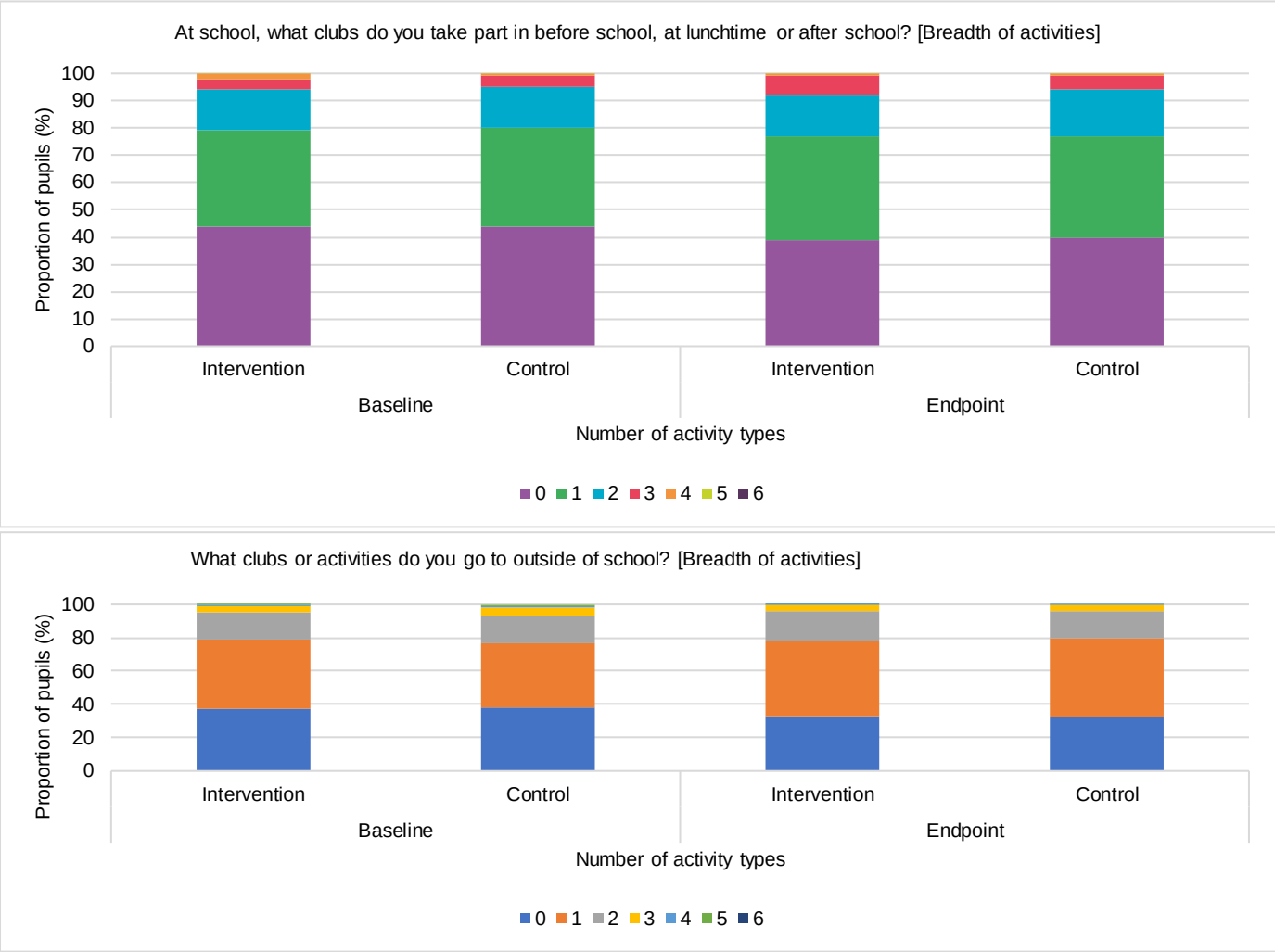
Figure 17: Number of activities reported by volunteer pupils in intervention and control schools at baseline and endpoint



Notes: Data from baseline and endpoint pupil surveys: At school, what clubs do you take part in before school, at lunchtime or after school? And What clubs or activities do you go to outside of school? (n=2,726 at baseline, n=2,273 at endline). Pupils could provide a maximum of six activities in their response.

Breadth of activity participation (as reported at endpoint) was also similar between control and intervention groups, as shown in Figure 18. In both groups it was most common for pupils to take part in one type of activity, with a smaller proportion taking part in two or three different types, suggesting a relatively limited range of activity types. Sports and games were still the most common activity both in-school (54%) and out-of-school (62%), with a slight increase from baseline (48%) seen in the former. However, a similar increase was seen among pupils in control schools (47% to 56%). In-school academic activities demonstrated a notable increase in both intervention and control groups (6% to 17% and 14%, respectively), while generic school clubs saw a drop in popularity (10% to 4%). In-school performing arts remained relatively stable in popularity in both intervention and control groups (16% to 13% and 17% to 16%, respectively). Similar marginal change was also seen with out-of-school outdoor activities (8% to 12% and 8% to 10%, respectively).

Figure 18: Number of activity types reported by volunteer pupils in intervention and control schools at baseline and endpoint



Notes: Data from baseline and endpoint pupil surveys: At school, what clubs do you take part in before school, at lunchtime or after school? And What clubs or activities do you go to outside of school? (n=2,726 at baseline, n=2,273 at endline). Pupils could provide a maximum of six activities in their response.

The frequency of club and activity participation (as reported at endpoint) was also very similar between the control and intervention cohorts. Most of the clubs that pupils participated in took place once a week (81% and 75% of in-school and 59% and 57% of out-of-school clubs in intervention and control schools, respectively). However, out-of-school clubs were more likely to take place more than once a week compared to in-school clubs (35% and 37% compared to 12% and 16% in intervention and control schools, respectively).

Moreover, the majority of control schools (61 out of 74) reported providing upper KS2 pupils with awards or celebrations for their achievements in extracurricular activities over the last two academic years, and over half of pupils (59%) in control schools reported receiving awards or celebrations for taking part in clubs or activities. This is equivalent to the proportion of intervention pupils eligible for a CU participation award according to CUO.

Overall, there appears to be strong similarities between participation in and celebration of extra-curricular activities in control and intervention schools over the trial period. The activities in control schools were not, however, validated by Children's University as structured learning opportunities, nor was pupils' progress in relation to hours of participation recorded in the same way as on CUO. Furthermore, while the celebrations/awards seen in control schools were not CU-specific, it is unclear to what extent the high proportion of in-school CU graduations that occurred differed from the kinds of celebrations that would have occurred in control schools.

Scale-up

Children's University was already being delivered across a wide range of areas prior to this trial using a range of different models. This trial sought to understand the effectiveness of delivering Children's University at scale, including key

elements of centralised support (not usually provided by the Children's University Trust in this way), as well as the implementation of the newly introduced CUO platform. Key features of scale-up that we explored included:

- CUO was developed and all schools were required to use it to record pupil hours, rather than each local CU using their own model.[53]
- Schools received additional support from the Children's University Trust, where outside the trial there is no contact between schools and the Trust.
- Local CUs received additional support and monitoring from the Children's University Trust, where interaction between these parties would otherwise be quite limited.
- Schools did not have to pay to participate in Children's University (with the exception of two local CU areas) and local CUs received additional funding as part of the trial.

IPE_RQ4: What are the facilitators and barriers to delivering at scale (e.g. centralised support to local)? How effective are these facilitators felt to be? What are the implications for further scaling?

- CUO was consistently perceived as a barrier to school engagement, by both schools and local CUs, primarily in terms of the additional workload it was seen to create due to limited pupil ownership—contrary to what the model had intended.
- Local CUs were divided in their perception of the benefit of additional support by the Children's University Trust. Some found it helpful, while others felt it created pressure and restricted their freedom.
- Financial constraints were seen to be the primary barrier to continuing with Children's University in the future.

To what extent was use of CUO a barrier or facilitator for scale-up?

The CUO platform was seen to create significant additional workload for the schools, in large part because it was not possible for pupils to take ownership of their account as had been intended. Three-quarters of CU Coordinators agreed or strongly agreed that leading Children's University had increased their workload (34 and 17 out of 64, respectively). Moreover, while it provided helpful information to local CUs and the trust, it was not seen to carry any benefit for the schools themselves and there were significant concerns about its accuracy among both CU Managers and schools. Several local CU Managers mentioned that they would not make CUO obligatory for schools moving forward, while several schools indicated that they would have to rethink the administrative aspects of the programme and/or receive greater levels of local CU support if they were to continue with it in future. Some CU Managers also noted that using CUO would not be manageable in terms of workload for a whole-school implementation of Children's University, which tends to be the preferred model outside of the trial. Use of CUO appears to require additional support for schools from both local CUs and the Children's University Trust in order to both provide technical assistance and alleviate administrative workload. Some local CU Managers did report that they found CUO helpful for their role because it allowed them to routinely monitor school and pupil activity, thus enabling them to identify at an earlier stage how many pupils were likely to graduate. On the other hand, they noted that the information the platform gathered tended to be beneficial for the needs of the local CU and the Children's University Trust, rather than being useful to the schools themselves. School staff did not report any perceived benefits of the platform for their own use. These challenges likely contributed to the four instances of non-engagement with CUO from whole schools, as well as individual cases of volunteer pupils not appearing on the platform.

To what extent was additional involvement from the Children's University Trust a barrier or facilitator for scale-up?

The Children's University Trust monitored school engagement alongside the local CU Managers using CUO and monthly status reports from local CUs, prompting local CU Managers to provide additional encouragement or support where necessary and/or communicating with schools directly to check whether they needed any additional support and/or

[53] It appears to have been most common for schools to log pupil hours in a spreadsheet that they would then share with their local CU.

remain engaged. The Children's University Trust also helped with some of local CUs' administrative responsibilities (such as adding pupils to CUO) and temporarily took on the CU Manager role during some periods of local CU turnover.

Local CU Managers were divided in their perceptions of the extent to which this additional monitoring and support was beneficial. Some thought it was helpful having the Trust available to provide support if needed and felt the Trust was responsive without being intrusive. Others, however, raised concerns around: pressure to provide updates and meet certain milestones, and to put pressure on schools to achieve this; feeling that the Trust was there to collect information from them rather than to support them; feeling that the Trust placed emphasis on quantity (of hours) over quality (of activities), and felt there needed to be stronger messaging around what kinds of activities should 'count' as a learning opportunity.

Local CU Managers felt it would be helpful for the Children's University Trust to provide more support around: knowledge exchange between different local CUs, engaging and contacting schools; raising awareness among local CUs and schools of activities or events available online or at the national level; and, for some, greater clarity about local CUs ' roles and responsibilities compared to the Trust, as well as timescales.

To what extent was the trial funding model a barrier or facilitator for scale-up?

With the exception of two local CU areas (Wolverhampton and Westminster Children's University),[54] schools had to pay £300 to participate in Children's University as part of the trial. Outside of the trial, local CUs were responsible for determining their own costs and funding arrangements. It was likewise up to schools whether they passed on any associated costs to the parents. Free access to the programme was generally seen by schools and CU Managers to be a facilitator for school engagement as it bypassed any concerns associated with school budgets. Conversely, however, one local CU Manager did suggest that free access may have actually reduced school engagement as they had not financially invested in it.

Local CUs also received additional funding as part of the trial. Some reported that this did not change what they were able to do, while others reported using it to provide additional activities, transport pupils to on-site graduation services, produce material to support external provider validation and purchase additional passports to encourage continued engagement from schools once the trial period had ended. A small number did express concerns about the pressures placed on local CUs, and consequently schools, to meet the trial requirements necessary for accessing the funding, particularly in terms of having CUO data submitted by a particular date.

Financial concerns often emerged as a concern in the feasibility of continuing with the programme. For example, one case-study school said that as a small school with a high proportion of education, health and care plans (EHCPs) they were not in a position to be able to afford the programme. Another case study school said they did not feel the programme was good value for money. Two case study schools also highlighted concerns around the programme not being suitably equitable in its offer, explicitly stating that continuing with the programme would be contingent on seeing a greater impact for disadvantaged children than they had observed during the trial. In addition, the interview data suggests that most schools, if they were to continue with Children's University, would change the delivery model within their school by expanding implementation to reach more year groups and/or shifting the focus of implementation to younger years. Local CU Managers likewise indicated that they prefer schools to have more ownership of how Children's University is implemented within their school.

What are the implications of these findings for future scaling?

Overall, two-thirds of CU Coordinators (42 out of 64) reported that they were satisfied or very satisfied with their Children's University experience during the trial.

[54] This exception is due to schools in these areas being able to access the Children's University programme free of cost outside of the trial.

Most case study schools reported that they were interested in continuing with Children's University in the future, albeit with some key changes to the delivery model. However, there is a strong selection bias here as these schools were deliberately sampled based on high levels of engagement. Some local CU Managers reported instances of schools requesting to sign up additional year groups to the programme during the trial period and/or expressing an interest in continuing with the programme once the trial ended.

Cost

The time costs associated with running Children's University in a school are presented below. The first section recaps how the data was collected and the assumptions that have been made in order to arrive at the resource implications which schools should take into account if they are considering taking part in Children's University. The following sections present the time and financial costs for a school taking part in Children's University.

Data collection and assumptions

Data relating to resources (time and financial) were collected across a subsample of schools at three timepoints using detailed school proformas. The first data point (proforma 1, n=17) collected costs (time and financial) associated with start-up with proforma 2 (n=10) and proforma 3 (n=7) collected data on running the Children's University activities at the end of year one and year two, respectively. Data relating to running activities and those associated with graduations were combined and presented as an average across the two years. Other data collected on costs were from BAU surveys, CU Coordinator surveys and interviews with school staff, local CU Manager and the Children's University Trust staff (see 'Methods' section for details on the data sources).

Several assumptions were necessary in order to generate annual per-school time cost estimates. These are summarised below and the impact of the assumption on the costs estimates is described.

- We have assumed that, outside of the trial, an additional Children's University cohort would start each year. Therefore, although training costs would only occur once in the three-year period, other costs related to the set-up of Children's University in schools occur annually as they would need to be completed for each new cohort of pupils. For the purpose of cost calculations, we have assumed that additional cohorts in years two and three could join in existing activities and clubs. This might underestimate costs, as more students could require additional activities and/or more staff to manage current ones.

- Sourcing and validating of CU activities/clubs:

    - The average number of new (or additional) clubs/activities related to taking part in Children's University was 1.4 (n=66 from the CU Coordinator survey). This is used to calculate the average time needed per school to source and validate CU activities[55]

    - We have used a simplifying assumption that the same level of sourcing and validating of clubs happens every year (so it is treated as a recurring cost) and this happens only on new clubs (those additional activities/clubs schools are undertaking due to taking part in Children's University). During the first year of the programme this is likely to be an underestimate as some existing clubs would also need to be validated. In years after the initial start-up year this is may be an overestimate in terms of time needed. While some activities from year one will not need to be sourced and validated in years two and three, additional cohorts and movement of staff in schools may mean new activities will be added in later years.

    - We have also assumed that all CU activities are sourced, validated, and managed by school staff. In some cases, sourcing and validating may have been undertaken by the local CU Manager.

- Delivering of CU activities/clubs:

    - As estimates of time spent on delivering clubs were provided per session in the proformas we needed to make some assumptions around how many sessions run over each year. We have assumed clubs

[55] Data from CUO suggested that there were 27 activities running each year per school. This is likely to be an overestimate as some activities may have been double counted (e.g. when the same activity was named slightly differently). Responses from the CU Coordinator survey (n=66) suggested that 35% of schools offered additional clubs as a result of taking part in CU. Of these, the additional number of clubs offered per school was 4.1. (n=23). As an average across all schools responding to the survey this is equivalent to 1.4 additional activities per school.

delivered by the school run once a week for a term (13 weeks) in the academic year.[56] This is perhaps likely to be an overestimate as it is unlikely that clubs run from the very first week of a term to the very last. It is also important to note that not all activities will take the format that has been assumed.

- In order to calculate a 'per school' estimate we have multiplied the estimated total time per activity by the average number of additional activities that are run by school staff for no additional payment (one activity per year estimated from the CU Coordinator survey data[57]).

Time

Table 27 summarises the average time needed per school to run Children's University. Time spent on activities related to training (including teacher cover for training) is only needed for the initial year as it is assumed that these staff members remain in post for the following three years (as per the EEF cost guidance; EEF, 2023). The largest time cost is that of staff running the clubs in schools. Some clubs are likely to be run by external agencies so the numbers in the table provide an upper estimate. When considering these estimates for delivery of clubs on a per-session basis they equate to each session taking half an hour to prepare and an hour to deliver for just over two members of staff (as reported in the proformas). We have used the assumption that there are 13 sessions of each activity per year and that a school runs on average of one new or additional activity per year related to their engagement with Children's University. It is also worth noting here there will likely be many other clubs running in schools outside of Children's University that would be running even if the school was not taking part in Children's University so the costs relating to these clubs/activities are not considered additional time costs. CUO data suggested that there are 27 clubs running in CU schools per year. This is likely to be an overestimate as some activities/clubs may be double counted where names of clubs have been reported slightly differently but refer to the same club. All CU Coordinators spent time on training (two to two and a half hours including both the Children's University briefing and Children's University training) and on setting up CUO (four hours). Time spent by the CU Coordinator on other set-up tasks was also relatively low with all the tasks taking around five hours. Maintaining CUO took around 46.4 hours each year (equivalent to 6.6 days per year or 2.2 days per academic term).

In general, where cover was needed for CU Coordinators or other classroom teachers to undertake training or other set-up activities, this was done internally.

In terms of comparison to business as usual, only 13% of CU Coordinators felt that CU-validated clubs took more time to run than non-CU clubs whereas the remaining 88% felt that they took the same amount of time (n=48, excluding responses where CU Coordinators stated they were 'not sure').

Additional time costs (not borne by schools)

Parents

Parents are expected to engage with some elements of Children's University which are additional activities beyond those associated with non-CU clubs, all of which can be considered an in-kind cost in the form of parents' time. Attendance at the parents' briefing and graduation ceremonies are two of these additional activities. Only 27% of CU Coordinators reported having a parent briefing. When there was a parent briefing, the majority of CU Coordinators reported that at least some parents attended. Fifty-seven per cent of CU Coordinators reporting that at least some parents attended the graduation ceremony. Other activities include encouraging/supporting their child to keep their CUO profile up to date, to engage in validated in-school activities/clubs, and to engage in validated activities outside of school (i.e. activities or clubs delivered in the local area). For each of these three activities, between two-thirds and three-quarters of CU Coordinators felt that at least some parents engaged with the activity.

[56] Pupils reported in the pupil survey that 81% of clubs took place once a week and from CUO shows the average difference between start and end of activity log is around 102 days (102/7 = 14.6 weeks) suggesting that an activity runs for a school term.
[57] From the CU Coordinator survey, of those schools which said they had increased the number and/or range of the clubs they offered (n=26), 72% of new clubs were staffed by school staff who were not paid extra. Of the additional 1.4 clubs run by schools on average due to involvement in CU, one of these is estimated to be run by school staff, which are not paid anything additional to do so (72% of 1.4).

Table 27: Time dedicated by school staff to Children's University set-up and delivery per school (assuming delivery over three years)

				Year one		Year two		Year three	
Category	Activity	Staff member	**Frequency across schools**[1]	No. of teachers	**Mode No. of hours** (measure of dispersion)	No. of teachers	**Mode No. of hours** (measure of dispersion)	No. of teachers	**Mode No. of hours** (measure of dispersion)
Training	Staff briefing from Children's University	CU Coordinator	100%	1	1.25 (1 – 3)[2]				
		Class teacher	71%	1	1 .25 (1 – 3)[2]				
	Staff training from Children's University	CU Coordinator	100%	1	1 (1 – 3)				
		Class teacher	63%	1.1*	1 (1 – 3)				
Set-up	Setting up CUO	CU Coordinator	100%	1	4 (0.5 – 8+)	1	4 (0.5 – 8+)	1	4 (0.5 – 8+)
	Information assembly for pupils	CU Coordinator	71%	1	0.5 (0.5 – 2.5)	1	0.5 (0.5 – 2.5)	1	0.5 (0.5 – 2.5)
	Communicating / liaising with parents	CU Coordinator	53%	1	0.5 (0.5 – 4)	1	0.5 (0.5 – 4)	1	0.5 (0.5 – 4)
	Other set-up activities	CU Coordinator	29%	1	4.1 (0.5 – 11)*	1	4.1 (0.5 – 11)*	1	4.1 (0.5 – 11)*
Teacher cover	Internal cover for **training** (to attend briefing and training)	CU Coordinator	34%	1	2.25 (2 – 6)[3]				
		Class teacher	80% (of the schools which had additional class teachers at training)	1.1*	2.25 (2 – 6)[3]				
	Internal cover for **set-up** (setting up CUO)	CU Coordinator	41%	1	4 (0.5 – 8+)	1	4 (0.5 – 8+)	1	4 (0.5 – 8+)
	Internal cover for **set-up** (information assembly for pupils)	CU Coordinator	25% (of the schools that undertook this set-up activity)	1	0.5 (0.5 – 2.5)	1	0.5 (0.5 – 2.5)	1	0.5 (0.5 – 2.5)
	Internal cover for **set-up** (communicating / liaising with parents)	CU Coordinator	22% (of the schools that undertook this set-up activity)	1	0.5 (0.5 – 4)	1	0.5 (0.5 – 4)	1	0.5 (0.5 – 4)
	Internal cover for **set-up** (other set-up activities)	CU Coordinator	40% (of the schools that	1	4.1 (0.5 – 11)*	1	4.1 (0.5 – 11)*	1	4.1 (0.5 – 11)*

			undertook this set-up activity)						
	Internal cover for **preparation**	CU Coordinator	27%	1	1.5 (0.5 – 8.5)	1	1.5 (0.5 – 8.5)	1	1.5 (0.5 – 8.5)
	Sourcing	CU Coordinator	100%	1	0.7 (0.7 – 5.6)	1	0.7 (0.7 – 5.6)	1	0.7 (0.7 – 5.6)
Preparation (activities)	Validating	CU Coordinator	100%	1	0.7 (0.7 – 2.1)	1	0.7 (0.7 – 2.1)	1	0.7 (0.7 – 2.1)
	Preparing for delivery (management)	CU Coordinator	100%	1	0.7 (0.7 – 5.6)	1	0.7 (0.7 – 5.6)	1	0.7 (0.7 – 5.6)
Delivery (programme management)	Maintaining CUO	CU Coordinator	100%	1	46.4**	1	46.4**	1	46.4**
Delivery (activities)	Preparing for delivery (planning)	Class teacher	100%	2.3*[4]	6.5 (6.5 – 65.0)	2.3*[4]	6.5 (6.5 – 65.0)	2.3*[4]	6.5 (6.5 – 65.0)
	Delivering sessions	Class teacher	100%	2.3*[4]	13.0 (6.5 – 52.0)	2.3*[4]	13.0 (6.5 – 52.0)	2.3*[4]	13.0 (6.5 – 52.0)
	Graduation – organising	CU Coordinator	78%	n/a	n/a	1	3.5 (0 – 14)	1	3.5 (0 – 14)
		CU Coordinator	67%	n/a	n/a	1	3.5 (3.5 – 3.5)	1	3.5 (3.5 – 3.5)
Delivery (graduation)		Deputy/ head	33%	n/a	n/a	1	3.5 (3.5 – 3.5)	1	3.5 (3.5 – 3.5)
	Graduation attending	Class teacher	44%	n/a	n/a	1.5[5]	3.5 (3.5 – 3.5)	1.5[5]	3.5 (3.5 – 3.5)
		Teaching assistant	33%	n/a	n/a	1	3.5 (3.5 – 3.5)	1	3.5 (3.5 – 3.5)

Notes:

* *Mean average (rather than mode).*

** Mean average from grouped data in CU Coordinator survey. Responses ranged from 'less than 21 hours' to 'between 189 and 210 hours' per year.

1 *The percentage of schools that undertake the activity. The corresponding time estimates are then based on responses from schools that undertook the activity (i.e. excludes schools that spent zero hours on an activity as they did not undertake it).*

2 *There were two modes for this activity: one hour; and one and a half hours. The mean of these is presented here.*

3 *There were two modes for this activity: two hours; and two and a half hours. The mean of these is presented here.*

4 *This refers to internal staff (some schools used agencies/external organisations). This is based on a mean average of 2.3 staff members per club/activity and an average of 3.7 additional clubs happening a year in a school due to Children's University.*

5 *There were two modes for this number of staff undertaking this activity: one; and two staff members. The mean of these is presented here.*

*Blue shading=second cohort. Green shading=*third cohort

Financial

Data on the financial costs of running Children's University in schools were collected through the school proformas. As shown in the previous section, external cover was not used to cover staff time and staff were not paid extra to deliver clubs in the main. The estimated costs of running the Children's University programme over a three-year period are shown in Table 28. In calculating a per-pupil estimate we have assumed that Children's University programme runs in upper KS2 for three years, beginning in the first year with one Year 5 cohort. In the trial, the costs to schools were the annual subscription fee of £300 and the (non-staff) costs associated with running the CU activities. The costs for activities in Table 28 were generally for resources (including ingredients) and photocopying. The per-pupil cost estimate per school year is £25.90.

Outside of the trial, pupils' CU passports would usually be purchased by the school (£5 per passport). Some schools reported some costs relating to graduations but these are not included in these calculations as the number of schools reporting these costs was very small. Where costs were mentioned they were for transportation and ranged from £10 to £280.

Data collected through the CU Coordinator survey supported the findings from the cost proformas with regard to how clubs were funded. Around 40% of CU Coordinators stated that the number and/or range of activities had increased due to participation in Children's University. Of these, just under threequarters of the additional clubs were run by school staff with no additional payment and just under one-quarter were run by external organisations. Very few schools reported that these additional activities were run by school staff where the staff were paid an additional payment above their salary to run them. Interestingly however, 27% of responding schools in the control group reported that school staff were paid additional pay to run extracurricular clubs at school (n=74). Of the control schools, which did pay staff additional pay to run clubs, the average cost per term to the school was estimated to be £1,451.

Compared to non-CU clubs nearly all respondents felt that CU clubs cost the same to run as non-CU clubs (93%, n=45, excluding those who were 'not sure' or who did not respond).

Additional financial costs (not borne by schools)

Parents

Findings suggest that outside of Children's University, parents pay for around a third of extracurricular activities for upper KS2 pupils and that the clubs run by external facilitators are less likely to be free to attend than those run by school staff.

Other than the costs of the clubs/activities, other possible financial costs to parents involve costs associated with graduation and the costs of the passports. In the trial, the passports used by pupils to record their CU activities were paid for by Children's University but outside of the trial these are purchased by the school (£5 per passport). It was unclear whether the cost of these passports was passed on to parents in general although one local CU Manager felt that there is more buy-in from parents when schools ask parents to make a financial contribution to the costs of the passports and *'it isn't just something they find one day at the bottom of their child's bag'*. Local CU Managers reported that outside of the trial some schools decided not to use passports and would instead just use CUO or use paper passports.

The annual subscription cost to Children's University (£300 per school) is expected to be covered by schools and there was no evidence that these had been passed on to parents

In summary, the most significant time commitment is for school staff who run clubs that offer CU activities, with an estimated half an hour for preparation and an hour to deliver each session. While initial set-up requires considerable time from school CU Coordinators, ongoing maintenance is not significant. There is some time required for parents where they attend CU briefings, graduations ceremonies, and support their child's involvement in CU activities. In terms of financial costs to schools, the main costs are the annual subscription fee, followed by resources and photocopying. The estimated per pupil cost is £25.90. Potential additional costs borne by parents and/or schools include club fees (if delivered by external organisations), graduation expenses, and CU passports.

Table 28: Cumulative costs of Children's University (assuming delivery over three years)

Category	Cost ingredient	Start-up or recurring?	Nominal values			
			Year one £	Year two £	Year three £	Total
Programme costs	Annual subscription	Recurring	£300.00	£300.00	£300.00	£900.00
Facilities, equipment and materials	Miscellaneous costs for activities[#]	Recurring	£79.80	£79.80	£79.80	£239.40
Total additional cost per school						£1,139.40
No. of pupils per school year						44*
Additional cost per pupil school year						£25.90

Notes:

** On average, 26 pupils per school enrolled in Children's University per year (mean average). Here we have assumed that in conditions outside of a trial, a new cohort would begin CU in year two and then in year three of the programme so in years two and three there would be 52 pupils enrolled in Children's University in each school year. The number of pupils on average per year is therefore, x 130 pupil-years 26 in year one, 52 in year two, and 52 in year three) across three years—44 pupils (130/3).*

[#] *Two outliers were removed from this analysis as they were significantly larger amounts than other estimates (both from the same school) (revised n=70 activities).*

Conclusion

Table 29: Key conclusions

Key conclusions
1. Volunteer pupils[58] in Children's University schools made the equivalent of one month's less progress in each of maths and reading, on average, compared to volunteer pupils in control group schools. Given the uncertainty in relation to the effects, the evaluator is unable to conclude that the effects are non-zero. These results have a high security rating.
2. There was no evidence to support that Children's University had an impact on Children's University volunteer pupils' motivation to learn in the classroom and their identification with school compared to their control group peers.
3. Free school meals (FSM)-eligible volunteer pupils in Children's University schools made the equivalent of zero month's progress in maths, on average, and the equivalent of one month's less progress in reading compared to volunteer FSM-eligible pupils in control group schools. Given the uncertainty in relation to these effects, the evaluator is unable to conclude that the effects are non-zero. These results may have lower security than the overall findings because of the smaller number of pupils.
4. Several key features in the logic model were not fully implemented as intended, in part related to ongoing disruption from the Covid-19 pandemic. There were fewer graduations overall, and fewer that took place in civic venues or universities than expected, a limited number of out-of-school validated local destination activities, and challenges with recording activities on CUO. Implementation was not sufficiently distinct from usual extracurricular activity reported by control schools and pupils.
5. Around three-quarters of the surveyed volunteer pupils in intervention schools were proud of what they had learned in their Children's University activities (CU activities) and reported benefits for their teamwork skills (three-quarters), sense of pride (two-thirds), and staying positive (two-thirds). CU Coordinators also perceived a positive impact on pupils' sense of achievement (just over half), although increased confidence and self-belief were noted by fewer than half.

Impact evaluation and IPE integration

What were the primary, secondary, and additional impact findings?

The primary outcomes analyses found, overall, that there was no evidence that the Children's University programme had an effect on pupils' attainment at KS2. The effect size and the 95% CIs for the maths outcome is -0.05 (95% CI: -0.15 to 0.05). Volunteer pupils in the intervention group had slightly lower maths attainment compared to volunteer pupils in the control group. As the CIs straddle zero, the result is consistent with both small positive and small negative effects. Therefore, it cannot be concluded that the effects are non-zero. For reading, the results are effect size -0.09 (95% CI: -0.17 to -0.01); reading attainment for volunteered pupils in the intervention group is lower than for those from the control group. The estimated impact on KS2 reading score is negative and the range of values supported by the data does not include zero after correcting for multiple testing. However, the width of the CIs is larger in relation to the effect size. Due to this uncertainty, it cannot be concluded that the effects are different from zero. As we discuss further below, it is unclear why we have observed this result; there is no apparent reason in either the logic model or the IPE findings. It could be a result related to the false discovery rate (or false 'negative' risk, in this case) (Colquhoun, 2017). Taken together, the results for maths and reading provide no evidence that the Children's University impacts academic attainment at KS2.

There was also no evidence of the Children's University programme having an effect on pupils' non-cognitive outcomes as measured by secondary outcomes. 'Engagement', which measured pupils' motivation to learn in the classroom (effect size: -0.03; 95% CI: -0.13 to 0.08) and 'Valuing of school', which measured their positive identification with school (effect size: 0.00; 95% CI: -0.10 to 0.10). This means, at the end of the trial, the pupils who volunteered in the intervention and control groups had similar levels of motivation to learn in the classroom and positive identification with school. Analyses of other non-cognitive outcomes also suggested that there was no evidence of impact of the Children's University programme on pupils' self-esteem, their goals and aspirations, their problem-solving skills, and communication skills: volunteer pupils in the intervention and control groups had similar scores on these measures at the end of the trial. As per the logic model, it was expected that a positive change in these short-term and intermediate outcomes would then lead to increased attainment in maths and reading at KS2. Given the null effect on the non-cognitive outcomes, it is not entirely surprising that the programme did not have a positive effect on pupils' attainment. However, this does not explain

[58] Children and parents expressed interest in participating in Children's University style activities before randomisation through forms and surveys, creating the eligible volunteer group for the trial.

the observed negative effect on reading attainment, i.e. neither of the short-term outcomes demonstrated a negative programme effect. The reading results do not appear to be supported by the change mechanisms in the programme logic model and as noted above, the uncertainty around the effect would preclude drawing a conclusion of a non-zero effect. When we explored associations between primary and secondary outcomes for intervention group pupils only, we found positive relationships between 'Engagement' and 'Valuing of school' and KS2 maths and reading attainments. Since these are associations and not causal impact, the relationship between these outcomes could be two ways: i) those with higher attainment in general (not as a result of the Children's University programme) may be more likely to be engaged with and value school; and ii) similarly, those who are engaged with and value school more may be more likely to be high attainers. Nonetheless, this may indicate support for the part of the logic model that posits that higher 'Engagement' and 'Valuing of school' may lead to improved attainment at KS2 (or at least that there is a relationship between these constructs) as explored in previous studies (Morris, 2016; Carolan, 2018). Hence, there may be a potential route for Children's University programme to achieving higher attainment by exploring CU activities that support pupils ' engagement with and valuing of school.

What were the findings for disadvantaged children?

The subgroup analyses on disadvantaged children concluded that there was no evidence that the Children's University programme had an impact on KS2 maths (effect size: 0.00; 95% CI: -0.12 to 0.13) and reading (effect size: -0.09; 95% CI: -0.19 to 0.02) outcomes for volunteered children who were eligible for FSM in the intervention group when compared with those in the control group. While the point estimate for reading is negative (-0.09), the uncertainty around the effect size means we are unable to conclude that this effect is non-zero. There was also no evidence to suggest a differential impact of the Children's University programme for volunteered pupils who were eligible for FSM compared to the volunteered pupils who were not eligible for FSM maths (effect size: -0.02; 95% CI: -0.14 to 0.09) and reading (effect size: -0.09; 95% CI: -0.20 to 0.01). However, levels of participation in activities did tend to be lower among disadvantaged pupils, recording an average (median) of 12 fewer hours on CUO compared to their peers. This is in line with the broader trends around extracurricular participation by socioeconomic status that have been observed (Social Mobility Commission, 2019). This may have been due to insufficient *additional* support from schools and local CUs, as support for disadvantaged pupils has mainly been limited to subsidised or free in-school activities available in only half of the schools. Beyond this, schools and local CUs reported only having implemented minimal specific approaches to facilitate participation among pupils eligible for FSM. Moreover, the qualitative evidence suggests that pupils who were already highly engaged with extracurricular activities were seen to be the most engaged with the programme, which would make sense in the context of the pivotal role parents played in determining levels of participation. CU Coordinators' levels of satisfaction with the programme were also notably lower in more deprived schools compared to the rest of the trial sample—further evidence to indicate a lower perceived programme effectiveness for disadvantaged pupils.

How did the number of recorded hours relate to attainment outcomes?

The results from the CACE analysis suggested no evidence of impact on pupils' maths attainment (effect size: -0.07; 95% CI: -0.18 to 0.04). Pupils who recorded 30+ hours of Children's University activities (i.e. who achieved a Bronze award) had, on average, similar KS2 maths scores compared to control group pupils who would have recorded 30+ hours had the Children's University programme been available to them. This was also the case when a continuous compliance measure was considered: pupils who recorded more hours of Children's University activities had similar KS2 maths scores to similar volunteered pupils from control schools (raw co-efficient -0.005; -0.014 to 0.003).

For reading, however, the results were less equivocal: in particular, pupils who recorded 30+ hours (i.e. achieving the Bronze award) had, on average, lower KS2 reading scores than their volunteered peers from control group schools (effect size: -0.26; 95% CI: -0.38 to -0.14). This was also the case when the total number of recorded hours of participation in CU activities was explored (raw co-efficient -0.019; -0.028 to -0.011); for every additional hour of CU activity recorded on CUO, the KS2 reading scaled score declined by -0.019. To put this in perspective, 30 hours of recorded CU activities on CUO would result in a reduction of 0.584 in KS2 reading scaled score. However, similar to our interpretations of the main findings, we are unclear why this would be the case as there are no obvious indications in the logic model mechanisms or IPE findings to suggest that recording CU activities on CUO and participating in Children's University at the level of an award would be detrimental to a child's reading. However, it is important to note the limitations of the sample used for CACE analyses for both subjects. As detailed in the 'Impact evaluation results' section, there are several limitations of CU participation data from CUO. The compliance analyses consider hours recorded until KS2 assessments, which could be underestimated: 27% pupils did not have any CU activities recorded up to this point but may have participated. And, of those 73% who had CU hours recorded, these could be underestimated due to a possible delay in recording participation data for activities completed prior to KS2 assessments. Moreover, the binary CACE estimate applies to a very specific population of pupils—those who participated and

recorded 30+ hours of extracurricular CU activities on CUO before KS2 assessments. The CACE estimate also relies on an 'exclusion restriction' that assignment to the intervention has no effect on pupils that do not meet the compliance threshold of 30+ hours. It is possible that pupils who did not have records of 30+ hours of CU activities may still have participated in CU activity hours, which could in turn influence their attainment.

How were the different types of CU participation related to attainment?

In addition to these results, analyses on the number and diversity of Children's University activities undertaken in the intervention group also showed no associations with attainment. When we analysed the CUO data recorded by the volunteered pupils from intervention schools, we found that taking part in more than six Children's University activities (compared to less than six) or taking part in a diverse range of activities (compared to doing the same type of activities) showed no associations with maths and reading outcomes (i.e. there was no association between the number or diversity of activities and pupils' KS2 maths and reading).

When participation in different types of CU activities was explored within the intervention group, there was no positive association between the activities that focused on 'related' subject content and KS2 attainment (e.g. activities relating to 'STEM' were not associated with KS2 maths attainment and 'Literacy' activities were not associated with KS2 reading attainment). That said, there were a few activities that showed statistically significant associations with KS2 attainment. Among these, 'Online' CU activities were notable, showing positive associations with pupils' attainment in maths and reading. These 'Online' activities were most commonly educational online activities such as tutoring, coding, and other educational online games. Why 'Online' activities should be associated positively with reading, when others, for example, 'Literacy' are not, is unclear. It could be that children who were already higher attaining in maths and reading took part in more 'Online' activities, which might have driven the positive associations that we observed, or perhaps that 'Online' activities involve more engaging reading than other activities. It is also worthwhile noting the limitations of these analyses. The sample for these analyses were restricted to the intervention group pupils only—and so are associations only. Participation in specific types of activities was not randomly allocated to volunteered children in the intervention group.

Why might we have observed these findings?

To help explore the impact results from the trial, we discuss below a number of features of programme delivery and implementation, the logic model, the context in which it was delivered, and the trial evaluation design, to try to understand their relative influence on the results. Coldwell (2018) refers to this as exploring implementation, programme logic, and evaluation 'failures'. We outline these challenges in turn below.

Was the programme delivered as intended?

Several key features of the Children's University programme were not implemented fully as intended. Fewer graduations took place than intended and where they did occur it was often as part of a school celebration rather than as a distinct CU event with other schools at a university or other civic venue. Opportunities for pupils to take part in and/or record out-of-school activities also appears to have been limited due to challenges with validating external learning providers. Furthermore, it appears that parents were not always felt to be able to facilitate extracurricular participation, which may have affected disadvantaged pupils in particular. Additional school support for disadvantaged pupils appears to have largely been limited to subsided or free in-school activities, and even then only in half of schools. Less than half of schools provided parents with additional information or gave them priority access to club places, and only four schools reported funding transport costs. The Theory of Change highlights the important role of parental and school support as enablers of participation; our findings indicate that this is more challenging to implement in practice. Finally, challenges with finding the time for staff and/or pupils to maintain CUO means that it may not have provided the accurate record of pupil extracurricular achievement that was intended. This would mean that pupils would not necessarily receive the award commensurate with their activity levels. Some of these implementation challenges may have, in part, been related to the ongoing difficult context in which the intervention took place (discussed further below).

How distinct was participation in CU to participation in BaU extracurricular activities?

We found that there was little difference in the amount, type, and range of extracurricular activities that intervention and control group volunteers were taking part in. As planned, control schools increased the activities they provided compared to the previous academic year (2020/2021) due to Covid-19 restrictions being lifted. This was also reflected in pupil views (two-thirds of control pupils reported receiving awards or celebrations for extracurricular activities at endpoint). This was the same proportion as the volunteered pupils from intervention schools who recorded activities on CUO and who were eligible for an award. Moreover, more than half of the volunteered pupils from intervention schools did not

attend a CU graduation at endpoint at all and half of the CU graduation events took place in schools, which are seen as similar to the kinds of celebrations in control schools. Taken together, these findings suggest that participation in Children's University may not have been distinct enough from participation in BaU extracurricular activities to achieve the anticipated impacts.

To what extent were the logic model's intended mechanisms demonstrated?

In addition to exploring implementation fidelity above, it may be that the underlying change mechanisms did not take place in the way intended. The logic model posits changes in short-term and intermediate outcomes such as pupils' motivation to learn in the classroom and their positive identification with school, leading to the longer-term attainment outcomes—however, no meaningful impacts were observed on these non-cognitive outcomes.

Indeed, school CU Coordinators reported limited impact on their pupils, with just over one in ten perceiving a positive effect on attainment. The most significant impact noted was an increased sense of achievement (reported by around half of the CU Coordinators), followed by improved confidence and self-belief. That said, pupils themselves reported positive impacts on their teamwork, sense of pride and staying positive from the extracurricular CU activities they had participated in, although only a third of pupils felt they had learned new skills by participating in Children's University. It is unclear why these did not manifest in any of the secondary outcomes measured for the trial, not least self-esteem, one of the most commonly cited by interviewees. The secondary outcomes we measured aligned closely with the logic model, but it would seem that interviewees did not overtly discuss motivation for learning or valuing of school among their perceived impacts. A potential explanation for the null findings regarding these outcomes could be attributed to the likelihood that as part of their planned usual practice control schools also provided awards or celebrations (albeit not CU awards), thereby exerting a similar positive influence on pupils in the control group. Consequently, the perceived increased sense of achievement within the intervention group may not have contributed any more than what was already occurring within the control group.

In the logic model, graduations are posited as key to enhancing children's sense of achievement leading to increased motivation to learn (one of the key outcomes then thought to lead to attainment). Anecdotal evidence from the qualitative research suggests that pupils were highly stimulated and motivated by larger-scale graduation events based at a university. However, not all graduations took place as intended—only two-thirds of schools participated in a graduation ceremony, and almost half of these were in-school ceremonies—limiting this key mechanism. Moreover, there is little support for the mechanism in the logic model that achievement of activity stamps, progression through award levels, and celebration of achievements at graduation ceremonies contributed to increased motivation to learn via greater pride and self-belief. Graduation ceremonies were initially not implemented as intended due to a range of factors, including lower activity hours due to the delayed programme start and impacts of Covid-19, but then this adaptation remained because of financial pressures on schools. The low levels of fidelity to the intended model for CU graduations and other aspects highlighted in this section means the lower implementation fidelity did not distinguish the Children's University programme enough from control group activities (see above), which in turn may have contributed to not achieving the intended impacts on pupil outcomes.

There is also evidence to suggest that other crucial mechanisms for translating the activities and outputs into the intended outcomes did not play out in practice and tended to disadvantage those pupils who could have benefited the most. The assumption that parents would 'minimise barriers' to children's participation in these activities did not appear to be universally the case. Even where parents were engaged, it could be that they may not have had the capacity to overcome the barriers (financial, geographical, etc.) faced. Moreover, as school communication with parents appears to have been moderately low, it is likely that parental facilitation of extracurricular participation continued as it would have done beyond the programme. This may mean that pupils who were already supported to engage with extracurricular activities would also be supported to engage in CU activities, while those with limited parental willingness or capacity to support would continue to face the same barriers.

What moderated effective implementation?

The potential moderators identified in the logic model were largely supported by the trial findings. The level of whole-school support for the programme was identified as key for both implementing it within the school and pupil engagement, with the role of the CU Coordinator being particularly crucial. Regular contact with the local Children's University was likewise seen to be an important facilitator for schools. Parental availability, engagement, and support appears to have been a key determining factor for pupil participation, in combination with any challenges faced in relation to access to and cost of activities. However, it is less clear the extent to which progression through award levels may have acted as

a moderator, as more hours of activities were not found to be associated with greater academic progress. On the other hand, it is possible that graduation ceremony attendance may be a key moderator as this was an area of low fidelity.

What context and conditions did the trial take place in?

One moderator not predicted by the logic model were the contextual challenges related to the Covid-19 pandemic. The trial started when schools were still facing considerable disruption as a result of the pandemic and associated restrictions. Many CU Managers reported that there were fewer extracurricular opportunities on offer in the first year of the trial compared to usual practice due to reduced staff capacity and restrictions on visitors to the school and school trips. Adaptations were also made to the programme in response to restrictions and concerns relating to Covid-19. This included virtual briefing sessions and in-school graduation ceremonies. While the effects of the pandemic appear to have been less prominent in the second year of the trial, a third of CU Coordinators still reported that their school was prioritising academic 'catch-up' over extracurricular activities at the end of the trial. The cost-of-living crisis that followed the pandemic was also seen by CU Managers to have exacerbated the financial barriers to extracurricular participation that many families were already facing.

The trial involved several implementation conditions that would not normally be seen in practice. Participation was within a single year group per school, and IPE findings suggest that this created additional barriers for engagement where implementation was particularly vulnerable to staff turnover, as responsibility for the programme lay with a single individual. School staff felt that, had participation involved multiple year groups this could have built momentum through whole-school engagement and greater staff willingness to support provision of extracurricular activities.

The trial also took place over a slightly shorter period than previously studied (five terms rather than six). Local Children's Universities reported that it could take some time to build up momentum and engagement within a school and suggested that the trial period was insufficient for the programme to embed itself within the school community.

On this trial, CUs were each working with a small number of schools, randomised into the intervention group for the trial. Participating schools noted some isolation in their programme delivery, desiring more networking opportunities with other participating schools, local education providers, and activity providers. Local CU Managers noted that the programme thrives when schools cluster within the same area, but trial schools were often dispersed across remote areas, making it challenging for local CUs to provide the optimum support and visit them due to time and cost constraints. Additionally, the location of some schools posed barriers for school trips and external graduation ceremonies, although local CU initiatives supported schools in overcoming these challenges by funding transportation to university campuses.

The above all point to helping to explain a null result or no evidence of impact (as we observed for maths). That is, the combination of low fidelity, insufficient distinction to usual extracurricular activity, limited perceived impacts, key mechanisms not played out in practice, as well as the Covid-recovery context, and some of the trial conditions, indicate that implementation may not have been as effective as intended. These implementation challenges may, in turn, have affected the potential promise of the intervention to achieve its desired outcomes.

However, even with these challenges, it is unclear why we observed a small negative impact for reading. There was no evidence in the IPE to indicate that doing CU activities diverted children's attention from their usual reading habits. It could be a result related to the false discovery rate (or false 'negative', in this case, risk). False discovery is when we conclude there is an effect when there is, in fact, no such thing. When we use $p<0.05$ to conclude there is an effect, we will be wrong at least 30% of the time (Colquhoun, 2017). Besides, the reading result has larger width of the CIs in relation to the effect size. Taken together, these results strengthen inconclusiveness regarding a non-zero effect.

How do our findings relate to the existing evidence?

Previous studies (such as Cummings *et al.,* 2012; Tanner *et al.,* 2016) highlighted evidence of a small positive impact of extracurricular activities or after-school clubs on both attitudes and educational attainment. However, current evaluation does not corroborate with these findings. The part of the logic model does support some evidence of positive association that was explored between non-cognitive outcomes and attainment outcomes explored in Morris (2016) and Carolan (2018). The EEF's Teaching and Learning toolkit summarises evidence of impact of physical activity and performing arts activity on pupil outcomes. Incidentally, these two activity types were also two of the most popular activities offered by intervention schools in this trial. While the toolkit highlights a positive link between physical activity and academic attainment, this was not evident in this current evaluation. From the toolkit, the measured impact on attainment also varies considerably between different interventions, and participation in sports does not straightforwardly transfer to academic learning. The toolkit also suggests that participating in after-school clubs or summer programmes

that blend sports with regular teaching in reading and maths is found more helpful for learning than just doing sports. Similarly, the toolkit summarises positive but moderate impact of arts participation on English, maths, and science. It reports that participation in such activities lead to benefits on children's attitudes to learning and increased well-being. However, in the current evaluation, despite performing arts being one of the most commonly offered CU activity, it did not show any evidence of impact on pupils' non-cognitive or academic performance. This may be due to the frequency or intensity of children's participation in such activities as part of CU or it could be the absence of identifiable aims of such activities or a learning link between these activities and pupils' academic attainment.

The efficacy trial that evaluated the Children's University programme in developer-led conditions showed some promising results in 2017. The intervention was delivered to Year 5 pupils for two years and Year 6 pupils for one year. Children from both groups of schools volunteered to take part in Children's University in a pre-randomised survey. This formed the analysis cohort for the trial. The Year 5 volunteer children in intervention schools made an additional two months' progress in reading and maths compared to children in control schools. Children in intervention schools also made small gains in social responsibility and teamwork. Children ever eligible for FSM made less progress: one additional month in maths and no additional progress in reading (effect sizes of 0.1 for maths and effect sizes of 0.16 for reading). However, the findings come with caution as it had a moderate security rating (3 padlocks) for maths and a low to moderate security rating (2 padlocks) for reading results. These were due to the concerns of imbalance between the intervention and control groups (effect sizes of 0.1 for maths and effect sizes of 0.16 for reading). This means the intervention group was well ahead on most measures at the outset, this was particularly true for reading. The headline findings were presented in progress scores rather than a comparison of intervention and control groups at endpoint and this presentation of findings is not in accordance with what is usually found in the EEF's toolkit. Further analyses also suggested that all Year 5 children in intervention schools made better average progress than children in control schools, regardless of their actual level of CU participation. The trial highlighted this as another caution to the headline result as to the extent to which gains were due to the direct involvement in CU activities.

The positive results from the efficacy trial did not hold true when the intervention was evaluated at scale in the effectiveness trial. Both evaluations analysed the programme effect on KS2 results. The efficacy trial evaluated it after two academic years whereas the intervention length was slightly shortened to five academic terms in the effectiveness trial in agreement with the EEF and the Children's University Trust that this would not be unduly detrimental to being able to take part or achieve Bronze awards. The volunteer selection process differed between the two evaluations. In the efficacy trial, only pupils were asked to volunteer for a programme like Children's University. However, there was a concern about the participation rates if parents were unaware of this opportunity and thus, could not support their child. To address this concern, in this evaluation parental consent was sought alongside explicit guidance to teachers to ensure all pupils responded to the volunteering question in the survey, aiming to increase participation in Children's University activities. Another difference between the two evaluations was the focus on the non-cognitive outcomes. The current evaluation used existing validated and age-appropriate scales to measure the secondary outcomes, and using baseline data, we selected the two most robust scales (and analysed the remaining two in exploratory analysis): the impact on pupils' motivation to learn in the classroom; and their identification with school. The efficacy trial measured social responsibility and teamwork using individual items only. The efficacy trial did not use CUO, nor was it affected by Covid-19, two of the barriers to effective implementation in this trial. Moreover, varied levels of school engagement had already been observed at the efficacy stage, with some concerns expressed regarding whether the programme offered value for money, particularly when the additional burden for staff was taken into account. This sentiment was expressed by several schools in this trial as well.

Limitations and lessons learned

This evaluation is the largest randomised study that has evaluated the impact of Children's University programme to date. The primary outcome measures used administrative KS2 data with only a very small amount of attrition so it is highly unlikely that results would be biased results due to missing data.

The secondary outcomes (non-attainment) were created using validated, standardised, and age-appropriate established scales and these aligned well with the programme logic model too. However, the sequence of measuring short-term and long-term outcomes was contrary to the causal relationship as per the logic model. The KS2 outcomes were measured before the secondary outcomes, which took place only towards the end of programme delivery to capture the maximum effect. If we had measured the secondary outcomes prior to KS2, we would have only measured the impact of four academic terms of programme implementation on these outcomes. Another limitation may be the main evaluation

research questions being the attainment outcomes, which were long-term and perhaps with a weak causal pathway although in this case there was no impact even for the non-cognitive outcomes, which were described as short-term and intermediate.

Another potential limitation of the impact analyses is the use of the Bonferroni correction, which is a conservative correction method as it does not account for correlated outcomes. We had planned to use the Romano-Wolf correction, which overcomes this limitation. When we implemented the Romano-Wolf correction, the analyses models did not converge. Nevertheless, we expect that the Romano-Wolf correction p-values would have been somewhere in between the Bonferroni ones reported here and the uncorrected values and so would not have impacted headline findings as the point estimate would remain the same and the corrected p-values would have been slightly smaller.

One of the limitations of the programme was the recording of CU participation on the CUO platform, and potential under-recording of activities. Of the 81 intervention schools, 77 had at least one pupil recorded in the CUO data (95%), and 33 schools (41%) had all their volunteered-pupil records appear on CUO. Over three-quarters of the volunteered pupils from intervention schools recorded activities on CUO; meaning just under one-quarter did not record any hours. These were either pupils who did not take part in CU activities or did not use CUO and the limitation is that we do not know which, apart from the four schools that did not use CUO at all (2.5% pupils). The under-recording was also observed by our own investigation of CUO data (i.e. delayed recording in the May extract, which was used for compliance analysis, see below) and also confirmed by the interviewees (i.e. some under-recording in general). There is some evidence from the IPE findings that suggests CUO may not have captured all the CU activities children were participating in. Reports from just under half the CU Coordinators (29 out of 66) suggest that CUO did not accurately capture all the activities the pupils had participated in and the interview data indicates that difficulties with validating external learning providers meant the CUO data did not accurately reflect the quantity of extracurricular activity each child was participating in (although we note that not all out-of-school activities are intended to be CU validated anyway). Taken together, this means CUO may somewhat under-report what pupils did. Further inconsistency within the data will have also been introduced by each local Children's University taking a different approach to address this—for example, some created generic codes for these activities while others did not. Different local Children's Universities also took different approaches to validation, with some being quite liberal around, which activities could be counted for the programme, while others were more stringent about what represented a genuine learning opportunity. While overall the number of hours achieved by pupils is perhaps lower than anticipated (less than half achieved 30+ hours, for example), the shape of the distribution of CU hours on CUO looks reasonable. By the end of July, 42% of pupils had over 30 hours of CU participation, a handful had a much larger number of hours, and 22% had a smaller number of hours (one to ten hours of CU participation).

The compliance analysis used May CUO records (until KS2 assessments), which had the potential under-recording of CU participation data. Of the total recorded CU hours, only around 31% cumulative CU participation hours were recorded in the weeks leading up to the KS2 assessments (median nine hours) compared to (median 17 hours) by the end of term in July. This means the CU participation hours used for the compliance analysis (recorded up until the KS2 assessments) are most likely underestimated as 69% hours were recorded after the KS2 assessments were completed. This could be due to pupils participating in more activities after the KS2 assessments (some of which is plausible given pupils may have more time available after their assessments to take part in extra activities), or delays in recording hours for activities completed before the assessments. Another limitation is the interpretation of compliance analyses where for one of the analyses, the estimate demonstrates the average difference in impact between pupils with 30+ hours of recorded CU activities and control pupils that would have recorded 30+ hours, had CU been available to them. This means the CACE estimates only apply to a very specific population of pupils (those who participated and recorded 30+ hours of CU activities before KS2). Here, the CACE estimate also relies on an 'exclusion restriction' that assignment to the intervention has no effect on pupils that do not meet the compliance threshold of 30+ hours. It is possible that pupils who did not have records of 30+ hours of CU activities may still have participated in CU activity hours, which could in turn influence their attainment. In addition to this, CACE estimates also rely on an 'exclusion restriction' where assignment to the intervention has no effect on pupils that do not meet the compliance threshold of 30+ hours. Therefore, it is possible that pupils who did not have records of 30+ hours of CU activities may still have participated and recorded some CU activity hours, which, in turn, may have influenced their attainment.

There are likewise several potential limitations to the IPE analysis, primarily as a result of the sample. While response rates to the surveys were very high (ranging from 81% to 89%), it is possible that the least engaged participants may not be represented. Using CUO data, we attempted to engage 'low engaged' schools in interviews to understand any implementation challenges—however, we were only able to conduct one of ten interviews due to poor response rates

from such schools. We conducted six case studies, as planned (restricted by the budget), but acknowledge this is a small number and the data may not be reflective of all intervention schools' experiences. In addition, pupils in the focus groups were selected by their teacher, not at random, which most probably introduced a further selection bias based on levels of engagement with the programme.

Recommendations for the programme

Based on the evaluation findings, here are some programme recommendations for the future:

- The programme logic model could be strengthened especially for short-term and intermediate outcomes, by clearly outlining each causal pathway and considering potential unintended consequences. The logic model should ensure that it captures outcomes directly related to 'Sports and physical' activities as well as 'Arts, culture, and music' activities as these were the two most prevalent CU activity types.

- In future, the programme differentiation could be more pronounced to define how the Children's University offer is different from other extracurricular activities. There needs to be more work to get children to take part in activities outside classroom that have specific learning aims, including validating those activities. More rigorous validation criteria may be needed to match structured learning activities with clearly defined learning outcomes. This approach will help distinguish Children's University from other extracurricular activities.

- The Children's University Trust should enhance support specifically for disadvantaged pupils, particularly addressing barriers like parental engagement and family finances. They should reflect on costs for schools and whether these could be reduced to encourage participation, particularly from more deprived schools.

- CU graduations were enjoyed by pupils and perceived by school staff to raise pupils' aspirations and foster a sense of achievement. Graduations at external institutions with other schools in attendance, as intended by the Children's University Trust, is a primary point of differentiation between the programme and usual practice. The Children's University Trust should ensure that these ceremonies are held as intended and reassess the balance between in-school and external graduations and consider ways to encourage schools to engage with external graduations—such as funding transport to and from the venue.

- The Children's University Trust should consider whether the *process* for validating external learning providers could be simplified to engage external providers more and to enable children to more consistently record their out-of-school activities.

- The Children's University Trust should adapt the CUO platform to reduce the workload burden that CUO currently places on schools. The platform should be adapted to ensure it is user-friendly for children so that school staff are not responsible for maintaining the records and pupils are able to observe their progress towards award levels, as the programme theorises this as a key motivator. The Children's University Trust should also consult with schools about the kinds of information that it would be helpful for the platform to capture, to ensure it adds value for school staff as well as Children's University.

- Additionally, CUO records of participation data (hours) should be linked with data on graduations or awards (and not separate) to ensure that awards are consistently and accurately based on pupil participation.

- If the Children's University Trust wanted to assess the impact of CU participation on pupil outcomes by each activity type, CUO could be designed so that each activity is linked to a single, distinct activity type from a pre-defined list. This could make it easier to discern effects of specific activity types.

Future research and publications

Further research should test whether the causal pathways from inputs lead to the anticipated short-term outcomes, before going on to measure the longer-term outcomes such as attainment. This might help to highlight, which of the many non-cognitive areas have the most promise and therefore, which to focus on in any further programme development. Given the uncertain results but potential positive associations between online CU activities and maths and reading outcomes, further research should also focus on understanding, which types of CU activity are most beneficial for which outcomes. Since the programme closely resembled usual practice and did not show an impact on outcomes, it is important to identify unique features of the programme (as distinct from business as usual) and explore

how to enhance these. It would also be valuable to explore how much extracurricular activity is required to achieve a meaningful impact.

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Appendix A: EEF cost rating

Cost rating	Description
£ £ £ £ £	*Very low:* less than £80 per pupil per year.
£ £ £ £ £	*Low:* up to about £200 per pupil per year.
£ £ £ £ £	*Moderate:* up to about £700 per pupil per year.
£ £ £ £ £	*High:* up to £1,200 per pupil per year.
£ £ £ £ £	*Very high:* over £1,200 per pupil per year.

Appendix B: Security classification of trial findings

OUTCOME: ***Maths***

Please use this template to assign a separate security rating for each primary outcome. Secondary outcome analysis and/or subgroup analyses are NOT included in the security ratings unless otherwise stated.

Rating	Criteria for rating			Initial score		Adjust		Final score
	Design	**MDES**	**Attrition**					
5	Randomised design	<= 0.2	0-10%	**X**				
4	Design for comparison that considers some type of selection on unobservable characteristics (e.g. RDD, Diff-in-Diffs, Matched Diff-in-Diffs)	0.21 - 0.29	11-20%					**X**
3	Design for comparison that considers selection on all relevant observable confounders (e.g. Matching or Regression Analysis with variables descriptive of the selection mechanism)	0.30 - 0.39	21-30%			Adjustment for threats to internal validity **[-1]**		
2	Design for comparison that considers selection only on some relevant confounders	0.40 - 0.49	31-40%					
1	Design for comparison that does not consider selection on any relevant confounders	0.50 - 0.59	41-50%					
0	No comparator	>=0.6	>50%					

Threats to validity	Risk rating	Comments
Threat 1: Confounding	Low	Adequate allocation, no evidence of serious between group imbalances. Statistical controls employed.
Threat 2: Concurrent Interventions	Moderate (likely to underestimate the effect of the intervention)	Concurrent interventions are explored – there are other similar activities taking place in both intervention and control, but this seems to be similar across groups. The evaluation found that there was insufficient distinction from usual extracurricular activities in control schools. This blurs the lines between intervention and control as well as between CUO activities and BaU in the

		intervention schools making it difficult to tease out the unique contribution of the planned intervention to outcomes (above and beyond what is already being delivered).
Threat 3: Experimental effects	Low	No evidence of experimental effects – the potential threat of similar activities in the control group is accounted for above.
Threat 4: Implementation fidelity	Moderate (likely to underestimate the effect of the intervention)	Implementation fidelity is well defined, aligned with the logic model and very comprehensively explored. The intervention was not delivered with high fidelity and reporting of the intervention by schools was poor in general.
Threat 5: Missing Data	Low	Total missing data is low; no differential between treatment and control; missing data analysis similar to complete-case analysis.
Threat 6: Measurement of Outcomes	Low	Valid and reliable NPD data was used for baseline and outcome testing points.
Threat 7: Selective reporting	Low	Study registered and protocol and SAP published.

- **Initial padlock score:** [5] Padlocks – A very well conducted trial which meets all the criteria for 5 padlocks (a sufficiently powered RCT with attrition below 10%)
- **Reason for adjustment for threats to validity**: [-1] Padlocks – two moderate threats identified both of which are working in the same direction.
- **Final padlock score:** initial score adjusted for threats to validity = [4] Padlocks

OUTCOME: *Reading*

Please use this template to assign a separate security rating for each primary outcome. Secondary outcome analysis and/or subgroup analyses are NOT included in the security ratings unless otherwise stated.

Rating	**Criteria for rating**			**Initial score**		**Adjust**		**Final score**
	Design	**MDES**	**Attrition**					
5	Randomised design	<= 0.2	0-10%	**X**				
4	Design for comparison that considers some type of selection on unobservable characteristics (e.g. RDD, Diff-in-Diffs, Matched Diff-in-Diffs)	0.21 - 0.29	11-20%			Adjustment for threats to internal validity **[-1]**		**X**
3	Design for comparison that considers selection on all relevant observable confounders (e.g. Matching or Regression Analysis	0.30 - 0.39	21-30%					

	with variables descriptive of the selection mechanism)							
2	Design for comparison that considers selection only on some relevant confounders	0.40 - 0.49	31-40%					
1	Design for comparison that does not consider selection on any relevant confounders	0.50 - 0.59	41-50%					
0	No comparator	>=0.6	>50%					

Threats to validity	**Risk rating**	**Comments**
Threat 1: Confounding	Low	Adequate allocation, no evidence of serious between group imbalances. Statistical controls employed.
Threat 2: Concurrent Interventions	Moderate (likely to underestimate the effect of the intervention)	Concurrent interventions are explored – there are other similar activities taking place in both intervention and control, but this seems to be similar across groups. However, it blurs the lines between intervention and control as well as between CUO activities and BaU in the intervention schools making it difficult to tease out the unique contribution of the planned intervention to outcomes (above and beyond what is already being delivered).
Threat 3: Experimental effects	Low	No evidence of experimental effects – the potential threat of similar activities in the control group is accounted for above.
Threat 4: Implementation fidelity	Moderate (likely to underestimate the effect of the intervention)	Implementation fidelity is well defined, aligned with the logic model and very comprehensively explored. The intervention was not delivered with high fidelity and reporting of the intervention by schools was poor in general.
Threat 5: Missing Data	Low	Total missing data is low; no differential between treatment and control; missing data analysis similar to complete-case analysis.
Threat 6: Measurement of Outcomes	Low	Valid and reliable NPD data was used for baseline and outcome testing points.
Threat 7: Selective reporting	Low	Study registered and protocol and SAP published.

- **Initial padlock score:** [5] Padlocks – A very well conducted trial which meets all the criteria for 5 padlocks (a sufficiently powered RCT with attrition below 10%)
- **Reason for adjustment for threats to validity**: [-1] Padlocks – two moderate threats identified both of which are working in the same direction.
- **Final padlock score:** initial score adjusted for threats to validity = [4] Padlocks

Appendix C: Changes since the previous evaluation

Appendix Table C1: Changes since the previous evaluation

	Feature	Pilot to efficacy stage	Efficacy to effectiveness stage
Intervention	Intervention content	No changes; although note 'social action' (e.g. volunteering or doing charitable work) was an emphasis in the efficacy trial as that was part of a funding round related to social action.	Social action is not an emphasis in the effectiveness trial.
	Delivery model	Changes to the way pupils volunteer. Only pupils, and not parents or teachers, were asked to indicate whether they would like to volunteer to take part in a programme like CU.	In this trial, the aim was to boost the number of volunteers who were likely to go on to take part in the intervention by involving teachers and parents in the recruitment, to identify pupils with an interest in CU activities. In addition to the pupil surveys, parents were also sent expression of interest forms to encourage dialogue between the parent and the child so that the child could make an informed indication to take part in the Children's University programme. Teachers were sent a guidance document at the same time to encourage children to respond to the volunteering question in the pupil survey.
	Intervention duration	Two academic years – six academic terms	Five academic terms
valuation	Eligibility criteria	Participating schools were from the north of England (Lancashire and Middlesbrough).	This trial included schools from 11 CU localities from different regions than that of the efficacy trial, spread across the UK. This trial had only have one cohort where we followed the Year 5 (2021 cohort) through to their Year 6 as this enabled the local CUs to support schools in targeting activities for a single year group and the evaluation to measure an impact of CU participation over two years rather than only one year.
	Level of randomisation	No change: school-randomised trial.	
	Outcomes and baseline	Primary outcomes remain the same Secondary outcomes were teamwork and social responsibility. These were each measured by single items from a bespoke pupil survey developed by the efficacy evaluator in collaboration with developer(s) and the EEF, especially for use in a number of trials. The instrument contained a set of single-item questions scored on a scale of 1–10, covering teamwork, communication, motivation, self-esteem, confidence, resilience, civic mindedness, and future intentions. These items were taken from validated instruments, or provided by the Office for National Statistics, reviews of the literature, prior studies by the evaluators, or professional advice.	Secondary outcomes in the effectiveness trial were based on validated subscales from published instruments, in order to measure a range of concepts relevant to the logic model. They were existing validated subscales from published instruments, incorporated into one survey instrument. They were increased motivation to learn and increased positive identification with school, as measured by the 'Engagement' and 'Valuing of school' subscales from the Panorama SEL measure (Panorama Education, n.d.)
	Control condition	Control condition remains BaU.	

Appendix D: Effect size estimation

Appendix Table D1: Effect size estimation

			Variance components obtained from a model with no predictors		
Outcome	Unadjusted differences in means	Adjusted differences in means	Between-school variance σ_S^2	Within-school variance σ_{error}^2	Effect size denominator $\sqrt{\sigma_S^2 + \sigma_{error}^2}$
KS2 maths score	-0.53	-0.35	6.35	52.70	7.68
KS2 reading score	-0.95	-0.71	4.78	55.90	7.79
Engagement	-0.11	-0.09	1.39	12.87	3.78
Valuing of school	0.00	-0.05	0.89	9.22	3.18

Further Appendices

A further document of additional appendices is available separately on the EEF webpage.

This document is available for download at https://educationendowmentfoundation.org.uk

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