Motivated to achieve

How encounters with the world of work can change attitudes and improve academic attainment

Education and Employers Research

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WITH THE KIND SUPPORT OF CET Commercial Education Trust

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Foreword

Julie McCulloch | Director of Policy
Association of School and College Leaders (ASCL)

Motivating 16-year-olds to study is a subject currently extremely close to my heart. As I write, my Year 11 daughter is sitting across the dining room table from me, her chemistry textbook and a large mug of tea in front of her. Her initial horror at her school's suggestion that she should spend four hours a day over the Easter holidays revising has subsided into a quiet determination to do what she needs to do, and to get her four hours out of the way this morning so she can meet her friends in town later with a clear conscience.

Reading this report, I reflect, as I often do, on how lucky Ella is. Our Easter Sunday was spent with a group of friends, with children of similar ages. Inevitably, talk turned to their plans for the future. Ella is, at least at the moment, interested in medicine. 'OK,' said our GP friend, 'Let me talk to you about what I do, and how I got here'. 'So what A levels are you thinking of taking?' asked another friend, who works in university admissions, before talking in detail about what universities do and don't value in potential medics.

That Sunday lunch provided not only a welcome break from revision and invaluable advice on next steps but, crucially, a motivational boost to hit the books again the next day.

School leaders are all too aware of the advantages that access to this type of social capital can give their students. 'You can't be what you can't see' is a truism, and clearly many people achieve great things from humble beginnings. But we know that we are a very long way from achieving the type of social mobility (or, even better, social justice) that we would like to see in the UK – and that schools play a crucial role in opening young people's minds to possible futures ahead of them.

What is so exciting about this research is the tangible link it found between increased careers guidance and educational outcomes. School leaders constantly need to juggle priorities. They need to prepare students for exams while still providing them with the sort of broad, rich curriculum to which they are entitled. They need to help students to succeed in the here and now, while ensuring they also look beyond today's pressures to tomorrow's opportunities.

But these priorities needn't, suggests this study, be in conflict. Raising young people's aspirations, helping them to imagine futures they may never have considered, can be a powerful motivator – particularly for those students without the social and cultural capital enjoyed by my own aspiring doctor.

John Hillier | Former Trustee and Senior Advisor
Commercial Education Trust (CET)

Careers education is the Cinderella of the curriculum – often neglected as schools focus on raising academic standards. Yet most educators will probably agree that young people preparing to enter today's fast changing labour market are in need of high-quality careers education and guidance. Careers education at its best involves employers. And there is plenty of research evidence suggesting that engagement with employers can improve students' attainment – not least by helping them understand how what they learn at school relates to the world of work. So, could employer involvement specifically in careers education have a positive impact on educational outcomes?

'Motivated to achieve' explores this question and forms part of CET's ongoing support of research into how best to build the knowledge, skills and attitudes young people need for employment, self-employment and enterprise. The research team found that just three 20- to 30-minute career talks delivered by volunteers from the world of work from a variety of sectors made a real difference to Year 11 students.

The results show that, far from being somehow at odds with the imperative to raise academic standards, careers education that brings young people into contact with employers can actually raise those standards.

The finding that even short interventions have an impact should be especially encouraging for small- and medium-sized enterprises that may wish to work with schools but are held back by a perceived lack of time and resources.

For CET, this study marks an important step forward in our understanding of the relationship between employer involvement in education and pupil performance. We are particularly delighted by the beneficial effects the career talks had on lower-achieving pupils. While the modest impact on GCSE performance identified in the study may seem disappointing, our view is that this tells us as much about the inadequacies of our public exams as about pupils' achievements. We feel there is a clear need for a better way of capturing what pupils have learnt that is relevant to work.

Further research is needed on how this can be done in ways that are accessible to employers and other stakeholders. Future studies could also explore whether frequent career talks delivered over several years could increase the academic benefits identified by the research described in this report.

Meanwhile, we thank researchers Elnaz Kashefpakdel, Christian Percy and Jordan Rehill from Education and Employers, and hope you enjoy reading the report.

Contents

Contents page

Executive summary

For the first time in England, using a robust methodological approach – a randomised controlled trial (RCT) – links have been demonstrated between young people's engagement with the world of work through career talks and their GCSE attainment.

This builds on previous research over the last 10 years by the charity Education and Employers, which has found:

1. Independent schools have extensive links with employers and use those ties to give students advantages in their transitions out of school, including for university admissions (2012).
2. Employer engagement reduces the likelihood of becoming NEET (not in education, employment or training). Young people who do four or more activities during secondary school are less likely to be NEET during their 20s. This insight has driven the commitment in the Department for Education's 2017 *Careers Strategy* that every young person should have a meaningful encounter with employers whilst in secondary education (2013, 2017).
3. Employer engagement during school years increases the amount young adults earn once in full-time employment (2014, 2016, 2017).
4. Employer engagement has an impact on student motivation by linking the curriculum to the world of work (2018).
5. Career gender stereotyping exists, and it can be tackled from primary school onwards (2018, 2019).

Academic Attainment

The charity Education and Employers have long believed there is a relationship between young people's encounters with the world of work and academic attainment. Various surveys of head teachers have shown they strongly believe something important happens to young people when they engage with people from the world of work.[1] And anecdotal evidence from surveys of teachers shows that they believe meeting volunteers from the world of work helps young people to see the value of education, translating into motivation to study harder for their exams.

This new research shows that participation in career talks with volunteers from the world of work can change Key Stage (KS) 4 pupils' attitudes to education, influence their future plans and subject choices, motivate them to study harder, and support an improvement in academic attainment, even when taking place only a few months before their exams start. Such links have previously been identified in studies of (Organisation of Economic Cooperation and Development (OECD) and United States (US)_ data.[2] While the effects are modest and indicative and need further exploration as part of a larger trial, this is an important finding, especially given the small costs involved in putting on three career talks.

[1] See, for example, findings of a joint Education and Employers survey with TES and National Association of Head Teachers in 2018. https://www.educationandemployers.org/wp-content/uploads/2017/08/Primary-teachers-perception-Headline-Stats-Final.pdf

[2] https://educationendowmentfoundation.org.uk/public/files/Employer_Engagement_in_Education.pdf https://www.routledge.com/Essays-on-Employer-Engagement-in-Education/Mann-Huddleston-Kashefpakdel/p/book/9781138501041

Methodology

The study draws on data from approximately 650 students in their GCSE year across five schools across England. Using an RCT methodological approach, the schools divided the young people across tutor groups into an intervention group and a control group. This study has taken a pilot approach which is one which explores the implementation approach, experimental design and analytical options, while identifying key statistical parameters and hypothesis to inform the design of a larger trial. The approach can then be adjusted in larger trials such that we are confident the process is adequate to answer the trial questions.

The intervention group consisted of 307 pupils who received three extra career talks by volunteers from the world of work on top of the usual career activities organised by their school. In the trial, learners were randomly allocated to the two groups, details of their anticipated GCSE results were collected, and then comparisons were made between their predicted grades and how well pupils did in their actual exams.

Data was collected from Year 11 students throughout the academic year 2017-2018, with a baseline survey at the beginning of Year 11 and another at the end of the year. GCSE results were collected in September 2018 for everyone who participated in the study. Students who participated in the three career talks also filled in a survey afterward to give their feedback on the talks and comment on what, if any, help the talks had been for their choices and attitudes.

Career talks were from local volunteers from the world of work who were prompted to highlight connections between educational achievement and employment opportunities.

Our pilot RCT revealed one key issue which needs to be solved in a future trial and that is the reduced response rate to the post-GCSE survey, among non-returning students post-GCSEs. However, the final analysis is drawn upon the exam results for everyone in the sample.

Headline findings of the research

This research revealed that positive changes in young people's attitudes and motivation levels contributed and pointed towards improvements in attainment.

A) Changes in student attitudes

- Students who took part in the three extra career talks showed improvements relative to the control group with respect to their:
  - Self-efficacy (confidence in their own abilities)
  - Attitudes about the usefulness of school
  - Confidence in fulfilling their career aspirations
- As the result of the three encounters young people had, 7% of the students changed their future plans while around 20-28% of them questioned their career and education choices.

B) Changes in the number of weekly revision hours

- Planned weekly revision hours in the lead up to exams is used as a proxy for how seriously students are taking the process and their "motivation to study harder"
- The analysis shows there is a positive and statistically significant relationship between taking part in three extra career talks and motivation to study harder. Students in the intervention group reported, on average, a 9% higher increase in their weekly revision hours than peers in the control group, linked indirectly to GCSE attainment via a separate analysis showing the importance of revision hours for GCSE attainment.

C) GCSE results

- At the beginning of the study, the GCSE predictions for all young people in the study were collected and compared with their actual grades, so that we could measure students' outperformance.
- The analysis reveals an indicative, direct link between the career talks and students' outperforming their predicted grades, the equivalent of one student in a class of 25 beating their predictions by one grade as a result of the career talks (controlling for gender and free school meals).
- There appears to be differences between the three subjects – the effect on English was more than double the average effect.
- While the effects are modest and need further exploration as part of a larger trial, this is an important finding, especially given the small costs involved in putting on three career talks.

D) Who benefits the most?

- The sub-sample analysis shows that **lower achievers and less engaged learners** responded best to the intervention.
- Within the intervention group who received three extra career talks, those who were initially **more sceptical of the value of the education** reported a greater increase in motivation to study harder. For instance, students predicted a borderline pass in English GCSE reported a 32% increase in planned weekly revision hours after the test, whereas those predicted high grades from 6 to 9 only reported a 10% increase.
- **More is more!** The impact of the extra career talks was larger for young people who **had previously attended more short-duration career activities** (such as career talks or careers fairs). Such students were more likely to outperform their predicted grades and reported a higher level of motivation to study harder, the equivalent of an extra 20% in planned hours if they had done four such short-duration activities before the three organised for the study.

1. Introduction

This report explores the hypothesis that engaging with the world of work through school-mediated employer engagement activities can enhance academic attainment by influencing and enhancing young people's positive attitudes towards education, career choices and themselves. Such engagement can potentially influence attainment over different time frames. Our trial specifically tested the potential to impact attainment over the short-term, looking at how extra career engagement in the months leading up to exams could impact the motivation to revise. The results also shed light on longer-term channels for impact, such as more positive attitudes towards education and shaping education pathway choices. This introduction summarises what the study did, why the topic is important, and why there might be an impact on attainment. It also highlights the key findings and sets out the structure of the report.

What is a randomised control trial?

A randomised control trial is a study in which a number of similar people are randomly assigned to two (or more) groups to test a specific intervention. One group ("intervention group") has the intervention being tested, the other ("control group") has no intervention at all.

The groups are followed up and tracked via surveys to see how effective the intervention was. Outcomes are measured at specific times and any difference in response between the groups is assessed statistically. Randomised control trials are seen as especially valuable by researchers as they address a common caveat with studies for education interventions: people who are selected or volunteer to take part in an intervention can be different from the general population, for instance they may be particularly motivated to make improvements.

What the study did - A pilot approach

A randomised controlled trial (RCT) was set up, generating valid data on 647 Year 11 students (aged 15-16) in five English schools. This study has taken a pilot approach to RCT. A pilot explores the implementation approach, experimental design and analytical options, while identifying key statistical parameters and hypothesis to inform the design of a larger trial. The approach can then be adjusted in larger trials such that we are confident the process is adequate to answer the trial questions.

During the trial, students were randomly divided into two groups, with around half the students falling into an "intervention group" which took part in three short career talks with volunteers in employment ("employer career talks") between January and March 2018 before their GCSE examinations later that year. The study explores the potential impact of participation in the talks by asking participating students for their feedback and by analysing the results of start-of-year and end-of-year questionnaires completed by students in both the intervention and the control group, and by comparing final GCSE scores with their predictions to get a measure of prediction "outperformance".

Why the study is important

This is the first time in England, an RCT has been used, and published publicly, to explore the impact of such career talks on academic attainment. The use of robust methodologies is particularly important in this context because some policymakers and schools remain less sure about the possible impact of employer engagement on academic attainment than on other life outcomes. Since school accountability is driven more by education outcomes than economic outcomes, this lack of consensus may result in less investment in employer engagement and broader career-related learning than would be in the students' best interests. Some schools – under pressure to improve academic outcomes – may worry about any time out of formal classroom learning, particularly in an exam year.

Employer engagement in schools is now widely understood as a potential means for enabling better economic outcomes for young people, especially when faced with the complex and opaque labour markets of today (Mann and Huddleston, 2015). This reflects both a growing empirical evidence base underpinned by theoretical mechanisms (Mann et al, 2018) and the relative simplicity of the proposition: the almost tautological assertion that spending more time with employers in more diverse ways has the potential to help you engage more productively with employers in the future. Uncertainties and alternative views remain about how large the impact might be, about who might benefit the most and about what type of employer engagement is most effective at different stages, but the underlying principle is rational and well-established. For instance, this principle has been recommended by the OECD (Musset and Kurekova, 2018) and has become government policy in England – schools are now required to ensure that all young people engage with employers every year of their secondary education (DfE, 2017).

There is, however, less consensus on whether employer engagement can have a positive impact on academic attainment. Major international literature reviews commissioned by the Education Endowment Foundation in the past few years have identified mixed effects – some modest positive findings alongside some neutral findings (Mann et al. 2018, Hughes et al., 2016). Teacher surveys have suggested they would expect to see benefits for attainment, particularly for subgroups of pupils that are less engaged or close to key grade boundaries, but this is based on experience and intuition rather than quantitative evidence (Kashefpakdel and Rehill, 2017).

Why we think there might be a positive impact on attainment

There are good theoretical reasons to believe teachers' intuition about employer engagement: such activity affords young people the opportunity to hear new and useful information about the world of work from new and authentic sources, with the potential to drive engagement and motivation at school. This information can clarify the importance of education to future success, as well as provide role models – proof that it can be done. It can also help students make subject choices that fit into a future career vision, subjects that thus feel more relevant and worthwhile. But theory is not necessarily enough, especially when competing for a timetable slot with activities like booster classes and one-on-one tutoring.

Analysis of the existing empirical literature, including cross-country analyses of PISA test data, suggests that career-related learning and employer engagement activities can support attainment (Kashefpakdel et al, 2018; Kashefpakdel and Schleicher, 2017) and there are modest correlations between school-level GCSE results and the Quality in Careers Standard (Hooley et al, 2014). Specifically, the PISA analysis showed that activities like careers advisor support, job fairs and job shadowing were frequently associated with improvements in student motivation; importantly, modest correlations were also identified on test score performance. The PISA study covered six countries (Australia, Belgium, Canada, Denmark, Finland and Ireland), but the UK did not participate in the necessary questions.

At the heart of the issue is the shortage of hard evidence on national exam results at the sample sizes necessary to spot the impact of employer engagement. This impact is likely to be modest, at least at the scale that employer engagement is typically structured today: not just because such activities are less directly aimed at passing exams than other school activities, but also because the employer activities themselves are modest in scale. For instance, there may be multiple employer engagement activities during school, perhaps short talks, discussions in classes, work experience sessions, enterprise competitions and so on, but these are unlikely to account for more than 1%-2% of secondary school hours (The Careers and Enterprise Company, 2018). In general, modest interventions can be expected to have modest effects, which makes them increasingly hard to disentangle from other in-school or out-of-school experiences or interventions. Larger sample sizes and more controlled experimental or quasi-experimental analyses are required to tackle such complex phenomena as academic attainment and education pathways. Nonetheless, even evidence of small effects could represent a compelling argument – schools fight hard for every grade and small effects can still be a great return on investment, particularly for very low-cost activities like career talks.[3]

What the study found

This study allows us to investigate the short-term impact on academic attainment of employer career talks both through the indirect channel of revision hours and via a direct analysis of exam results. The

[33] Career talks organised via the *Inspiring the Future* platform are free to schools, requiring only the investment in staff time to contact volunteers, support the students and manage the session.

indirect channel relies on a two-stage logic, showing a 9% increase in weekly revision hours and a statistically significant association between planned revision hours and GCSE attainment in English, Maths, and Science. The effect appears to be stronger for lower attaining students and those who are initially critical of the value of their education; it is also stronger when students are prepared for their talks by their school.

Within the limits of the sample size, we additionally identify an indicative, direct link between the career talks and students' out-performing their predicted grades, the equivalent of one student in a class of 25 beating their predictions by one grade as a result of the career talks (controlling for gender and free school meals). There appear to be differences between the three subjects – the effect on English was more than double the average effect.

As anticipated, given the sample size and the power calculations undertaken prior to the trial commencing, this modest average effect across all students and schools is not statistically significant. Nonetheless, within two groups where employer career talks were hypothesised to have greater impact, the findings are larger and statistically significant: within a particular school where the talks were high quality (~0.6 of grade effect per student) and for the subgroup of students who had done lots of comparable employer engagement previously (~0.4 of a grade effect per student in English). In no subgroups or schools are there equivalent statistically significant negative effects. We recommend using the methodology and statistical parameters derived from this pilot RCT to design a larger trial to conclusively test such average and subsample effects.

The potential for medium- and long-term impacts on attainment are also reinforced by this study. For instance, the intervention group results describe an 11 percentage point improvement over the school year in the proportion of students who "always try their hardest at school" compared to only a 1 percentage point improvement in the control group. Importantly 20-28% of students said the talks had made them question their career and education pathway choices, with 7% saying they had changed their future plans as a result of the talks.

The implications for schools and policymakers

The study contributes to a growing literature that will enable schools to take a more strategic approach to harnessing the power of employer engagement to enhance outcomes for young people.

Many teachers have told us they wish to do more employer engagement in schools; however, we recognise that for this to happen, difficult decisions need to be made. For many, exam results represent the single most direct, transparent and objective measure of learning in school. With that in mind, our evidence suggests that using timetable time for career engagement activities, even during an exam year, is far more likely to be beneficial to attainment than detrimental. Young people can continue to gain value for their future planning and their entries into the labour market – the main objective of career talks – while still anticipating modest ancillary benefits with respect to study motivation, revision hours and attainment. Crucially, it is possible to see benefits via a low-cost, easily-delivered package of three employer career talks, taking approximately three hours out of the school year. These findings should strengthen the case for career-related learning and employer engagement.

Furthermore, for policymakers, this study should reinforce the direction of travel adopted by England and the OECD, strengthening the role of career-related learning and employer engagement in schools. A clear way forward can also be specified for those wishing to strengthen the evidence base and to better understand the subjects and subgroups on which employer career talks can have an impact. This RCT can be scaled in a straightforward fashion; for instance, using the Inspiring the Future platform to reach 4000 to 9000 students (statistical parameters derived from this pilot analysis have shown these numbers would be sufficient to conclusively differentiate key hypotheses of interest).

How this report is structured

This report begins by setting out the research context, elaborating on the themes in this introduction: Under what theory of change might career-related learning and employer engagement in schools support academic attainment? What direct evidence exists that this can improve academic attainment? What types of student are anticipated to benefit the most from careers activity?

Section Two sets out the methodology for the RCT, explaining the generation of data on 647 students across five schools in England. This section addresses the rationale and planning of the experiment, the approach to randomisation, and the choice of analytical instruments. It also presents descriptive data on the school and student characteristics and presents the initial power calculation that estimated the plausible range of GCSE attainment effect sizes that this initial study might be able to identify.

Section Three presents the findings and grouping analysis across the different available data sources to focus on different topics of interest: How did students rate the quality of the career talks? What was the

impact on career and education choices, on student attitudes, on planned weekly revision hours and on academic attainment? How do these effects vary by student background and attitude? Finally, we investigate the possibility that adding extra career talks "on top of" existing career provision might result in lower impact per activity and we set out the insights for future RCT design, including the sample sizes that would be necessary to address questions around GCSE attainment more conclusively.

A further discussion of the findings and suggestions for further research, including avenues for a larger trial, can be found in Section Four. The Annexes to this report provide the three surveys used during the study and analyse the differences in sample features between the final survey respondents with those participating earlier in the year.

2. Research Context

Existing research provides important insights into several questions that motivated and shaped our study. This section draws on that research base to first explore the theory of change under which career-related learning and employer engagement can enhance academic attainment, supported by survey testimony from students and school staff that such activities can be beneficial.

Given that high-quality empirical studies are sparse, we then summarise analysis on different types of activity, all of which incorporate employer engagement to different extents. The first is work-related learning as a qualification, which often incorporates much more employer engagement than traditional academic learning. The second is overall career programmes within schools, typically forming part of pastoral provision rather than formal qualifications. Such programmes generally include employer engagement alongside support from professional advisors and other activities with school staff. The third area captures the few studies that specifically focus on employer engagement. Finally, we present analysis from the literature that suggests hypotheses for which groups might benefit most and we discuss the potential for extra career talks to add value, on top of the school's pre-existing career programme.

Systematic literature reviews funded by the Education Endowment Foundation suggest that the overall evidence base, while thin, points to either positive or neutral impacts on attainment, with very few studies finding a negative impact. Two such reviews explored activities undertaken across the OECD countries which had been evaluated using experimental or quasi-experimental methodologies and published since 1996 (Hughes et al., 2016; Mann et al., 2018). 60% of 47 studies which considered the impact of career-focused interventions on academic achievement found evidence of largely positive outcomes (other studies focusing on social and employment outcomes were also included in the full study), see Table 2.

Table 2: Educational outcome assessment by intervention likely to involve employer engagement (Hughes et al., 2016)

Intervention area	Number of studies	Generally positive outcomes	Mixed results	Generally negative results
Enterprise activities	3	-		-
Job shadowing	3	1 (33%)	2 (67%)	-
Mentoring	13	8 (63%)	5 (38%)	-
Work experience	4	4 (100%)	-	-
Work-related learning	24	14 (58%)	9 (38%)	1 (4%)
Total	47	27 (58%)	19 (40%)	1 (4%)

Collectively, the research base supports the principle that there can be academic benefits from activities like employer career talks, but that such benefits may be modest and may vary from group to group and, as such, are unlikely to be easily identifiable in empirical work. Research also provides indications about a good practice approach to employer career talks and highlights possible subsample analyses that we might explore through the data we collect.

Theory of change for academic attainment

What young people learn, what they aspire to do, what they choose to do and how they behave and achieve can be influenced by the social groups that they belong to, their current social relationships, the character and quality of their educational experiences and their individual personalities, experiences and circumstances (Stanley and Mann, 2014).

The impacts explored in this study are anchored in a theory of change for career-related learning and are lent greater weight by literature arguing that employer engagement activities have particular potential within them. By focusing on attitudinal change as the key

mediating channel by which the career talks in our intervention might initiate improved academic outcomes, indirect empirical support can be identified in the literature that shows, on one side, links between employer engagement and attitudinal change, and on the other side, links between student attitudes and academic outcomes.

In their 2014 study, Hooley et al. draw on the work of Killeen et al. (1999) who argued that career-related learning helped improve academic outcomes because of its capacity to:

- understand the relationship between educational goals and access to occupational goals;
- clarify valued outcomes;
- set attainable educational goals; and
- understand the relationship between current educational effort and performance to the achievement of educational and career goals. (Hooley et al., 2014: 20)

Career-related learning can therefore help people to set achievable goals and identify the practical steps that can be taken towards these goals, while enhancing motivation, academic engagement and attainment. For instance, Borghans and Golsteyn (2006), using the DNB Household Survey (a large Dutch longitudinal survey), find evidence that students who are better able to imagine the future: study more hours per week; have a lower probability of dropping out; and progress to work sooner, rather than staying in school simply to postpone the transition to work. On the other hand, a lack of information about the future prospects of a chosen field of study may not only make informed decisions about one's education pathway more difficult, it may reduce the incentive to put effort into studying.

Within career-related learning, researchers have identified particular potential for employer engagement activities, drawing upon the influential work of Granovetter (1973), who conceptualises the 'strength of weak ties' in evidencing the ways in which the character of social networks can be seen to influence labour market opportunities. Raffo (2000) and, later, Stanley and Mann (2014), use social and cultural capital theory to illustrate how employer engagement activities can influence students' attitudes towards schooling by exposing them to new information about the relationship between educational and economic outcomes. Interactions with employers, it is argued, extend (even if only temporarily) young people's social networks, thereby helping them bridge the gap between the adolescent world and the adult world (Stanley and Mann, 2014). Information available to students from a range of external speakers can be expected to be more authentic if it is rooted – and seen to be rooted – in a broad range of experiences, which might increase the likelihood of potential student interest.

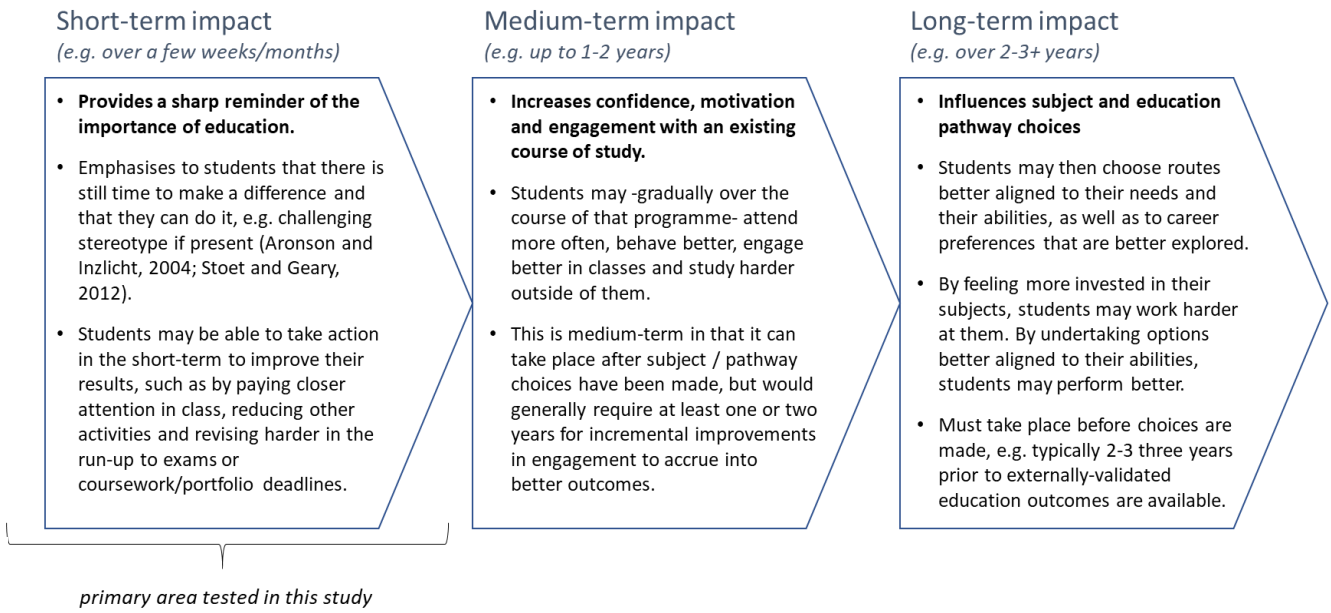
> *Even if the underlying messages and content are similar between an employer-led and a teacher-led session on a particular career or the nature of working life, the volunteer from the world of work may be able to convey greater authenticity, ultimately enabling more messages to stick and drive impactful attitudinal or behavioural change.* (Percy and Kashefpakdel, 2018: 204)

Encounters with new people can lead a young person to change an important element of their own thinking about themselves and their own sense of agency – it would not be expected to happen for every young person from every encounter and changes may vary from reinforcing existing beliefs to challenging epiphanies. Such indirect and individually non-linear impacts are harder to isolate statistically but are not necessarily diminished for it.

Different time horizons for impact on attainment

The influence of career-related learning activities, as summarised by Hooley and et al. (2014), can be thought of as shaping academic outcomes over three different time horizons in the context of secondary education, as set out in the diagram below. Our trial, consisting of three career talks delivered by volunteers from the world of work ("employer career talks") between January and March of Year 11, is only able to directly test the potential scale of the short-term horizon effect, i.e. whether students who do the talks have more positive views on education, enhanced plans to revise, and better GCSE results relative to the predictions than a comparable peer group.

The study can also point towards the potential for the medium-term horizon effect, in that the attitudes are measured near the start of the academic year and at its end. However, the possibility that such improvements in attitude might translate into academic gains during the course of study, rather than in the last few months dedicated to final points, recap and revision, could only be tested directly by a longer duration study. The longer-term horizon effects can also be indirectly explored by asking students who participated in the talks whether it influenced their education and career preferences; but the potential academic impact of new choices cannot be directly tested, nor can we confirm whether the new choices turned out to be sensible, although having been based on more information they are likely to be, on average and with exceptions, more sensible than they were beforehand.



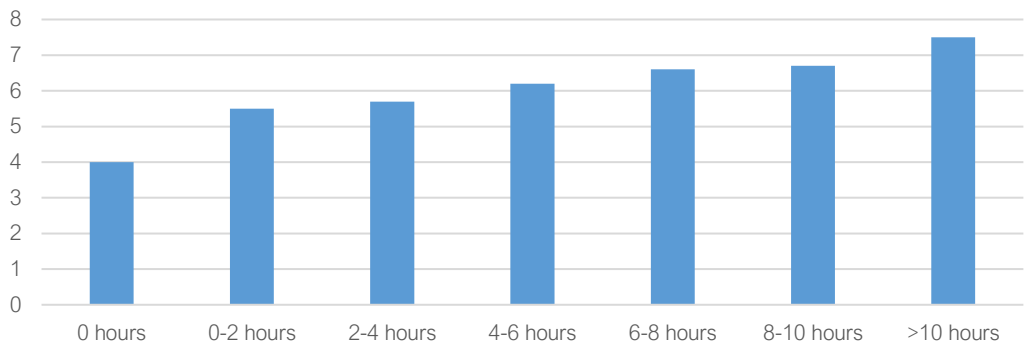
Importance of weekly revision hours to attainment

Given the focus of this study, it is also helpful to clarify empirically that increased revision activity can indeed support attainment.

In her 2007 paper, Osborne examines the impact of an online revision tool on GCSE results. The paper reports the findings of a quantitative investigation into the impact of the use of e-learning for revision on GCSE results in four local authorities (LAs). Data was collected on more than 11,500 students attending 58 secondary schools in four LAs. In all four LAs, pupils who used the online tool to revise achieved more or higher-graded GCSEs than pupils who did not. Pupils spending up to two hours using the service achieved, on average, 1.7 more GCSEs graded A*-C than those who did not use the service at all. The longer a pupil used the revision tool, the more GCSEs graded A*-C were achieved (Figure 1).

Pocklington (1996) evaluated a two-year school improvement project involving eight secondary schools in Hammersmith and Fulham. The schools developed a range of study support activities, such as revision classes, coursework clinics and homework centres. Teachers said that the students who took part in study support showed improved motivation, self-esteem and behaviour. Interestingly, there was evidence that the scheme had changed the attitudes of participating teachers, who became more motivated and more willing to consider further school improvement initiatives. An analysis of the GCSE results obtained by Year 11 students showed that those who had attended the Easter revision centres achieved higher grades than students who did not attend. Checks on the reading attainment of pupils on entry from primary to secondary school had indicated no difference between the two groups in their initial attainment.

Figure 1: Number of A*-C grades achieved at GCSE by pupils in Year 11 in 2006, by task hours (Osborne, 2007: 12)



An evaluation of a study support initiative in Tower Hamlets (Tower Hamlets Study Support Project, 1997) produced similarly positive findings. Schools that participated in the initiative experienced larger gains in GCSE results over a three-year period than did non-participating schools (although it is not clear whether the two groups of schools were equivalent). At the student level, a positive association was found between GCSE performance (relative to teachers' predictions) and attendance at Easter revision classes.

Survey testimony from students and school staff

Survey data collected by Rehill et al. (2017) from young people attending careers events indicate that engagement in the events is associated with more positive attitudes. When asked, the majority of young people agreed that they were motivated to study harder as a result of attending careers events. Two relevant surveys of teenagers find similar results (CBI, 2007; National Support Group, 2008) with majorities of pupils aged 14–16 agreeing that they better understood the value of education for employment after work experience or testifying that they worked harder on schoolwork after placements.

Recent surveys of teachers and school staff support the belief that any positive impact on attainment largely stems from attitudinal change – that is, an enhanced regard for the value of education and qualifications. These surveys routinely show majorities of large cohorts of teachers agreeing that pupils taking part in employer engagement and career development activities return more mature, focussed and with greater confidence (Hillage et al., 2001: 110; Eddy Adams, 2008: 37; Mann et al, 2012: 20-21; Kashefpakdel and Rehill, 2017).

One survey with 390 secondary school teachers explicitly sought professional views on the comparative value of different interventions to enhance academic achievement (Mann et al., 2017). Respondents were asked to select, from a list of 16 work-related activities (including many relating to employer engagement in education), those that took place in their own school. They were then presented with a new list of activities, of which they had knowledge, and asked to select which, if any, in their view, were effective in achieving a range of educational and employment outcomes. Table 1 summarises the responses for one particular outcome: improving student attainment.

Table 1: Proportions of secondary school teachers with experience of pupil participation in employer engagement activities perceiving the activity to be effective in improving student attainment (Mann et al., 2017: 27)

Activity	Number with experience of activity	Number believing activity to be effective	Percentage believing activity to be effective
Work Experience	353	203	58%
Short-form enterprise competition	313	120	38%
Long-form enterprise competition	231	82	35%
Mock interviews	288	97	34%
Career talks	350	117	33%
Workplace visits	237	76	32%
Mentoring	115	36	31%
Work-related learning qualifications	183	45	25%

Empirical evidence of impact on attitudes

A growing number of studies show that career-related learning and employer engagement are effective in changing student attitudes. One powerful example from the United States (US) draws on a school-based randomised trial of a CareerStart intervention that was introduced in seven of 14 participating middle schools in North Carolina. Drawing on three years of data for some 3,500 students (Orthner et al., 2010). CareerStart helps teachers in core middle school courses (i.e., mathematics, science, language arts and social studies) illustrate the value of learning compulsory subject content by incorporating career examples drawn from industries represented in the labour markets in which the schools reside. The study found that students in the CareerStart treatment schools were 41% more likely to report above-average levels of valuing school as compared with students in control schools (odds ratio = 1.41).

Student attitudes have, in turn, been shown to be very influential on outcomes. For instance, in England, Golden et al. (2005), using a database of information surrounding the attitudes, behaviour and achievements of 1,800 pupils, found evidence that students' attitudes and behaviour could influence their outcomes at KS4. For instance, they report that students who had a positive attitude towards school

and its usefulness for the future as indicated in Year 11, attained more points in total at KS4 than students who were similar in terms of their prior attainment and other background characteristics, but who had a negative attitude. Similarly, Mourshed et al. (2018) investigated OECD's PISA dataset, building on earlier work by Lee (2014). They find that students' 'mindsets' (interest, motivation, engagement with studies) influence academic performance more than a number of background factors, including socio-economic background and school type.

Analysis of employer engagement via work-related learning qualifications

Plank (2001) exploits data on US high schools from the National Education Longitudinal Study of 1988 to explore how the changing balance between academic course-taking and career and technical education activity can be related to academic achievement and persistence in high schools. The study argues that it is helpful for such courses to co-exist. It points to modest evidence of improved test scores as well as significant gains on reduced school drop-out, where, for this sample, a ratio of approximately three CTE credits to every four academic credits was associated with the lowest likelihood of dropping out.

In the UK, Harrison et al. (2012) examined whether participation and completion of the Certificate of Personal Effectiveness (CoPE) had an impact on GCSE attainment, using data on over 500,000 students. CoPE is a national qualification that involves modules on vocational preparation as well as work-related learning and enterprise. Undertaking CoPE at Level 2 in a 'wide usage' school, i.e. undertaken by 25-100% of the students, is associated with an estimated 10% increased likelihood of achieving GCSE English at A* to C, compared to similar young people in schools not offering CoPE. CoPE also appeared to have a stronger impact among those young people with low KS3 attainment. 21.5% of the low KS3 attainment group taking CoPE achieved GCSE English at A*-C compared to 13.0% in non-CoPE schools.

While not the main focus of this paper, it is worth highlighting that other research has also demonstrated positive academic outcomes when students have meaningful interactions with the world of work in higher education, usually through sandwich courses and work placements (Person and Rosenbaum, 2006; Blicblau et al., 2016; Ceschin et al., 2017).

The Department for Education in England (and its earlier iterations) have made various efforts to improve students' standards of achievement during secondary education through work-related learning initiatives, often involving employers (QCA, 2004; DCSF, 2009). Programmes and qualifications such as the Increased Flexibility Programme at KS4 (Ofsted, 2004) and the 14-19 Diploma (DfES, 2005) were subjected to independent evaluations, which included discussing the educational success of teenage participants (Golden et al., 2006; O'Donnell et al., 2006; Golden et al., 2010; Lynch et al., 2010). However, it is often harder to draw quantitative links from such evaluations about the impact on academic achievement, as the programmes of study lacked a straightforward counterfactual for what students might have achieved on other programmes.

Analysis on Young Apprenticeships (YA) learners by Golden (2010) is worth highlighting here: The programme aimed to provide KS4 pupils with the opportunity to acquire knowledge and skills in a specific vocational area with a view to gaining a Level Two qualification. It involved pupils spending at least two days per week in a different learning environment and aimed to give support and guidance to enable them to pursue further education, especially apprenticeships. The analysis drew on the Department for Education's National Pupil Database to show that 78% of pupils achieved the equivalent of 5 or more A*-C grades at GCSE, compared to 63% of non-YA pupils in the same schools and 64% nationally, although it is hard to rule out the possible impact of other differences between the cohorts.

Analysis of employer engagement as part of broad career programmes

More quantitative evidence for potential impact during the secondary education phase can be identified from evaluations of integrated career programmes outside of core curriculum content.

Hooley et al. (2014) analysed the performance of 820 schools in the UK that had successfully validated the quality of their careers provision with an external party leading to a quality award, the Quality in Careers Standard (QiCS). Compared to a statistical sample of matched schools, possession of QiCS was associated with a statistically significant 1.8% increase in the number of students attaining at least five good GCSEs and a 1.8% increase in the number of students achieving maths and English GCSEs. QiCS – as specified in the 2012 guide – covers a wide range of aspects of careers provision, with two items referring to engagement with employers. Section 1.5 required schools to involve "… others in effective partnerships to support young people's career aspirations and decisions – partnerships should draw on external providers of careers information, advice and guidance services, local authorities, further and higher education, work-based learning providers, employers and other agencies". Section 1.7 required drawing on

external partners, including employers, as part of reviewing its career programme.

Drawing on a large-sample of over 20,000 students in Missouri, Lapan, Gysbers and Petroski (2001) found that students who attended schools that had implemented the Missouri Comprehensive Guidance Program (MCGP) were more likely to report positive academic outcomes. The MCGP contains three elements, one of which involves three guidance curriculum content areas: career planning and exploration, knowledge of self and others, and educational and vocational development. Counsellors were required to involve local business and employers in the career guidance as part of the programme. Students who attended schools with more fully implemented school counselling programs reported higher grades, greater satisfaction with the education they were receiving in schools, and greater confidence that their education was relevant for their futures; these effects were statistically significant and controlled for between-school differences in socioeconomic status and enrolment size.

Analysis of employer engagement activities as studied directly

It is unclear to what extent employer engagement activities contribute to the positive impacts identified in the integrated career programme evaluations described above. More targeted evaluations provide more direct evidence that the employer contribution is itself valuable for academic attainment.

Kashefpakdel et al. (2018) drew on cross-country comparative data from the OECD's 2012 PISA tests to contrast participation in specific careers activities with academic attainment on the PISA tests. As the authors explain, every three years dozens of countries and regions from around the world work with the OECD to randomly select students, aged 15, to take part in tests that measure capability in reading, mathematics, science, problem-solving and financial literacy. Questions also include explorations of students' social background and family life and participating schools return data on the broader school system and learning environment, allowing for a rich array of control variables to be used in the analysis. In the 2012 year, 22 of 65 participating countries and regions also asked optional questions about participation in career development activities. The UK did not answer those questions, but six countries – Australia, Belgium, Canada, Denmark, Finland and Ireland – were analysed by Kashefpakdel et al., which allows some triangulation around a UK context. Across the different countries and career development activities, statistically significant associations were often, but not always, found for more positive attitudes towards the utility of schools in preparing teenagers for adulthood. Speaking with a careers advisor within school was consistently associated with more positive responses, followed by participation in a job fair, taking part in job shadowing and then internships. The link to attainment was much more moderate, but still suggestive. Participation in the activities provided some support to higher PISA maths scores, with a similar pattern with respect to types of career development activities. The positive effect was typically 2 to 17 points on the PISA maths test, where – for context – 19 points mark the difference in country-level average performance across the six countries studied.

Research has also focussed on the impact of more intensive employer engagement activities such as mentoring on academic achievement. Such mentoring typically, but not always, involves adults who are in work or have experience of the working world, albeit acknowledging variation in the extent to which individual mentors draw on their knowledge of work in their mentoring.

Miller (1998) examines a mentoring programme designed to support Year 11 pupils identified as being on the borderline of achieving 5 GCSEs A*–C. In the study, 176 students (split between mentored and control groups) took the Year Eleven Learning Information System (YELLIS) test devised by the University of Durham. GCSE results were matched against the YELLIS predictions using the standard scoring system (i.e. A* = 8 points to G = 1 point). 46 mentored girls scored an average 2.26 GCSE points above YELLIS prediction compared to 1.87 GCSE points for the 43 control group girls. The difference between these scores gives a measure of the value added by mentoring of 0.39. The 44 mentored boys had an average score of –1.72 GCSE points below YELLIS compared to –2.13 for the 49 control group boys (mentoring value added = 0.41) – an identifiable but modest impact overall.

In a similar but more recent study, Sharpe et al. designed a randomised control trial (RCT) involving 86 Year 11 students to test whether mentoring changes students' attitudes towards science and higher education, measuring GCSE results and attitudinal changes as a result of the intervention. The study found that mentored students did statistically better in terms of attainment in both mock and actual GCSE examinations and also showed a statistically greater improvement in their attitudes to science than un-mentored children (Sharpe et al., 2018).

The literature on employer engagement activities also provides some insight into the circumstances under which they are more effective. In particular, Rehill et al. (2017) note that students can be expected to gain more value from external talks with outside speakers when they have had the opportunity to prepare in

advance, perhaps reflecting on questions that the speaker may be able to address. Teachers and other school staff can also help debrief what they think they have learned from the talk.

More broadly, employer engagement activities are thought to be more effective when undertaken within the context of integrated, holistic and effective careers provision (The Careers and Enterprise Company, What Works series 2016-18[4]; Musset and Kurekova, 2018). This notion has been tested recently by Percy and Kashefpakdel (2018), who explored the importance of the school environment in determining the potential impact of outside speakers. Drawing on data from the large-scale British Cohort Study, the authors find that students in a richer internal career-related environment (measured by the volume of careers classes, chats, and meetings) were more likely to say external speakers were quite or very helpful. As Kashefpakdel and Percy (2017) demonstrated in an earlier study drawing on the same dataset, students completing the survey at age 16 who described activities as 'very helpful' saw an average wage premium 0.7 percentage points higher than those who described them as unhelpful.

Hypotheses on groups that might benefit the most

So, to optimise the impact of careers activities – with respect to students being well-prepared for and debriefed after employer engagement activities, and to schools providing a rich overall career programme – context does indeed matter. This finding can then be extended to considering what types of students might benefit most and highlighting possible sub-sample analysis that may be insightful for understanding the impact of our intervention. While large-scale quantitative studies remain relatively rare in this area, surveys of teachers provide some initial hypotheses.

Education and Employers published the findings from a survey of 824 secondary school teachers that explored what happens to children's and young people's academic achievement after taking part in activities with volunteers from the world of work; for example, work experience, career sessions or enterprise activities. Teachers strongly agreed that employer engagement activities could, in principle, positively impact students at all levels of achievement, but noted that interventions were often found to be most effective for borderline and lower achievers (Kashefpakdel and Rehill, 2017). Mann and Dawkins (2014) highlight this perspective in a qualitative focus group exploration of the issues with teaching staff. In discussions, participants noted that the greatest impact could be expected among middle- and lower-level achievers. This is because high achievers are usually highly motivated already and motivation is a key channel through which employer activities impact attainment (Mann and Dawkins, 2014). On average, teachers believed one in five students in a typical year group could experience positive impacts on their academic achievement after taking part in employer engagement activities (Kashefpakdel and Rehill, 2017).

High-achieving, highly-motivated pupils who see the value of qualifications and education to their long-term success, immediate sense of self-worth and to their well-being are still likely to benefit from employer engagement activities, but in different ways from their peers and less in terms of enhanced attainment. One of the ways high achievers may expect to secure benefits from employer engagement is securing admission to undergraduate programmes of study at more selective higher education institutions (HEIs). Many HEIs call for relevant work experience within admissions requirements (Mann et al., 2011; Rehill, 2016) and it is a well-established practice within independent schools to use employer engagement activities to enhance prospects of university admission (Huddleston et al., 2014).

Quantitative analyses reinforce the idea that motivation is a key channel. Kemple and Willner (2008) explored the impact of work-related learning programmes in the United States Career Academies, school-based programmes that seek to reduce dropout rates and improve school performance and career readiness among high-school youth. A Career Academy is organised as a school-within-a-school, where students work in "small learning communities". In an effort to build connections between school and work and to provide students with a range of career development and work-based learning opportunities, partnerships are established and operationalised with local employers. A large-scale, multi-site, random assignment research design was conducted to determine the impact of Career Academies on student outcomes. The study found that for students with lower engagement and high drop-out risk, the Academies increased the likelihood of staying in school until 12th grade (age 17-18), improved attendance, and increased the number of credits earned. It is noteworthy that there was no significant impact on academic attainment or drop-out rates across the whole sample, only within those who were initially disengaged. This is a sharp contrast to the strong impact on wages (around 11%, sustained over the eight years of follow-up), suggesting that such career programmes can have a significant impact on labour

[4] Available at: https://www.careersandenterprise.co.uk/blog-category/what-works [Accessed 1 Feb 2019]

market outcomes through channels outside of academic attainment, in addition to any labour market impact that a programme might drive via attainment.

The hypothesis from teacher surveys that lower attainers might benefit more is lent quantitative support from further analyses on the British Cohort Study. Students from more disadvantaged backgrounds who, on average, are statistically correlated to lower attainment, were more likely to describe school-organised career talks with external speakers as very helpful (Percy and Kashefpakdel, 2019). Positive experiences with school-organised activities, especially those that tend to make links between the value of education and future prospects, are likely to support motivation and engagement with education. Collectively, this suggests that lower attainers and those from disadvantaged backgrounds may see greater average benefit from this programme of career talks than other students.

The potential for extra employer career talks to add value

This intervention consists of additional career talks, on top of the schools' pre-existing careers programmes; as such, it is worth considering whether such extra activity may still be able to add value. In other words, at the levels of career activity that might typically take place in England, is it likely that adding extra volume of activities will add value or will some law of diminishing returns kick in?

Existing research suggests that volume matters, at least in terms of the levels of activity likely to be involved. In other words, more is more: More activities should still add value.

Focussing on economic rather than educational outcomes, Mann and Kashefpakdel note that young adults aged 19-24 who recalled attending three or more school-mediated career interventions (e.g. career talks, careers fairs) felt the events were significantly more helpful to them in life than peers who attended just one or two events (Mann and Kashefpakdel, 2014). The longitudinal data in the British Cohort Study, as previously referred to, also shows that extra career talks with outside speakers are correlated with better labour market outcomes at age 26 (as measured by earnings for those in full-time employment). With controls for background characteristics and academic success in place, each career talk with outside speakers at age 14–15 in the mid-1980s was associated with a 0.8% wage uplift in 1996, with benefits continuing broadly linearly up to the top end of the scale with 30-40 career talks per year (Kashefpakdel and Percy, 2017). It is worth highlighting that this same analysis found smaller economic effects for career talks at age 15-16, the equivalent of Year 11 in the current study, with positive effects only identified from career talks in that year among students who described them as very helpful. This suggests that career talks may have more benefit over a longer time frame than the one covered in this study.

Survey data gathered from careers events reiterates this notion that the number of volunteers encountered has a continuing beneficial effect. Rehill et al. surveyed some 260 students attending careers events in Years 11-13. Young people who had interacted with six or more volunteers reported more positive responses across a number of areas. Those who saw six or more volunteers were 15% more likely to say they had learnt something new and useful, 13% more likely to say the event made them think of different routes to employment and 14% more likely to say they were motivated to study harder than peers who encountered fewer volunteers (Rehill et al., 2017).

Summary

Existing literature, based on both robust methodologies and impressionistic data, suggests that enhanced academic achievement is a legitimate aim and outcome when providing school-mediated careers-related employer engagement activities. This study is only able to directly test the potential for academic impact on a short-term horizon. However, indirect support for other channels might be identified via evidence of change in student study and career choices and evidence of change in student attitudes and school-engagement more generally. While career talks in the exam year are unlikely to be the largest channel through which employer engagement activities can support academic attainment, it is plausible that additional activities will boost self-confidence and determination to revise in the months immediately leading up to high-pressure examinations.

Literature suggests that career talks are best when schools support them and prepare students for them. In our intervention we asked schools to carry out the talks using this good practice, emphasising the link between education and future success. Research also suggests that career talks tend to add most value when they take place in a career-rich environment, when students say the talks are helpful at the time, and when students are lower attaining or from disadvantaged backgrounds, pointing towards subsample hypotheses that we can explore through this study.

3. Methodology

This section describes our approach to the trial. It explains how the trial and intervention activity were designed, the three different data sources that would be available to assess possible outcomes, how schools were recruited for the trial and the subsequent sample size available for different analyses, given drop-outs and minor data quality issues. Key features of the intervention and control group are presented and contrasted: socio-demographic background, predicted GCSE grades and prior exposure to employer engagement careers activity. Finally, we explain our approach to the statistical analysis and summarise the power calculation estimates, identifying the minimum effect size on academic outperformance that such a trial was likely to be able to identify.

Trial and intervention design

The trial was established to investigate whether taking part in three volunteer-delivered employer career talks could enhance academic attainment, by influencing and enhancing young people's positive attitudes towards education, career choices and themselves. Career talks are a particularly promising activity to investigate as longitudinal analysis has demonstrated that even small-scale career talk activity can support wage increases ten years on (Kashefpakdel and Percy, 2017). The small scale and relatively standardised nature of career talks is particularly suitable for an RCT design; a small, well-contained intervention also reduces the risk of contaminating factors from adjacent activities.

The total time required for students in the intervention group was intended to be around three hours, with around an hour per talk and some time for the follow-up survey. The hour per talk is made up of about 20-30 minutes of time with the volunteer and the recommended preparation and debrief time for students in a classroom setting.

It was designed as a cluster RCT where students in UK secondary schools were randomised to receive either the intervention or to be part of a control group. Participating schools were asked to divide an equal number of Year 11 students, i.e. those aged 15-16 due to sit their KS4 national examinations, so both the intervention and the control group had mixed academic abilities. Schools generally chose to use their form groups or tutor groups to undertake this randomisation. Students in the intervention group received three career talks from three separate external speakers arranged on top of any other career activity taking place, while students in the control group did not receive any extra career talks. Both groups also participated in their schools' ordinary programme of careers activities.

Using the *Inspiring the Future*[5] platform, the research team invited speakers from a variety of sectors including (but not limited to) law, engineering, medical sciences and design. Each speaker visited one of the participating schools between January and March 2018, the term before exam season begins in earnest. Considerable effort was made to ensure the talks had a similar focus and overall structure, while allowing speakers to talk about their own career, sector and journey. Speakers were made aware of the ongoing study and were given a brief which asked them to discuss the advantages of working hard on their studies, revising for an appropriate amount of time and the importance of doing well in exams while talking through their career pathways. Sessions would generally allow for questions and schools were encouraged to prepare students for the talks. Each school indicated that the intervention would take place in tutor or private study time rather than during class. The intervention group took an additional survey after their career talks but before their exams to get their reflections on the talks, which is likely to have acted also as a memory prompt for young people about the talks and their upcoming exams. Other than the three career talks and the additional survey, there were no structural programmatic differences between the groups.

Career talks were deemed the most sensible career activity to use as they require little planning and organisation from the participating schools, compared to career carousels (speed networking) or careers fairs. It is also more straightforward to approximately standardise the format of the career talks resulting in a more reliable RCT.

[5] *Inspiring the Future* is a free and easy way for thousands of schools, colleges and volunteers from the world of work to connect through an online match-making platform. It is run by Education and Employers, the Charity undertaking this research. https://www.inspiringthefuture.org/

Outcome measures

Three different data sources are available during this study to assess possible outcomes. The primary RCT data source is the GCSE results in Maths, English and Science, provided by the school for both the control group and the intervention group. English and Maths GCSE scores are analysed on the standard national scale from 1-9 (where 9 is a better score). Students can be entered for either a 'Double science' GCSE or a 'Triple science' GCSE, in which Biology, Chemistry and Physics subjects are examined separately. In both cases, all the available results for science subjects were averaged to get a single score for science. In line with ethical guidelines, schools and parents were asked for their consent to use the final GCSE results and names of both groups of students for the purposes of tracking. The baseline survey noted students' predicted grades, for later comparison to their actual grades.

The secondary RCT impact data source derives from the students who completed both the baseline survey in December 2017 and the final post-GCSE survey between June and September 2018, allowing us to measure changes in attitude or future planning between the two groups. The third data source is only available for the intervention group: a survey after the talks but before their exams, to understand how participants experienced the intervention and whether they felt any differently as a result. The full questions for the baseline, post-event follow-up survey, and final survey can be found in Annex 1.

The baseline and final surveys asked students about their attitudes towards school and its relevance for their future, their perceived self-efficacy and how many hours they planned on revising (or had revised) before their first exam. The surveys also asked students for the total number of career activities they had taken part in to account for any variation in exposure to careers provision prior to or during the study. Table 3 presents examples of the survey items that were used to measure attitudinal changes. The follow-up post event survey asked students for their feedback on the activities and whether they thought the career talks were useful, as well as several similar questions to the baseline survey.

Table 3: Survey items used to measure attitudinal changes as a result of the intervention

Measure	Survey Items
Self-efficacy/confidence	When I start a new piece of work, I usually feel confident that I will be able to complete it successfully
	How confident are you that there is a job out there for someone with your skills and interests?
Attitudes towards school	Thinking about everything that you have learnt at school during year 10 and Year 11, how relevant do you find what you have learnt in school to your plans for future work and study?
	I always try my hardest at everything that I do at school
	I think school is a waste of time
Career/education expectations	Is there a particular career which you would like to do when you leave education?
Perceptions of career-related learning	Career talks with local business people/volunteers could motivate me to take school more seriously
	Career talks with local business people/volunteers could help me realise the relevance of what I do in school to my future

Participants

Between October and December 2017, schools were recruited for the trial through the Education and Employers' Twitter page and e-bulletin and from the *Inspiring the Future* network of secondary schools. Interested schools then contacted the research team to inquire about the trial and ask for details of how to get involved. Recruiting schools for the trial proved to be difficult, mainly due to the proximity of the study to the GCSE exam period. Despite schools being told the intervention could take place in tutor time, several teachers that expressed an interest in being involved could not convince their senior leadership teams to take Year 11s out of lessons prior to their GCSEs. In addition, two schools apologetically stated that their mock exams had overrun due to adverse weather conditions, and as a result they could no longer fit the careers sessions that had been organised in to their already limited timetable. A total of five schools and 647 Year 11 students were recruited to take part. The intervention group consisted of 307 pupils and the control group contained 340 students, as shown in table 4. Nearly two-thirds of the sample were female as one school was an all-girls school.

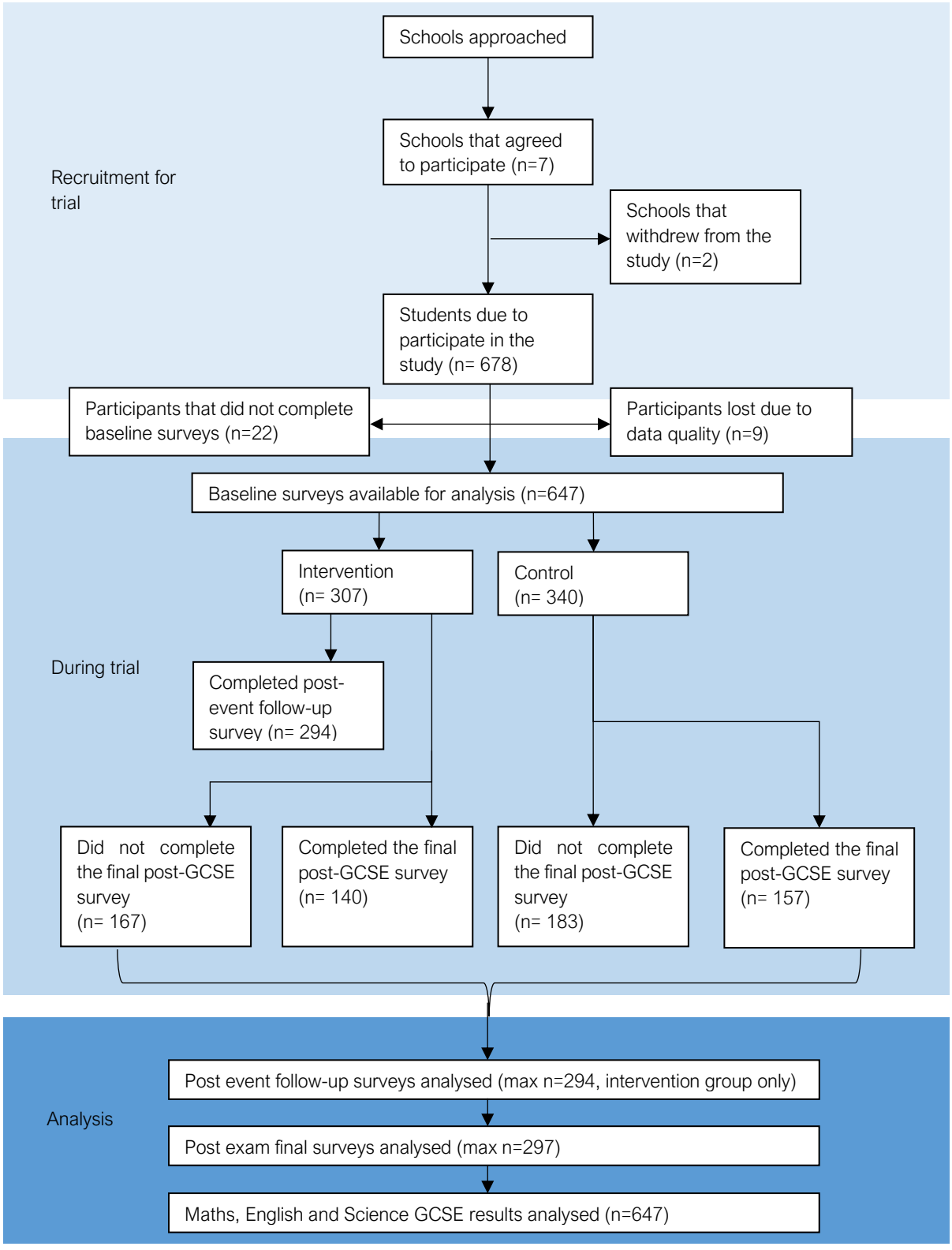
This is a small sample size given the probable size of such a small intervention (just 90 minutes in duration) on students' examination results, which represents the cumulation of hundreds of days of academic education. However, as an initial pilot study, the sample size was adequate for testing the methodology and in identifying key statistical parameters to aid the more precise design of larger studies. It would also be adequate for identifying possible effects on attainment and the channels by which such effects might occur; in particular it would be adequate to dispel fears of a large negative effect, e.g. whereby teachers may worry that such non-academic activities might "distract" students from exam preparations so close to exams starting. Due to the staggered times at which students complete their final GCSE exams, a cohort of young people from three participating schools was not given the final post-GCSE survey. The non-respondents came from both control and intervention groups in all schools. Efforts were made by the participating schools to contact the students and ask them to complete an online version of the survey, but not all students could be reached. In total, 297 respondents answered the final post-GCSE survey, 140 in the intervention group and 157 in the control.

Figure 2 details the flow of participants through the trial from recruitment through intervention to analysis. As is often the case in field trials, a small number of respondents had to be removed for reasons of data quality. For instance, where it was unclear whether an individual was in the control group or the intervention group due to inconsistency in school returns, where data were missing for predicted or actual GCSE results or some other necessary input factor, or where there was sufficient ambiguity in recorded names that it was not possible to confidently align responses across the data input sources (baseline survey, follow-up survey for the intervention group post-intervention, final survey, and GCSE results).

Table 4: Distribution of participants by geography and gender

Region	Sample		Intervention			Control		
	Schools	Students	Male	Female	Prefer not to say	Male	Female	Prefer not to say
Greater London	1	85	15	14	0	27	28	1
South West	1	97	21	20	0	26	30	0
East Midlands	1	145	41	36	0	22	45	1
South East	2	180	42	44	1	35	57	1
		140	0	73	0	1	66	0
Total	5	647	307			340		

Figure 2: Participant flow diagram RCT



School and pupil characteristics

To understand the impact of career-related learning activities on the educational outcomes of participants, the baseline survey asked both groups questions about their socio-demographic background, the number of career-related activities they had previously taken part in and their predicted grades.

Table 5 presents the distribution of responses asking participants if their parents had attended university and whether they had ever received free school meals (FSM), as a proxy for low parental income. Both questions were based on social class and disadvantage measures designed and used by the Organisation of Economic Development (OECD) and the Department for Education respectively. 51.8% of students in the control group had parents that attended university, as opposed to 38.5% in the intervention group.

The distribution of participants on FSM was similar amongst both groups. 11.5% of participants were either eligible for FSM at the time or prior to the study. This is only slightly below the Department for Education's (DfE) national average of secondary schools for January 2018, which was 12.4%[6]. As Table 6 shows, the sample contained more participants that identified as 'Black or Black British', 'Mixed' and 'Chinese' than the national average. There were twice as many students that identified as 'Black or Black British' in the control group than the intervention group.

Table 5: Distribution of participants on FSM and/or attended university (n=647)

Answers	Participants with at least one parent that attended university			Participants that are or have been entitled for FSM		
	Intervention	Control	Average total	Intervention	Control	Average total
Yes	38.8%	51.5%	45.4%	12.4%	11.2%	11.8%
No	45.3%	34.4%	39.6%	80.8%	80.3%	80.5%
Don't know	15.6%	12.4%	13.9%	6.8%	6.5%	6.7%
Preferred not to answer this question / Did not answer	0.3%	1.8%	1.1%	0.0%	2.1%	1.1%

Table 6: Ethnicity of randomised controlled trial participants (n=647)

	Intervention group	Control group	Average total	DfE 2018 National Average
White (British, Irish, other White background)	76.9%	72.4%	74.5%	74.2%
Asian or Asian British	9.4%	9.4%	9.4%	11.0%
Black or Black British	4.6%	10.0%	7.4%	5.8%
Mixed	7.2%	5.3%	6.2%	5.2%
Chinese or other ethnic group	0.7%	1.8%	1.2%	0.4%
Other	1.0%	0.0%	0.5%	1.8%
Prefer not to say	0.3%	1.2%	0.8%	1.5% (Unclassified)

[6] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/719226/Schools_Pupils_and_their_Characteristics_2018_Main_Text.pdf

Table 7 shows the predicted grades of participants in their English, science and maths GCSEs. On average, students were predicted slightly higher in maths than science and English. Participants in the control group were predicted higher in all three GCSE subject areas than participants in the intervention group.

As Table 8 shows, a significant number of participants had never taken part in a career activity that they recalled and recorded on our surveys. Less than half of participants had taken part in more than two career activities that had lasted less than a day. Participants in the control group were more likely to have taken part in a career activity than students in the intervention group.

Given the randomisation approach, it is unclear whether the differences between the groups in the above tables represent random statistical variation given the modest sample sizes or whether it reflects structural (perhaps unconscious) differences in how schools assign students to form/tutor groups. Nonetheless, in the analysis section it is possible to test whether any findings vary along key sociodemographic axes.

Table 7: Predicted grades of participants in English, maths and science (n=647)

Predicted Grade (Lowest – Highest)	Intervention			Control			Average total		
	English	Science	Maths	English	Science	Maths	English	Science	Maths
1	0.7%	0.7%	0.7%	0.0%	0.0%	0.6%	0.3%	0.3%	0.6%
2	0.3%	0.7%	1.3%	1.2%	0.6%	0.9%	0.8%	0.6%	1.1%
3	4.6%	4.6%	2.0%	2.6%	3.5%	2.1%	3.6%	4.0%	2.0%
4	20.8%	23.5%	25.1%	9.7%	9.7%	8.5%	15.0%	16.2%	16.4%
5	23.5%	21.8%	18.6%	13.8%	12.1%	13.5%	18.4%	16.7%	15.9%
6	11.4%	16.0%	16.0%	16.5%	20.0%	19.4%	14.1%	18.1%	17.8%
7	21.5%	16.6%	17.6%	30.3%	32.1%	27.6%	26.1%	24.7%	22.9%
8	14.7%	8.1%	13.4%	23.8%	15.9%	22.9%	19.5%	12.2%	18.4%
9	2.6%	8.1%	5.5%	2.1%	6.2%	4.4%	2.3%	7.1%	4.9%
Average	5.75	5.69	5.78	6.38	6.38	6.44	6.08	6.05	6.12
Std. Deviation	1.64	1.72	1.7	1.5	1.51	1.54	1.60	1.65	1.65

Table 8: Distribution of participants on whether previously taken part in career activities prior to the trial (n=647)

Number	How many times have you taken part in activities which last MORE than a day?			How many times have you taken part in activities which last LESS than a day?		
	Intervention	Control	Average total	Intervention	Control	Average total
0	32.2%	28.5%	30.3%	21.8%	17.1%	19.3%
1	33.2%	30.3%	31.7%	29.3%	22.1%	25.5%
2	17.6%	21.5%	19.6%	18.9%	18.2%	18.5%
3	5.2%	7.4%	6.3%	10.7%	14.4%	12.7%
4	2.6%	2.1%	2.3%	5.2%	8.2%	6.8%
5	3.6%	2.6%	3.1%	6.8%	5.3%	6.0%
6	0.3%	1.2%	0.8%	1.3%	4.4%	2.9%
7	1.0%	2.1%	1.5%	1.0%	1.5%	1.2%
8	0.0%	0.0%	0.0%	1.0%	1.5%	1.2%
9	0.0%	0.9%	0.5%	0.3%	0.6%	0.5%
10+	4.2%	3.5%	3.9%	3.6%	6.8%	5.3%
Average	1.64	1.81	1.73	2.16	2.83	2.51
Std Dev.	2.23	2.28	2.26	2.31	2.72	2.56

GCSE results analysis approach

Analysis of the GCSE attainment data involves three main analytical choices: control variables; outcome variable construction; and choice of regression analysis. Other analyses are largely straightforward, drawing on frequency calculations (i.e. percentages of survey respondents in particular categories), with chi-squared tests used to compare how changes in proportions over the year varied between the control and intervention group and ANOVA f-tests used to analyse change in planned revision hours across multiple response values for the intervention group.

Control variables

Free school meals and gender are included as control variables (specifically as 0/1 dummy variables); the point estimates presented for the effect sizes can be thought of as the average effect if we only compare like genders and like status with respect to free school meals (i.e. averaging the effect size of the intervention across two subsets, one that only compares boys with boys and one that only compares girls with girls).

Most analyses are presented as direct correlations throughout this paper, adopting a subsample approach for analysing the importance of different variables, such as socioeconomic background or prior exposure to career talks. The subsample approach is preferred for key questions connected to the theory of change because it makes the least assumptions about model structure across the subsamples and its results can be more intuitively quantified and explained to non-technical audiences. However, we note limitations in this approach, such as sample size reduction and loss of informational efficiency if we were to make assumptions regarding structural consistencies between the subsamples.

Outcome variable construction

Predicted GCSE results at the start of Year 11 and actual GCSE results at the end of Year 11 were collected for all students across three subjects (English, Maths and Science), covering students who were randomly assigned to participate in three career talks and students who were not.

The outcome variable is defined as student "outperformance relative to predictions", i.e. the variation or delta between actual and predicted results in those three subjects, with each subject analysed and reported individually. This allows us to capture variations in academic starting point, and effect sizes are reported as proportions of a grade. For instance, an effect size of 0.1 is equivalent to three students out of a class of 30 outperforming their predicted grade by one grade on average. In this study it is important to analyse outperformance as we observe differences between predicted attainment in the two groups (see Table 7; while modest in absolute terms these differences are material given the likely effect size of the intervention) and because with this sample size and data collection methodology it is impractical to collect data on all factors that influence attainment. By including an attainment-related prediction, the majority of significant drivers of attainment – at least as known to teachers – will be incorporated in the analysis and our results will more correctly identify the impact of the intervention.

One concern with the above methodology is the possibility of "regression to mean" bias, where students who are predicted low grades might tend to outperform more easily. This is a common concern with tests based on before and after questionnaires.[7] This issue does not apply exactly in this case – the relationship between a professional's prediction of a grade and the future actual grade is not the same as that between "before intervention questionnaire" and a "post intervention questionnaire". We adopt the described approach as quantitative results can then be expressed in more intuitive, school-friendly language.

Choice of regression analysis

A regression approach with control variables is chosen to make full use of the sample size (which is already modest relative to the effect sizes under consideration), rather than adopting a matched pair approach. A randomisation approach should also ensure that the samples are structurally comparable with the frequency tables described above. However, it is important to account for clusters within our sample.

The approaches to grade prediction, as well as other potential aspects of this trial, may be structurally different from school to school and from group to group. For instance, some may err towards pessimistic predictions and some to optimistic predictions. On that basis, we adjust for fixed effects at both the level of intervention vs control group allocations (often at or within individual form groups) and at the school level.

Specifically, we apply a three-tier mixed-effect model, in which the lowest tier is the student, nested within the second tier, which is the students' randomised group (where the model intercept is allowed to vary), nested within the highest tier, which is the students' school (where the model again allows the intercept to vary).

One caveat to the form group and intervention level clusters is that predicted grades would often have been led by the teacher in the relevant subject area, which may be a different clustering to the form groups.

[7] See, for instance, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1121605/

Future RCTs could additionally capture these groups in order to include cluster tiering on this basis for each subject.

Random assignment took place at either the form group level (on which data was collected) or at another class level depending on the school (on which data was not collected). The size of each cluster is given in Table 9.

Table 9: Cluster size across the sample

School and Class	Intervention Cohort	Control Group cohort
School 1 - A	8	16
School 1 - D		1
School 1 - E	7	11
School 1 - P	8	11
School 1 - S	6	17
School 2 - A	13	10
School 2 - B	16	7
School 2 - C	9	13
School 2 - D	15	8
School 2 - E	12	12
School 2 - F	8	17
School 3 - A	16	4
School 3 - C	2	25
School 3 - D	23	2
School 3 - P		25
School 5 - AT	22	
School 5 - GG	15	
School 5 - HD	12	
School 5 - LL	13	
School 5 - MB	15	
School 5 - MR		15
School 5 - OA		14
School 5 - PS		13
School 5 - SB		15
School 5 - SC		11
School 4 - 1a		15
School 4 - 1b		22
School 4 - 1c		17
School 4 - 1d		21
School 4 - 1e		18
School 4 - 2a	25	
School 4 - 2b	25	
School 4 - 2c	22	
School 4 - 2d	15	
Total (# of students)	307 (22 clusters)	340 (25 clusters)

Power calculation

Best practice in large-scale RCTs – particularly cluster trials – is to initially conduct a smaller, pilot RCT in order to estimate key parameters that allow future RCTs to be properly planned, such as the intracluster correlation coefficient (ICC), which calculates the likely effect size to test for and its standard deviation.

This particular RCT serves well as such a pilot, enabling us to demonstrate and test a methodology both for conducting the experiment and for analysing the results. We can then gather information to allow a more structured design for hypothesis testing in future RCTs.

On this basis, our sample size was driven by funding available rather than by what would be required to identify a specific effect. At the outset, given an estimated sample size of 800 students, we could conduct a power analysis of the subsequent trial as below:

- Power = 80% (i.e. Probability of failing to reject the null hypothesis under the alternative hypothesis. Type II error rate.)
- Significance threshold = 0.10 (Threshold probability for rejecting the null hypothesis. Type I error rate. Two-tailed.)
- Proportion of students that are in intervention groups: 50%
- Standard deviation across population = 1 (i.e. Prior to any experimental insight, imagine that about 70% of the time, the teacher-predicted grade at the start of the year will be within 1 grade of the actual achieved)

A sample size of 800 and no clustering would identify an effect size of around 0.175 grades "out-performance" or "under-performance" relative to expectations). In other words, a rejection of the null hypothesis that the intervention does make a difference on KS4 attainment would only be able to consistently reject effect sizes of 0.175 or higher. Smaller effects would not be effectively identified.

However, because this is a clustered trial, some of the variation between individuals' outperformance or underperformance will be driven by their sharing a particular form or school so, in practice, only a larger effect size would be identifiable. This impact is driven by the ICC parameter and is notoriously hard to estimate without experimental trials such as this one. Given that uncertainty, we examined the implications for the effect size we would be able to identify across a range of ICCs, assuming 25 clusters in the intervention group and 25 in the control group:

- ICC of 0.05: ~0.23
- ICC of 0.10: ~0.28
- ICC of 0.15: ~0.32

While we did not know what size effect might be expected prior to the start of the trial, it seemed unlikely it would be as large as a third of a grade, driven solely by three extra career talks 3-6 months prior to the exam. Nonetheless, the study has significant value as a pilot, identifying probable RCT parameter values as above to aid the more precise design of future larger-scale trials and to inform current hypotheses about the possible impact of career talks.

4. Data analysis

This section outlines the findings across the different surveys, ordering the insights against the theory of change. First of all, with respect to the employer career talks themselves, we report how students rated the quality of the talks and whether the talks had informed their education and career choices, including the importance of being prepared for the talks.

In terms of student attitudes towards themselves and their education, we describe whether students had found the talks helpful and then contrast the differences between intervention group student attitudes before the talks and after the talks, before analysing the difference between the control group and the intervention group.

We then focus on planned weekly revision hours as a proxy for how seriously students are taking their exam preparation. We test whether intervention group students reported greater planned revision hours immediately after the career talks than at the start-of-year baseline survey. Then we see how the control group and intervention group vary with respect to any change in reported revision hours after the exams compared to what they had planned at the start of the year.

This is followed by analysis of the differences between the control group and the intervention group with respect to out-performance on predicted GCSE grades and whether, within the intervention group, altitudinal shift or weekly revision hours planning can be related to GCSE out-performance.

Finally, we present some initial subsample analyses by student sociodemographics and attitude and explore the possibility that extra career talks might show diminishing returns to scale among those students who had already experienced several such short duration activities before the intervention.

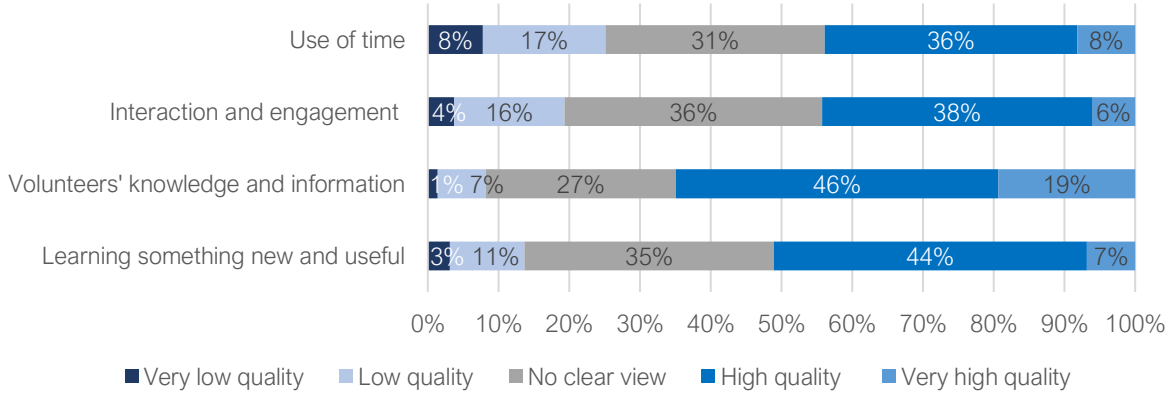
Rating of the intervention

Where students had a view of the three employer career talks they participated in, positive responses significantly outweighed negative responses, although we highlight that around a third of students had no opinion on the quality of their experience.

Students felt particularly positive about the volunteers' knowledge and information, with 65% of the students finding this element of the career talk high or very high quality, vs 8% having critical opinions. Just over 50% felt the talks had been positive for learning new and useful information, compared to 14% with critical opinions. The data also shows that 44% of the students felt that the career talks they received had been a good use of their time, with only around half that number (23%) stating it had not been a good use of their time. Considering these are Year 11 students fast approaching their GCSE exams and reflecting on the talks in hindsight, it is likely that their time felt particularly precious.

No significant trends in these quality judgements were found according to the students' gender, ethnicity or number of activities taken part in previously.

Figure 3: Rating of the intervention in four areas (n=294)



It is also useful to combine these four questions to create a single metric, which captures the student's view on the quality of the talks overall. This is a 1-5 coding for each question, in which 1 is very low quality, 2 is low quality, 3 is no clear view on high or low quality, 4 is high quality, and 5 is very high quality, averaged to give an overall score from 1-5 (the average value in the cohort is 3.4, with a sample standard deviation of 0.7). This can be compared in future analyses to see whether students' perceived quality of the talk is relevant to the impact the talks have.

Impact on career and education choices

Student feedback on the talks

Intervention group students were asked whether the employer career talks impacted on their career and education choices. The majority of students had a sufficiently fixed notion of what they plan to do (whether precise or not) so the talks did not impact their choice. However, 41% of students felt that the three talks had played a role in reflecting on their education pathway choices after finishing school aged 17 or 18 and on their career choices, the jobs they aspire to one day. While these are major life decisions that we would not expect young people to change lightly, it is noteworthy that a total of 7% (20 people) said the talks had made them change their choices in either career or education pathway, of whom 3 people said it changed their choices in both areas.

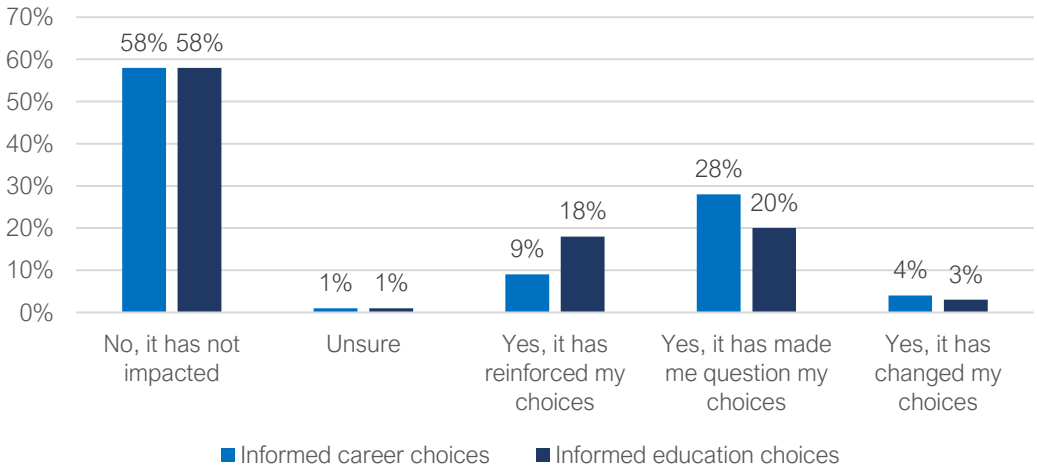
Evidence on the importance of talk preparation

Part of the theory of change is that talks should add more value if students are prepared for them. By scoring and combining the possible responses above, we can test this hypothesis on the sample. If students reported a change to their choices, the impact is scored as a 5, questioning is scored as a 2, reinforcing is scored as a 1, and anything else scores 0.

By this analysis, reporting that teachers prepared students for the talks is correlated with greater reported impact on choices. The 74 who reported teacher-support preparation scored 1.13 on average, whereas the 147 who did not, scored only 0.66 (statistically significant differences, p-value < 0.01 ANOVA f-test). Those who were unsure (73) scored in the middle, 0.82. To contextualise these figures, the difference between being prepared and not being prepared is the equivalent of an additional 10% of the sample switching from saying it had no impact to reinforcing their choices, a further 10% switching from no impact to questioning their choices and a further 5% switching from no impact to changing their choices – in other words one in four students getting significant value from the talks.

Higher quality talks, as defined by students in the "Rating of the intervention" section, are also more likely to be correlated to impact on student choices – a one standard deviation increase in the average quality score correlates to the equivalent of around 10% of the sample switching from no impact to questioning their choices (p-value from a bivariate linear regression < 0.01; co-efficient 0.32).

Figure 4: Impact of intervention – education and career choices (n=294)



Evidence from comparison to the control group

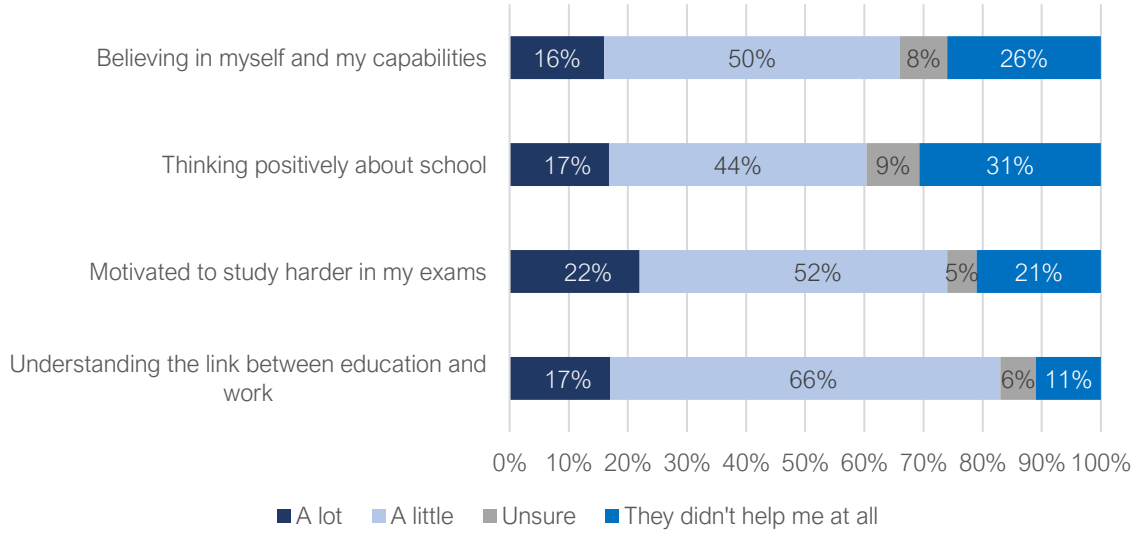
Students were asked at both the baseline and the final survey whether or not they thought there was a particular career out there that might suit them. Overall, students became very slightly more cautious on this question as the year progressed: 1%pt fewer answered 'yes' among those who had the three career talks (total n = 140; a decrease from 81 to 80). On the face of it, this might suggest negligible impact from the career talks on such confidence, while acknowledging that we do not know if the earlier confidence was warranted. However, the importance of control group comparisons becomes apparent when we see that 6%pt fewer students among the control group answered Yes (total n = 157; a decrease from 94 to 85), as opposed to the 1%pt decline among those in the intervention group – the difference between the two groups is visible and fits with the theory of change but is not statistically significant. Given that over half of the students feel there is a career that would suit them, it is helpful to examine the subset of students who do not. In the control group, out of six students who said "no" at the start of the year, none switched their answer to "yes" over the year, whereas two out of eight of those who had said "no" at the start of the year in the intervention group had switched to a "yes" and a further two switched to "unsure", with 7 and 12 respectively changing their mind in the other direction (statistically significant at the 15% level). This suggests that the career talks did have a small impact on strong views on career-fit confidence, but it is unclear how to interpret students becoming more unsure. For instance, it may be positive if their earlier confidence was unwarranted and the career talks helped them realise this; or it may be negative if confusing information from the career talks has caused them to doubt themselves for no good reason.

Impact on student attitudes

Student feedback on the talks

The majority of students reported that the employer career talks helped them have more positive attitudes towards themselves and their education. On average, 71% of students stated the talks impacted on their attitudes towards school, work and their own abilities, with 83% stating it helped them understand the link between education and work. Over 70% of participants said the talks made them more motivated at school to some extent, with a small but significant group of people saying it made them a lot more motivated for exams (22%) and a lot more positive towards school (17%). Similarly, 50% of students felt the intervention made them believe in their abilities a little more, while 16% felt it improved their self-belief a lot.

Figure 5: Responses to the question 'To what extent did career talks help you with …' (n=294)



Relationship between talk quality and student feedback on attitudinal impact

Student assessment of talk quality, as defined in the section "Rating of the intervention", is correlated with whether or not students said the talks helped them with the four questions in Figure 5. To demonstrate this, the four questions in Figure 5 are combined into a single score marking the attitudinal impact: the questions are equally weighted, with "a lot" answers scoring a 5, "a little" scoring a 2, "unsure" scoring a 1, with "no help" scoring a 0. The effect is such that a one standard deviation increase in the average quality score correlates to the equivalent of around 25% of the sample switching from no impact to questioning their choices (p-value from a bivariate linear regression < 0.01; co-efficient 0.75). Being prepared for the talks is directionally correlated with greater self-reported impact on attitudes: 2.2 rather than 2.0, but this effect is not statistically significant (p-value 0.18).

Evidence from comparison to the control group

At the start of the year, 15% of the control group and 16% of the intervention group agreed or strongly agreed that school was a waste of time (considering just the subsample of students who also completed the final survey in sufficient quality; n=297 qualifying students). By the end of the year, both groups had become more positive about school, with only 8% of the control group and 6% of the intervention group agreeing or strongly agreeing. This amounts to a 64% reduction of cynical students in the intervention group, compared to a reduction of 48% in the control group. Considering how specific students changed their mind over the year, as opposed to overall averages, we see a modest net improvement among intervention group students of 10%pts not thinking school is a waste of time, compared to 7%pts in the control group (p-value 0.18).

A more targeted question to identify the same issue was: "Thinking about everything that you have learnt at school during Year 10 and Year 11, how relevant do you find what you have learnt in school to your plans for future work and study?". Again, similar slight improvements are noted relative to the control group. Only 45% of the control group agreed that it was usually, very or highly relevant at the end of the year, relative to 51% at the start of the year. There was no such decrease in the intervention group, where the proportion remained stable at 53% at the end of the year. Considering how specific students changed their mind over the year, as opposed to overall averages, we see a very small net decline among intervention group students of 2%pts compared to 9%pts in the control group, but this finding is not statistically significant given that students quite commonly changed their mind on this question in both directions.

When we look at the students who do not disagree "that they always try their hardest at school", there is a particularly clear increase in the intervention group (from 81% to 92%) with relatively little change in the control group (90% to 91%). Considering how specific students changed their mind over the year, the impact of the intervention is statistically significant at the 15% level. In terms of a proactive mindset more generally, both sets of students show an increase in: "I always look out for opportunities to learn more about my future" – but again, with a more positive improvement in the intervention group (64% to 82%, an improvement of 18 percentage points, as compared to 68% to 80%, an improvement of 12 percentage points). Considering how specific students changed their mind over the year, as opposed to overall averages, we see a modest net improvement among intervention group students of 7%pts compared to 1%pts in the control group, but this finding is not statistically significant given that students changed their mind on this question in both directions.

Positive improvements over the year are similarly noted for students' sense of determination. The proportion agreeing or strongly agreeing with: "When I start a new piece of work, I usually feel confident that I will be able to complete it successfully" increased from 73% to 84% in the control group and from 70% to 86% in the intervention group (not statistically significant). The only feature in which we examined change over the year where there was no positive delta between the intervention group and the control group is: "I don't give up easily – even when I find a task difficult", where both groups improved equally – 16-17 percentage points over the course over the year. Overall, the career talks appear to be driving mostly directionally positive, with modest improvements on students' self-efficacy and positive attitude towards schooling and career confidence relative to what happens for students not participating in such career talks.

Impact on planned weekly revision hours

In the baseline survey, students were asked to predict the number of hours per week they would spend revising for exams in the month before their first exam. During the analysis, we identified a small number of students (5), who had reported they planned on revising over 75 hours a week. It seems unlikely that such responses have been thoughtfully completed and large values risk biasing the analysis, as averages and regression analyses are disproportionately influenced by extreme values. As a result, self-reported estimates were capped at 75 hours per week in both the baseline and the follow-up survey. In general, this question is intended less to capture an exact plan of the number of hours students are thinking of, but more to capture quantitatively a sense of how seriously they plan to take the process.

Evidence from the follow-up survey

When asked about their employer career talks, 41% of students said the talks had affected their plans to revise a little, with 8% stating it affected their plans a lot (43% said there had been no impact and 7% were unsure). By comparing the students' estimates of their planned hours, it is possible to test this response more quantitatively.

On average, students who attended the three career talks reported an increase of 2.7 weekly hours on a baseline mean of 13.7 hours (i.e. a 20% increase in planned revision hours). The difference is statistically significant with a p-value below 0.05 (using paired t-test, both with bootstrapped confidence intervals and standard confidence intervals). The null of no differences in medians is also rejected via non-parametric tests (Wilcoxon Signed Rank Test, p-value < 0.01). Student estimates of their planned revision hours are lent some credibility in that the deltas relate to whether students said the talks had an impact – those who had said the talks had "a lot" of impact reported an average increase in 5 hours as compared to 3 hours for "a little" impact and 1 hour for no impact.

The quality of career talks, however, did not appear to have direct impact on the planned number of hours for revision. Across the intervention group there was no statistically significant effects on plans to revise if students thought the talks were higher quality or they were better prepared for them. Similarly, if students thought the talks influenced their choices or attitudes, there was no significant impact on their plans to revise.

Table 10: Planned weekly revision hours, baseline versus follow-up survey, intervention group only (n=294; capped answers)

Baseline reported weekly revision hours		Post-intervention reported weekly revision hours	
Hours	%	Hours	%
0-4	11%	0-4	6%
5-9	31%	5-9	16%
10-14	26%	10-14	26%
15-19	6%	15-19	16%
20-24	10%	20-24	16%
25-34	9%	25-34	12%
35-44	4%	35-44	4%
45+	2%	45+	1%
Unknown	-	Unknown	2%
Average	13.7 hrs	Average	16.4 hrs
Standard deviation	11.7 hrs	Standard deviation	10.5 hrs

Evidence from comparison to the control group

By drawing on the final survey (completed in sufficient quality by 297 qualifying students), it is possible to test the principle that career talks do increase planned weekly revision hours more robustly, since students might have changed their mind during the year in ways unrelated to the career talk intervention.

This analysis suggests that students who participated in career talks saw a modest increase of around 1.5 hours in their reported revision hours in the week prior to their first GCSE compared to what they had envisaged doing at the start of the year. With the average baseline planned hours at 17.8 per week for the students who completed the final survey, this suggests an increase of 9% in planned hours as a result of the intervention. Comparing the difference in means via a two-tailed two-sample T-test, the intervention group reported more weekly revision hours (in hindsight) than the control group (20.8 vs 16.6 hours, significant at the 1% level), as compared to 19.1 and 16.6 hours at the baseline respectively (significantly different at the 15% level). The change over the year is not statistically significant via a two-tailed test between the two groups, but if we test the single-tailed hypothesis that the talks increased revision hours the results are significant at the 15% level.

While the standard deviations are high (i.e. the finding should be understood as indicative and directional) and the reduction in data completeness introduces some uncertainty, the results, as shown in table 11, are in line with the findings from the follow-up survey which was completed by the majority of students in the intervention group and noted a statistically significant increase in planned revision hours after the career talks.

Importantly, we can also affirm the theory of change about the importance of self-reported revision hours for academic outperformance. The table below reports the coefficients from our standard three-tier mixed effects regression model but where the dependent variable is the student's actual GCSE grade and the independent variables are FSM, gender dummy variables and reported revision hours, see table 12.

This analysis suggests that every 10 additional planned weekly revision hours are typically worth around 0.3 of a grade in actual attainment. Hindsight weekly-revision hours appear to be less clearly correlated, with 10 worth nearer 0.1 to 0.2 of a grade, suggesting that "planned weekly revision hours" in advance of exams is a better proxy for how seriously students intend to study. A statistically significant, but smaller impact, is also noted on academic outperformance, suggesting that teachers' initial predictions do not estimate fully how motivated students might be to revise for their final exams or the impact of this.

Table 11: Average increase in reported weekly revision hours (n=297)

	Sample size	Average increase in reported weekly revision hours vs baseline survey (all answers capped at 75)	Standard deviation
Control Group	157	0.1	10
Intervention Group	140	1.7	16
Total	297	0.8	13

Table 12: Correlation between reported weekly revision hours and academic performance

	Planned weekly revision hours at baseline (n=647)		Reported weekly revision hours in hindsight at final survey (n=297)	
English	0.025***	0.00	0.010	0.14
Maths	0.033***	0.00	0.015**	0.04
Science	0.028***	0.00	0.017**	0.02

*The statistical-significance is denoted: *** = 0.01 or better; ** = 0.05 or better; * = 0.10 or better*

Impact on academic attainment

The predicted grades and the difference between predicted grades and actual grades (the delta) suggest that randomisation has worked adequately well; the predicted grades between intervention and control group are within around half a standard deviation (see Table 23). Nonetheless, those in the intervention group do have, on average, slightly lower predicted grades. Within this sample, we also observe an optimism bias with teacher predicted grades; on average, students gained grades around one third or half a grade below where predicted (equivalently – achieving one grade lower on average than predicted in every second or third subject).

Turning to the intervention itself, we also see that the intervention group very slightly outperformed expectations relative to the control group. In English, they performed 0.04 of a grade better, in Science, 0.01 of a grade better, and no difference in maths. However, this delta is dwarfed by the standard deviation of 1.2 to 1.3 grades, such that t-tests are unable to affirm the outperformance levels as statistically different from zero.

Table 13: Analysis of academic performance – Predicted and actual grades

Value	Intervention	Control group
Sample size	307	340
Average Predicted English Grade	5.75	6.38
Average Predicted Science Grade	5.69	6.38
Average Predicted Maths Grade	5.78	6.44
Average English delta vs predicted grade	-0.34	-0.38
Average Science delta vs predicted grade	-0.32	-0.33
Average Maths delta vs predicted grade	-0.50	-0.50
Standard deviation of Predicted English Grade	1.64	1.50
Standard deviation of Predicted Science Grade	1.72	1.51
Standard deviation of Predicted Maths Grade	1.70	1.54
Standard deviation of English delta	1.21	1.20
Standard deviation of Science delta	1.23	1.09
Standard deviation of Maths delta	1.27	1.11

Regression analysis

Our primary regression model seeks to predict students' grade outperformance relative to teacher predictions via a three-tier mixed effects model described in the methodology section. We also control for whether the student confirmed themselves as on FSM and by gender. The intervention is included as a dummy variable, and the dependent variable is the delta between predicted and actual grades (where a positive delta represents outperformance vs predicted grades), conducted separately for the three subjects involved. The key coefficients from the regression are captured in the table below:

Table 14: Key coefficients from the regression analysis (n=647)

Outperformance by Subject	Intervention	FSM dummy	Male gender dummy
English	0.09	-0.14	0.01
Maths	0.01	-0.21	-0.06
Science	0.02	-0.11	-0.13

*The statistical-significance is denoted: *** = 0.01 or better; ** = 0.05 or better; * = 0.10 or better*

The analysis shows a directionally positive impact from the intervention, strongest on English at just under 0.1 of a grade. To contextualise this figure, it is the equivalent of three students in a class of 30 outperforming their predicted grade by one more grade than they would have done otherwise. For Maths and Science, the effect is much smaller, around the tenth of the size. At this sample size and trial parametisation, none of the drivers are significant at the 10% level or better, except for the clustering tiers which are all significant at the 5% level or better, compared to an approximate LR test, compared to a direct linear model.

The average effect size across the three subjects is the equivalent of one student in a class of 25 outperforming all three subjects by one grade. This average assumes the variation between the coefficients in the regressions represents chance variation rather than revealing structural drivers such as, for instance, the English GCSE was easier to influence than other subjects.

Self-reported talk impact

Students who reported an increase in motivation as a result of the career talks saw slightly higher academic outperformance vs the control group, relative to the average outperformance described above (0.14 of a grade effect size from the intervention for English, 0.05 for maths, 0.05 for Science; sample size 557; not statistically significant). However, there was no such distinction if reported planned weekly revision hours had increased by five or more hours relative to baseline as opposed to four or fewer hours.

Analysis by school

Other research (The Careers and Enterprise Company *What Works* series, 2016-2018; Percy and Kashefpakdel, 2018) has suggested that how career talks are carried out and the broader careers education context in which they take place can make a big difference to their impact. As such features are often driven at the school-level and by the individual in the school who takes the lead on coordinating employer activities, we might expect to see significant variation in impact at the school-level, while noting that all schools participating in an optional pilot like this are likely to be more engaged than many other schools.

Such variation is observed across the schools in this trial sample as well. While the reduced sample size for each school relative to the overall sample makes it harder for variations in outcome to be assessed as statistically significant, it is important to highlight that one school with a large number of students in its sample size did have statistically significant and positive effects across all three subjects, and that no schools had statistically significant and negative effects in any subjects (using the same regression model as described in the regression analysis section, but without the clustering at school-level). The results for the school with significant positive effects are given below and suggest the intervention, in that school, helped students to outperform their predicted grades, on average, by 0.6 of a grade. In other words, in a class of 30 students, around 18 students might outperform their predicted grades in English, Maths and Science by one grade more than they would have done otherwise.

Table 15: Results from the one school with significant results for the intervention

Subject	Effect size (outperformance delta vs predicted grades)	P-value
English	0.59***	0.01
Maths	0.70**	0.03
Science	0.56**	0.03

*The statistical-significance is denoted: *** = 0.01 or better; ** = 0.05 or better; * = 0.10 or better*

While detailed analysis of why this school saw particularly impactful career talks relative to the other schools would require qualitative follow-up with each school, insights can be gained from the reports made by the students about their prior experience and the career talks. To make this more consistent, we explore the comparison versus all schools with a similarly large sample size of respondents to the follow-up survey and with a lower average effect size than the school in the table above.

It appears, subject to study in larger trials, that the school with the strongest impact from career talks was a school whose intervention group students had the most prior experience across long- and short-duration employer encounters combined. Students also reported the talks as higher quality in this school as compared to other schools with similarly large sample sizes. In particular, the volunteers were more commonly described as having good or excellent knowledge and information and as having good or excellent interaction and engagement with the students (e.g. 4 or 5 on a 1-5 scale). The reported, perceived quality of the volunteers appears to be a more important distinction, in terms of this school-level observation, than whether or not teachers prepared students for the career talks. For instance, compared to the school with the least positive impact from career talks, the school with the highest saw 25%pts more students reporting the volunteers as very knowledgeable and informative, and 6%pts more describing them as very engaging and interactive, and students had done more like 4.5 average prior employer activities rather than 3 prior activities.

It is also possible that these effects represent some unusual feature of that sample, such as a quirk of the data or some aspect of implementation or cohort that is not captured in the data and would not be easily identified or replicated. In the small sample sizes at the school-level, such findings are necessarily suggestive rather than conclusive, in line with the spirit of this study as a small-scale pilot RCT.

Variation by student background and attitude

There are a large number of variables around student background and attitude that can be explored across the various aspects of the theory of change present in this trial design: changes in career/education choices; changes in attitude; planned revision hours post-intervention and as reported after the exams; and academic attainment. Within the constraints of this report we focus on the influence of sociodemographic background and student attitude on planned revision hour changes, being both the most statistically significant part of the theory of change identified and to leverage the follow-up survey, which has a higher completion rate than the final survey. Nonetheless, at the subsample level, it becomes increasingly difficult to draw clear conclusions about the small effects involved given the sample size. As such, these analyses are presented indicatively to shape future hypotheses on larger sample size trials, which we hope will be able to explore a broad range of mediating and interaction effects more systematically.

Student socio-demographic background

The effects on weekly revision hours identified in the follow-up survey appear to be related to sociodemographic background, albeit only weakly and with significant variation within each sociodemographic category. For instance, the increase in hours appears to be larger for boys (+4.1 hours) than girls (+1.8 hours), with the difference statistically significant at the 15% level. The effect is also generally larger for those whose parents did not attend university (+4.0 hours vs +1.2 hours) and slightly larger for those with FSM (+2.8 hours vs +2.6 hours) but these are not consistent effects and the differences between the groups are not statistically significant. Analysis of students' ethnicity did not show any meaningful difference; however, there is some evidence that non-white students reported larger increases on average (e.g. +4 hours to +8 hours) than white (e.g. +2), but with significant variation around these averages.

Student attitude about school and their future

Taking part in career talks is associated with a greater increase in weekly revision hours among young people who were more sceptical of education at the start of the year, as shown in Table 16, (statistically significant at 15%).

Table 16: Change in weekly revision hours by self-reported scepticism about school ('I think school is a waste of time') (n=289)

"I think school is a waste of time"	N	Hour change (mean)
Strongly agree	15	5.4
Agree	58	3.0
Disagree	171	3.2
Strongly disagree	45	-0.6

ANOVA f-test [p-value=0.03]

Perhaps related to this finding, students who stated that they try less hard at school also reported a bigger increase in planned weekly revision hours post-intervention (statistically significant at 15%).

Table 17: Change in weekly revision hours by self-reported effort put in while at school (n=289)

"I always try my hardest at everything I do at school"	N	Hour change (mean)
Strongly agree	44	-2.1
Agree	183	3.2
Disagree	56	4.7
Strongly disagree	5	5.2

ANOVA f-test [p-value=0.11]

Young people with less confidence that what they were doing in school would help their future career were more likely to report an increase in weekly revision hours post intervention; with those with least confidence reporting an increase of 7.4 hours in revision plans. However, this effect is highly inconsistent between the groups and the result is not statistically significant.

Table 18: Change in weekly revision hours by confidence in how school work may help their future career

"How confident are you that what you will do in year 12 and 13 will help your future career?"	N	Hour change (mean)
Not at all confident	13	7.4
Quite unconfident	44	5.1
Quite confident	187	2.6
Very confident	44	0.7

ANOVA f-test [p-value=0.20]

Students who were least constructively engaged with thinking about their future seemed to see less effect from the talks, whether in revision planning or in reported impact on attitudes towards education. Similarly, those who said they were always on the lookout for opportunities to learn more about their future reported a bigger increase in planned revision time. Taking these two findings together suggests that students may benefit most from talks when they have some hypotheses to test or at least have some level of optimism with which to engage with talks.

Table 19: Change in weekly revision hours by self-reported interest in learning more about future work (n=289)

"I always look out for opportunities to learn more about my future"	N	Hour change (mean)
Strongly agree	67	4.5
Agree	192	2.6
Disagree	25	-3.3
Strongly disagree	5	0.7

ANOVA f-test [p-value=0.04]

Important differences also appear with respect to planned weekly revision hours and academic ability. For instance, those predicted high passes in English (grades 6-9; n=146) described an increase in revision hours of 1.8 hours per week or a 10% increase on the average amount they had planned during the start-of-year survey, whereas those predicted narrow passing grades (grades 4-5; n=129) described an increase of 3.2 hours, a 32% increase on baseline plans. This relationship is lent credibility by the small number of students predicted to fail English GCSE (grades 1-3; n=18) who described a large increase in revision hours of 7.3 hours – double their average at the baseline survey.

Importance of volume of activity

It is possible to comment on the importance of the overall volume of employer engagement activity by contrasting the impact of the three extra talks depending on how much activity students reported they had done beforehand. Students were asked separately about prior experience of short-duration activities, i.e. less than a day (e.g. career talks, careers fairs, workplace visits, speed networking/careers carousels) and long duration activities, i.e. more than a day (e.g. mentoring, job shadowing, work experience).

For each short-duration activity students reported doing prior to the intervention, they reported 0.7 extra weekly revision hours after the intervention than before (significant at 5%). The same impacts were not seen for having had more prior experience of longer-form activities such as work experience. This finding supports the notion that students learn how to get value from different types of events – having done more short-duration employer engagement activities helps young people understand what to expect from such events and how to use them constructively. Moreover, it echoes the idea that school-leavers often need lots of exposures to different ideas, different employers and different possible futures before something resonates (Mann et al., 2017). Such diversity is easier from lots of small activities than a few large ones.

This same insight is reinforced in analysis of the relationship with academic attainment. Applying the same three-tier regression model elsewhere, we compare the effect size for the intervention between two subsamples: those who had previously participated in less than three short-duration activities, compared to three or more such experiences, being approximately the midpoint of the distribution (sample sizes 410 and 237 respectively). Those who had done more short activities in the past appeared to benefit more academically than those with fewer, with a particularly clear finding for English. For English, the effect size of the intervention, measured in proportions of a grade in outperformance version predicted grades, increases from -0.06 to 0.37 (and is then statistically significant at 5% level); maths from 0.00 to 0.01; and Science from -0.05 to 0.10. No such variation between the subsamples was observed for those who had previously done two or more long-duration activities vs fewer. Taken together, this suggests that – far from being in an environment of diminishing returns to scale – with each extra career talk or similar short-duration activity, there are accelerated effects on weekly revision hours and academic attainment.

Insights for future RCT design

The analysis in this small trial is sufficient to provide insights for designing future RCTs that might similarly seek to explore the impact of careers activity on KS4 attainment. The key statistical parameters of interest identified empirically in this trial are:

- ICCs on the delta between actual grade and predicted grade, as driven by the form group and intervention clustering, were 0.09 for English and Maths and 0.04 for Science.
- ICCs by form group and intervention clustering for actual grades ranged from 0.35 to 0.40 and for predicted grades from 0.33 to 0.46.
- The sample-based standard deviation estimate for the delta between actual and predicted grades was 1.2 for English, Maths and Science.
- The sample-based standard deviation estimate for the actual grades was 1.8-1.9 for English, Maths and Science; and around 1.6 for the predicted grades.

Other standard parameters can be taken as 80% for power and 0.10 for significance threshold; assuming an equal split between control and intervention groups and an average of 15 students in each lower cluster.

A cautious design with respect to effect size would focus just on planned revision hours as a channel for impact. This RCT suggested each 20-30 minute career talk could raise planned revision hours per week by about 30 minutes (via comparison to the control group); noting that the larger sample of analysis available via the follow-up survey identified a larger and statistically significant increase in planned revision hours after the intervention compared to the start of the year. In turn, each planned revision hour was worth around 0.03 of a grade in actual attainment in any of the three subjects examined, noting that a larger trial should be able to randomise sufficiently that it is possible to focus on actual grades rather than outperformance. Drawing on the approximately linear impact of career talks on long-term wage outcomes identified by Kashefpakdel and Percy (2017), this suggests a large programme of 10 career talks (or similarly scaled employer engagement career interventions) in Year 10 as well as 10 career talks in Year 11 could be sufficient to drive 10 extra weekly revision hours and 0.3 of a grade in average increased attainment. This suggests a total sample size of around 6000 students, with around 300 clusters each for the intervention group and the control group (ICC of 0.38).

A more aggressive design around effect size could focus on maintaining the same approximate trial scale and validating the point estimate identified for English outperformance, which incorporates potential routes for impact beyond the planned revision hours. Over three career talks, this outperformance was 0.09 of a grade. This suggests a total sample size of around 8,700 students and around 290 clusters in each of the intervention group and the control group (ICC of 0.07). This approach assumes there is something about the effect on English that was meaningfully different to Maths and Science, as opposed to the higher estimate for the effect on English being a function of random variation in the data. Were we instead to apply the average effect across English, Maths and Science of 0.04 and adopt a programme of 10 career talks instead of three (assuming the effect scales linearly), we would require a total sample size of around 4,000 students.

Future studies could also test other channels through which career talks and employer engagement affect academic outcomes that are theorised to be stronger than the impact of career talks a few months prior to exams. For instance, the potential of career talks, as part of a programme of high quality careers education, information, advice and guidance, is theorised to help students make subject choices that better suit their skills and future aspirations, so they are more motivated in class and perform better than they would have done on other subjects. A different pilot could be constructed to test this channel in particular, and other related ones, by tracking students for a longer period of time.

Discussion

This report presents the results from a clustered RCT involving 647 Year 11 students from five schools across England, conducted during the academic year 2017/2018. The trial explored the extent to which employer engagement activities (in this case, three individual employer career talks of about 20-30 minutes each) can impact young people's education outcomes, including attitudes towards school, confidence and academic attainment, as well as their future plans.

To explore changes between the control and intervention groups, the research team designed three surveys to be disseminated by schools at different stages of the trial: a baseline survey for all participants, a post-event follow-up survey just for the students in the intervention group and an end-of-year final survey for all participants. The results of students' Science, Maths and English GCSEs were also collected and compared against predicted grades to create a measure of "academic outperformance".

The power analysis conducted prior to the trial suggested that the probable sample size would only be able to confidently identify fairly large effect sizes, such as a quarter to a third of all students in a class outperforming their predicted grade by one grade. Nonetheless, as the first RCT of its type, there was significant value in proceeding: to elucidate the theory of change, to test a trial methodology that might be scaled up, to inform hypotheses for future testing, and to gather key statistical parameters that can be used to scope out the necessary sample size and funding for future work. Despite the sample size limitations, we have found evidence across large sections of the theory of change, pointing favourably towards the potential of such talks to support attainment and providing a template for future studies.

Students who participated in the three employer career talks described the talks as high quality – 65% were positive about volunteers' knowledge and information, compared to only 8% who were negative (n=294). Twice as many students felt the talks were a good use of their time than were critical, despite the charged atmosphere so close to such important exams. More importantly, students said the talks had helped them understand the link between education and work (83%), helped them believe in themselves and their capabilities (66%), and made them feel more motivated at school (74%). A significant group of people said it made them a lot more motivated for exams (22%) and had impacted their plans to revise (49%). By comparing differences in the final survey with the baseline survey, the intervention group results describe an 11 percentage point improvement in the proportion of students who "always try their hardest at school" compared to only a 1 percentage point improvement in the control group (n=297; statistically significant at the 15% level). Similarly, by the end of the year, both groups had become less critical about school, but with much sharper improvements in the intervention group: 64% of those who thought school was a waste of time had changed their mind by the end of the year, compared to only 48% for those in the control group (n=297, p-value 0.18).

These attitudinal shifts can also be traced through to student revision plans. Compared to the start of the academic year, students' plans for weekly revision hours had increased, on average, by 20% of the average – 2.7 extra hours per week in the lead up to exams, a statistically significant increase on a baseline mean of 13.7 hours (n=294). However, it is likely that student attitudes towards revision change during the year and as exams approach. We can explore this effect by analysing the responses to the end-of-year survey, adequately completed by 297 qualifying students from both the intervention and the control group. Asked in hindsight about their revision hours, an average difference of 1.5 hours per week can be seen between the intervention and the control group. This 1.5 hours is the equivalent of around 9% of the baseline survey average among the reduced sample for the final survey. Planned revision hours at the start of the year are also correlated to GCSE grades, with every 10 additional planned weekly revision hours typically worth around 0.3 of a grade in actual attainment (statistically significant at the 1% level). Having demonstrated statistically significant links between the career talks and increased motivation; increased valuing of education and revision plans; and significant links between revision plans and academic outcomes; the next question is to explore the direct relationship

between the employer career talks and academic outcomes.

On average across the three GCSE subjects involved, we identified a 0.04 of a grade in outperformance vs predictions controlling for gender and FSM status – the equivalent of one student in a class of 25 beating their predictions by one grade as a result of the career talks. While this result is not statistically significant, as expected given the small sample size and the power analysis conducted prior to the trial, confidence in the relationship is also built by the statistically significant effects observed along the underlying theory of change and its alignment with the existing research literature. Interestingly, we observed material differences between the three subjects – where the effect on English was more than double the average effect. It is unclear from this study whether this means it is easier for career talks, at such close proximity to exams, to drive improvement in English GCSE than other subjects, or whether it represents chance variation across a small sample. Insights from this small-scale study are sufficient to develop detailed hypotheses about the impact on attainment and design the sample size necessary to test them conclusively: depending on the hypotheses chosen this analysis suggests a necessary sample size of 4,000 to 9,000 students.

There are important signs of differences between the five schools taking part, reinforcing evidence that how employer engagement activities are designed and carried out is important (Rehill, Mann and Kashefpakdel, 2017). For instance, the proportion of students that said they had been prepared for the talks ranged from 9% to 44% across the five schools. In only one of the schools was there a statistically significant relationship between the intervention and academic attainment and it was a school whose students had more prior experience of employer engagement activities and described the volunteers' knowledge and information as higher quality. In this school, average outperformance was between 0.6 and 0.7 of a grade across the three subjects (significant at either the 1% or the 5% level depending on the subject).

The importance of motivation is also reinforced as part of the theory of change: Students who reported an increase in motivation as a result of the career talks saw higher academic outperformance vs the control group, relative to the average outperformance described above (0.14 of a grade effect size from the intervention for English, 0.05 for maths, 0.05 for Science; sample size 557). Being prepared for talks also enabled students to gain more benefit from them with respect to education pathway planning. The difference between being prepared and not being prepared is the equivalent of one in four more students getting significant value from the talks. Both intervention and control group students were more cautious by the end of the year about whether or not there might be a particular career out there that would suit them, but with only a 1 percentage point decline in the intervention group compared to 6 percentage points in the control group.

This study reinforces other aspects of the longer-term theory of change. It shows the potential of employer career talks to shape education and career pathways, linking to the long-term impact on wages that has been demonstrated via analysis on the British Cohort Study. 41% of students said that the three talks had played a role in reflecting on their education pathway choices after finishing school aged 17 or 18 and on their career choices, the jobs they aspire to one day. While these are major life decisions that we would not expect young people to change lightly, it is noteworthy that a total of 7% (20 people) said the talks had made them change their choices in either career or education pathway.

There is also tentative evidence that the talks have more impact on lower attaining students and those who are disengaged at school. For instance, those predicted high passes in English (grades 6-9; n=146) described an increase in revision hours of 1.8 hours per week or a 10% increase on the average amount they had planned during the start-of-year survey, whereas those predicted narrow passing grades (grades 4-5; n=129) described an increase of 3.2 hours, a 32% increase on baseline plans. Given the persistence of the attainment gap between disadvantaged pupils and all others (EEF, 2018) and the importance of academic attainment for future outcomes (DfE, 2014), these findings point to important hypotheses to explore in future trials, with larger sample sizes that permit high-quality subsample analysis.

In conclusion, this small-scale RCT has worked well as a pilot, demonstrating a successful implementation of recruiting schools and delivering careers interventions in a randomised format in an English secondary school setting, conducting appropriate statistical analysis, and identifying a number of key RCT parameters to enable the design of future larger-scale research. A number of hypotheses are suggested for where this impact might be strongest, which could then be tested explicitly in a larger-scale future RCT and/or explored qualitatively with students and teachers. Indicative evidence is highly supportive that such talks have ancillary benefits for academic attainment, noting that their primary benefit is for career and education pathway choices and broader life motivation.

Employer career talks can help increase young people's belief that school is worthwhile and important to achieve longer-term career goals, motivating them to work harder and put in more hours of revision, particularly among lower attaining students or those from more disadvantaged backgrounds. Indeed, the evidence points towards increasing returns to scale – students who had done more short-duration employer engagement prior to the study gained saw more academic benefits from the three career talks than those with less. This fits in with previous research, which has shown the economic benefits of career talks can continue up to 30 or 40 career talks in a year, and potentially beyond (Kashefpakdel and Percy, 2017). This points to a simple conclusion: if you want a bigger impact, simply add more talks. *More is more!*

Limitations and further research

There is a concern among some social science researchers that too much trust has been put in RCTs over other methods of investigation. Critics of RCTs argue that randomization does not equalize anything other than the treatment in the treatment and control groups, yielding at best an unbiased estimated but only one that applies within very specific contexts and of potentially limited practical value.

From our perspective, RCTs can play a role in building knowledge but they can only do so as part of a cumulative program, combining with other methods, including conceptual and theoretical – hence the focus on this report on the theory of change and wider literature. Over the last decade, the research team at Education and Employers have provided evidence using other methods the result of which compliments the indicative findings of this report (Hughes et al. 2016, Mann et al. 2017 and Kashefpakdel et. al 2017)

As an example, in 2017, in a project funded by Barclays LifeSkills, the research team at Education and Employers used a YouGov survey of 824 secondary school teachers to ask what happens to young people's academic achievement after taking part in activities with local employers. Nine out of 10 secondary school teachers (93%) said that work experience and employer related activities can help students to do better in exams. Teachers also said that one in five pupils in a typical year group have positively benefitted from these activities in school in terms of their academic attainment.

Secondly, it is important to highlight that this research has adopted a pilot approach. Pilot RCTs are often useful to undertake before embarking on a larger, primary trial. A pilot study like this is not intended to be the final word on answering a particular question, instead it should be seen as part of a collective, community-wide effort to build research and understanding around a particular topic, and in contributing to the design of future trials.

Small pilot trials (as small as 30 individuals, Togerson and Togerson, 2008) nonetheless can stand alone and provide insights on the size of the main trial, its likely costs and key hypotheses. In this study, the size of the budget and time availability allowed us to target a sample size of around 600-800. However, the drop-out rate in the final, post-GCSE survey was not anticipated and future trials would need to take a different approach, particularly on engaging post-GCSE insights from students who do not return to the school after GCSEs. The drop-out rate occurred in both treatment and control and the attrition is not treatment-related (i.e. being to do with contact difficulties rather than intentional withdrawals), which enables analysis to take place, but represents nonetheless an important caveat on the potential to extrapolate the findings to other cohorts.

There is a need to test and replicate the findings of this study with larger trial. Overall, there is evidence that career education can have positive impact on academic attainment as seen in the wider literature but more needs to be done to quantify, contextualise and shed light on this link.

References

AIR UK. (2008). *The involvement of Business in Education: A rapid evidence assessment of measurable impacts.* Department for Children, Schools and Families.

Aronson, J., & Inzlicht, M. (2004). The ups and downs of attributional ambiguity: stereotype vulnerability and the academic self-knowledge of African American college students. *Psychological Science*, 15(12), 829–836.

Blicblau, A., Nelson, S., Louise, T. & Kurosh, D. (2016). The role of work placement in engineering students' academic performance. *Asia-Pacific Journal of Cooperative Education,* 17(1), 31-43.

Borghans, L., & Golsteyn, H. H. (2006). Time discounting and the body mass index: Evidence from the Netherlands. *Economics and Human Biology*, 4, 39-61.

CBI. (2007). *Time well spent: Embedding employability in work experience.* Retrieved from https://www.educationandemployers.org/wp-content/uploads/2014/06/time-well-spent-cbi.pdf

Ceschin, F., Rakowski, R., & Ver, I. (2017). The influence of work placement on the academic achievement of undergraduate design students. *The Design Journal*, 20(2), 259-278.

Chambers, N., J. Rehill, E.T. Kashefpakdel and C. Percy. (2018). *Drawing the Future*. London: Education and Employers.

DCSF. (2009). *The Apprenticeships, Skills, Children and Learning Act*. London, retrieved from: http://www.legislation.gov.uk/ukpga/2009/22/pdfs/ukpga_20090022_en.pdf

DfE. (2014). *Students' educational and developmental outcomes at age 16*. London: Department for Education.

DfE. (2017). *Careers Strategy: Making the Most of Everyone's Skills and Talents*. London: Department for Education.

DfES. (2005). *14–19 Education and Skills: Implementation Plan*. London: Department for Education and Skills.

Eddy Adams Consultants. (2008). *Work Experience in Scotland*. The Scottish Government.

EEF. (2018). *The Attainment Gap.* London: Education Endowment Foundation.

Golden, S., O'Donnell, L., Benton, T., Benton, B., & Rudd, P. (2005). *Evaluation of increased flexibility for 14 to 16 year olds programme: Outcomes for the First Cohort.* London: Department for Education and Skills.

Golden, S., O'Donnell, L., Benton, T. & Rudd, P. (2006). *Evaluation of Increased Flexibility for 14 to 16 year olds Programme: Delivery for cohorts 3 and 4 and the future.* London: Department for Education and Skills.

Golden, S., O'Donnell, L. & Benton, T. (2010*). Evaluation of the Young Apprenticeships Programme Outcomes for Cohort 3.* Coventry: Young People's Learning Agency.

Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology*, 78, 1360-1380.

Harrison, N., James, D. & Last, K. (2012). *Building a culture of achievement: The impact of the pursuit of CoPE (the Certificate of Personal Effectiveness) on GCSE attainment and engagement in learning*. Bristol: University of the West of England.

Hillage, J., Kodz, J., & Pike, G. (2001). *Pre-16 Work Experience Practice in England: An Evaluation.* Department for Education and Employment.

Hooley, T., Matheson, J. & Watts, A.G. (2014). *Advancing Ambitions: The Role of Career Guidance in Supporting Social Mobility.* London: Sutton Trust.

Huddleston, P., Mann, A. & Dawkins, J. (2014). That aroma of where they are likely to go: Employer engagement in high performing English independent schools. In A. Mann, J. Stanley & L. Archer (Eds.), *Understanding employer engagement in education: Theories and research* (pp. 163-175). London: Routledge.

Hughes, D., Mann. A., Barnes, S-A., Baldauf, B., & McKeown, R. (2016) *Careers education: International literature review.* London: Education Endowment Foundation and Bank of America Merrill Lynch.

Jones, S., Mann, A. & Morris, K. (2016). The 'employer engagement cycle' in secondary education: Analysing the testimonies of young British adults. *Journal of Education and Work*, *29*(7), 834-856.

Kashefpakdel, E. & Schleicher, M. (2016). *The impact of career development activities on student attitudes towards school utility: An analysis of data from the Organisation for Economic Co-operation and Development's Programme for International Student Assessment (PISA).* London: Education and Employers.

Kashefpakdel, E. & Rehill, J. (2017). *Making the Grade.* London: Education and Employers.

Kashefpakdel, E. & Percy, C. (2017). Career education that works: An economic analysis using the British Cohort Study, *Journal of Education and Work,* 30(3), 217–234.

Kashefpakdel, E., Rehill, J., & Schleicher, M. (2018). What impact can employer engagement have on student attitudes towards school and their academic achievement? An analysis of OECD PISA data. In A. Mann, P. Huddleston & E. Kashefpakdel (Eds.), *Essays on Employer Engagement*. Abdingdon: Routledge.

Kemple, J. & Willner, C. J. (2008). *Career Academies – Long-term impacts on labor market outcomes, educational attainment, and transitions to adulthood.* New York: MDRC.

Killeen, J., Sammons, S. & Watts, A. G. (1999) *The effects of careers education and guidance on attainment and associated behaviour.* Cambridge: NICEC/University of Hertfordshire/ ULIE.

Lapan, Gysbers & Petroski (2001). Helping seventh graders be safe and successful: A statewide study of the impact of comprehensive guidance and counselling programmes. *Journal of Counselling & Development 79*(3), 320-330.

Lee, J. S. (2014). The relationship between student engagement and academic performance: Is it a myth or reality*?, The Journal of Educational Research*, *107*(3), 177-185.

Lynch, S., McCrone, T., Wade, P., Fatherstone, G., Evans, K. & Golden, S. (2010). *National evaluation of diplomas: The first year of discover*. London: Department for Children, Schools and Families.

Mann, A., Spring, C., Evans, D. & Dawkins, J. (2011). *The importance of experience of the world of work in admissions to Russell group universities: A desktop review of admissions criteria for six courses.* London: Education and Employers.

Mann, A., Huddleston, P. & Dawkins, J. (2012). *Employer Engagement in English Independent Schools*. London: Education and Employers.

Mann, A. & Dawkins, J. (2014). *Employer engagement in education: Literature review.* London: Education and Employers.

Mann, A. & Kashefpakdel, E. (2014). The views of young Britons (aged 19-24) on their teenage experiences of school-mediated employer engagement. In A. Mann, J. Stanley & L. Archer (Eds.), *Understanding Employer Engagement in Education: Theories and Research.* Abingdon: Routledge.

Mann, A. & Percy, P. (2014). Employer engagement in British secondary education: wage earning outcomes experienced by young adults. *Journal of Education and Work,* 27:5, 496-523.

Mann, A & Huddleston, P. (2015). *How should our schools respond to the changing demands of the twenty first century labour market? Eight perspectives.* London: Education and Employers Research

Mann, A. Dawkins, J. & McKeown, R. (2017). *Towards an employer engagement toolkit: British teachers' perspectives on the comparative efficacy of work-related learning activities.* London: Education and Employers.

Mann, A., Kashefpakdel, E.T., Rehill, J., and Huddleston, P. (2017). *Contemporary transitions: Young Britons Reflect On Life After Secondary School And College*. London: Education and Employers.

Mann, A., Rehill, J. & Kashefpakdel, E.T. (2018). *Employer engagement in education: Insights from international evidence for effective practice and future research*. London: Education Endowment Foundation and Education and Employers.

Miller, A. (1998). *Business and Community Mentoring in Schools: Research Brief No. 43*. London: Department for Education and Employment.

Mourshed, M., Krawitz, M. & Dorn, E. (2018). *How to improve student educational outcomes: New insights from data analytics.* London: McKinsey & Company.

Musset, P. & Kurekova, L. (2018). "Working it out: Career Guidance and Employer Engagement", *OECD Education Working Papers, No. 175*. Paris: OECD Publishing.

National Support Group for Work Experience. (2008) *Students' perceptions of work experience by the National Support Group for Work Experience: Report of impact measures*. Retrieved from https://www.educationandemployers.org/wp-content/uploads/2014/06/student-perceptions-of-work-experience-iebedcsf.pdf

O'Donnell, L., Golden, S., McCrone, T., Rudd, P. & Walker, M. (2006). *Evaluation of increased flexibility for 14–16 year olds programme: Delivery for cohorts 3 and 4 and the future.* London: Department for Education and Skills.

Ofsted. (2004). *Increased flexibility programme at key stage 4: First year evaluation.* London: Office for Standards in Education.

Orthner, D. K., Akos, P., Rose, R., Jones-Sanpei, H., Mercado, M., & Woolley, M. (2010). CareerStart: A middle school student engagement and academic achievement program. *Children and Schools*, *32*, 223– 234.

Osborne, K. (2007). *The impact of on-line revision on GCSE Results.* Education-line. Retrieved from: http://www.leeds.ac.uk/educol/documents/165930.htm

Percy, C. and Mann, A. 2014. School-mediated employer engagement and labour market outcomes for young adults Wage premia, NEET outcomes and career confidence. In Mann, A., Stanley, J. and Archer, L. (Eds.). *Understanding Employer Engagement in Education*. London & New York: Routledge, pp.205-220.

Percy, C. & Kashefpakdel, E. (2018). Insiders or outsiders, who do you trust? Engaging employers in school-based career activities. In A. Mann P. Huddleston & E. Kashefpakdel (Eds.), *Essays on employer engagement*. Abdingdon: Routledge.

Percy, C. & Kashefpakdel, E. (2019). Social advantage, access to employers and the role of schools in modern British education. In T. Hooley, R. Sultana & R. Thomsen (Eds.), *Career guidance for emancipation*. London: Routledge.

Person, A., & Rosenbaum, J. (2006). Educational outcomes of labor-market linking and job placement for students at public and private 2-year colleges, *Economics of Education Review*, 25(4), 412-429

Plank, S. (2001). A question of balance: CTE, academic courses high school persistence, and student achievement. *Journal of Vocational Education Research,* 26(3), 279-327.

Pocklington, K. (1996). The evaluator's view. In K. Myers, (Ed.), *School improvement in practice: Schools make a difference project*. London: Falmer Press.

QCA (2004) *Work-related learning for all at Key Stage 4: Guidance for implementing the statutory requirement from 2004*. London: Qualifications Curriculum Authority.

Raffo, C. & Reeves, M. (2000) Youth transitions and social exclusion: Developments in social capital theory. *Journal of Youth Studies*, 3(2), 147–166.

Rehill, J. (2016). *The importance of experience of the world of work in admissions to health-based undergraduate courses at Russell group universities: A desktop review.* London: Education and Employers.

Rehill, J., Mann, A. & Kashefpakdel, E. (2017). *What works in Careers Events.* London: The Careers and Enterprise Company.

Sharpe, R., Abrahams, I., & Fotou, N. (2018) Does paired mentoring work? A study of the effectiveness and affective value of academically asymmetrical peer mentoring in supporting disadvantaged students in school science. *Research in Science & Technological Education*, 36(2), 205-225.

Stanley, J. & Mann, A. (2014). A theoretical framework for employer engagement. In A. Mann, J. Stanley and L. Archer (Eds.), *Understanding employer engagement in education: Theories and research*. London: Routledge.

Stoet, G. & Geary, D. (2012). Can stereotype threat explain the gender gap in mathematics performance and achievement?. *Review of General Psychology*. 16, 93-102.

The Careers and Enterprise Company. (2018). *Closing the gap: The level of employer engagement in England's schools and colleges.* London: The Careers and Enterprise Company.

Tower Hamlets Study Support Project. (1997). *Closing the gap: Tower Hamlets' study support project, June 1997*. London: Tower Hamlets Study Support Project.

Annex 1

Survey 1: Baseline survey

1. What is your name?

……

2. What is the name of your school?

……

Education and schooling

3. What are your predicted GCSE grades? (please tick)

	9	8	7	6	5	4	3	2	1
English									
Science									
Maths									

4. How many times have you taken part in activities with employers which last MORE than a day? (e.g. Mentoring, job shadowing, work experience)

☐ Never ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10+

5. How many times have you taken part in activities with employers which last LESS than a day? (e.g. Career talks, careers fairs, workplace visits, speed networking/careers carousels)

☐ Never ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10+

6. Thinking about everything that you have learnt at school during year 10 and Year 11, how relevant do you find what you have learnt in school to your plans for future work and study?

☐ Highly relevant ☐ Usually relevant ☐ Occasionally relevant ☐ Not at all relevant

7. How confident are you that what you will do between 16 – 18 will help your future career?

☐ Very confident ☐ Quite confident ☐ Quite unconfident ☐ Not at all confident

8. How many hours per week do you think you will revise in the month before your first GCSE exam? (write in hours)

……

Attitudes towards education

9. How far do you agree with the following statements?

	Strongly disagree	Disagree	Agree	Strongly agree
I always try my hardest at **everything** that I do at school				
When I start a new piece of work I usually feel confident that I will be able to complete it successfully				
I don't give up easily – even when I find a task difficult				
I think school is a waste of time				
I always look out for opportunities to learn more about my future				

Aspiration

10. Is there a particular career which you would like to do when you leave education?

If you have more than one job in mind, please write the one you are most serious about pursuing

☐ Yes ☐ No ☐ Unsure

10a. How certain are you that this is the job you would ultimately like to pursue?

☐ Very certain ☐ Quite certain ☐ Quite uncertain ☐ Very uncertain

10b. Do you think you have had enough information to make this choice?

☐ Yes ☐ No ☐ Unsure

10c. How confident are you that you can achieve the job you mentioned above?

☐ Very confident ☐ Quite confident ☐ Quite unconfident ☐ Not at all confident

11. How confident are you that there is a job out there for someone with your skills and interests?

☐ Very confident ☐ Quite confident ☐ Quite unconfident ☐ Not at all confident

12. When I finish school or college at 18, I would like to…

☐ Stay in college

☐ Start an apprenticeship

☐ Go to university

☐ Other

☐ Embark on any other training course

☐ Don't know

☐ Start working

Perceptions of employer engagement

13. How far do you agree with the following statements? Career talks with local business people/volunteers…

	Strongly disagree	Disagree	Agree	Strongly agree
…could motivate me to take school more seriously				
…could help me realise the relevance of what I do in school to my future				

Tell us about yourself…

Are you?

☐ Male ☐ Female ☐ Prefer not to say

How would you describe your ethnic group?

☐ White (British, Irish, other White background)

☐ Mixed (White and Black Caribbean, White and Black African, White and Asian, Other Mixed Background

☐ Asian or Asian British

☐ Black or Black British

☐ Chinese or other ethnic group

☐ Other

☐ Prefer not to say

Are you, or have you ever been, entitled to free school meals?

☐ Yes ☐ No ☐ Don't know ☐ I would prefer not to answer this question

Did either your father or mother attend university?

☐ Yes ☐ No ☐ Don't know ☐ I would prefer not to answer this question

Survey 2: Post-event survey

1. What is your name?
……
……

2. What is the name of your school?
……
……

Preparation

When answering these questions please think about the THREE career talks that you have received over the last month or so

3. Did your teachers prepare you for the talks before they took place? (e.g. did they help you consider any questions to have in mind before they came in, did they discuss the potential value of the talk etc.)

☐ Yes ☐ No ☐ Unsure

Event feedback

4. How do you rate the quality of the career talks you received, in terms of… (1 = very low quality; 2 = low quality; 3 = no clear view on high or low quality; 4 = high quality; 5 = very high quality)

	1	2	3	4	5
Learning something new and useful					
Volunteers' knowledge and information					
Interaction and engagement					
Use of time					

5. Has what you've heard during these talks informed your… (please tick)

	Yes, it has reinforced my choices	Yes, it has made me question my choices	Yes, it has changed my choices	No, it has not impacted on my choices
…education choices (e.g. what you want to do after you finish school at 17/18)				
…career choices (e.g. the job(s) you aspire to have one day)				

6. To what extent did the career talks help you with…

	A lot	A little	They didn't help me at all	Unsure
understanding the link between what I am doing now in school to my future				
getting motivated to study harder for my exams				
thinking positively towards school				
believing in myself and my capabilities				

7. Has what you have heard impacted on the number of hours you plan on revising?

☐ A lot ☐ A little ☐ No ☐ Unsure

8. How many hours per week do you think you will revise in the month before your first GCSE exam? (write in hours)

……
……

Survey 3: Final survey

1. What is your exam number?

……

What is the name of your school?

……

Education and schooling

How many times have you taken part in activities with employers which last LESS than a day? (e.g. Career talks, careers fairs, workplace visits, speed networking/careers carousels)

☐ Never ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10+

How many times have you taken part in activities with employers which last MORE than a day? (e.g. mentoring, job shadowing, work experience)

☐ Never ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10+

Thinking about everything that you have learnt at school during Year 10 and Year 11, how relevant do you find what you have learnt in school to your plans for future work and study?

☐ Highly relevant ☐ Usually relevant ☐ Occasionally relevant ☐ Not at all relevant

How confident are you that what you will do between 16 – 18 will help your future career?

☐ Very confident ☐ Quite confident ☐ Quite unconfident ☐ Not at all confident

Roughly how many hours did you revise in the WEEK BEFORE your first GCSE exam? (write in hours; if unsure please provide your best estimate)

……
……

Attitudes towards education

How far do you agree with the following statements?

	Strongly disagree	Disagree	Agree	Strongly agree
I always try my hardest at everything that I do at school				
When I start a new piece of work I usually feel confident that I will be able to complete it successfully				
I don't give up easily – even when I find a task difficult				
I think school is a waste of time				
I always look out for opportunities to learn more about my future				

Aspiration

Is there a particular career which you would like to do when you leave education?

If you have more than one job in mind, please think about the one you are most serious about pursuing

☐ Yes ☐ No ☐ Unsure

Skip to question 8c if you have ticked 'No' or 'Unsure'

8a. How certain are you that this is the job you would ultimately like to pursue?

☐ Very certain ☐ Quite certain ☐ Quite uncertain ☐ Very uncertain

8b. How confident are you that you can achieve the job you mentioned above?

☐ Very confident ☐ Quite confident ☐ Quite unconfident ☐ Not at all confident

8c. Do you think you have had enough information and experiences to make this choice?

☐ Yes ☐ No ☐ Unsure

How confident are you that there is a job out there for someone with your skills and interests?

☐ Very confident ☐ Quite confident ☐ Quite unconfident ☐ Not at all confident

When I finish school or college at 18, I would like to…

☐ Stay in college

☐ Start or continue with an apprenticeship

☐ Go to university

☐ Don't know

☐ Start working

☐ Embark on any other training course

☐ Other _____

Annex 2: Drop-out analysis

The final end-of-year survey was only completed by around half the baseline survey students with exam data that passed a quality check. While this generates a sufficient sample size for indicative analysis, it is important to understand any distortions in the sample population potentially generated by this reduction in sample size. The tables below describe example key features of the students across the groups:

	Not in Final Survey		In Final Survey		Overall
Values	Control Group	Intervention	Control Group	Intervention	
Average planned revision hours in week before GCSEs (capped at 75)	12.9	9.9	16.6	19.1	14.3
% FSM	7%	13%	16%	12%	12%
% Male	41%	51%	23%	24%	35%
Average number of short duration employer activities previously experienced	2.3	1.8	3.4	2.5	2.5
Average number of long duration employer activities previously experienced	2.1	1.7	1.5	1.6	1.7
Average Predicted English Grade	6.2	5.1	6.6	6.5	6.1
Average Predicted Science Grade	6.2	4.9	6.6	6.6	6.1
Average Predicted Maths Grade	6.3	5.2	6.6	6.5	6.1
Total students in category	183	167	157	140	647

	Not in Final Survey		In Final Survey		Overall
Response to "I always try my hardest at everything I do at school"	Control Group	Intervention	Control Group	Control Group	
Strongly agree	13%	9%	19%	22%	15%
Agree	70%	67%	70%	59%	67%
Disagree	0%	0%	0%	1%	0%
Strongly disagree	15%	21%	10%	18%	16%
Total	100%	100%	100%	100%	100%

	Not in Final Survey		In Final Survey		Overall
School	Control Group	Intervention	Control Group	Control Group	
School 1	2	1	54	28	85
School 2	1		66	73	140
School 3	32	15	24	26	97
School 4	93	87			180
School 5	55	64	13	13	145

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