TASO Transforming Access and Student Outcomes in Higher Education

Efficacy Pilot Evaluation Report

London School of Economics' Disabled Students Career Appointments

October 2023

1. Summary

Project Team

The team comprised colleagues from the University of Cambridge, LSE and TASO.

Project description

In September 2022, TASO commissioned the University of Cambridge to work with two higher education providers, LSE and UCLan, to support evaluations of interventions designed to support disabled students. The aim of this project was to build Type 2 evidence on the interventions and to scope the feasibility of Type 3 evaluation.[1] This report presents the findings from the evaluation conducted with the LSE.

Intervention being evaluated

The London School of Economics (LSE)'s Career Services offer, as one element of wider provision, bespoke career support to disabled students. These bespoke, individual, career appointments look to support disabled students' transition into employment in a way that develops their understanding of their strengths and the range of support and accommodations that they may want to seek from potential employers beyond graduation.

The disabled students' career appointments are tailored to each individual and do not follow a pre-set format, instead responding to the needs of each disabled student. There is no cap on the number of these appointments disabled students may access and prior evidence generated by LSE suggests that this approach results in disabled students feeling more confident about asking for reasonable adjustments, better equipped to identify pro-diversity employers, and generally more empowered about their disability.

Methodology

The aim of the present efficacy pilot was to explore how the disabled students' career appointments may contribute to employment related outcomes upon graduation from LSE. The pilot also aimed to understand how other evidence generation approaches may be deployed to improve the causal inference around the impact of the intervention.

A two-component evaluation design was implemented: an impact evaluation taking a broadly quasi-experimental approach using Propensity Score Matching to generate

[1] The types of evidence are based on the Office for Students Standards of Evidence found at: https://www.officeforstudents.org.uk/publications/standards-of-evidence-and-evaluating-impact-of-outreach/. Type 2 evidence means there is data which suggests that an activity is associated with better outcomes for students (i.e., correlational evidence). Type 3 evidence uses a method which demonstrates that an activity has a 'causal impact' on outcomes for students.

relevant comparison groups for the outcomes of disabled students engaging with the bespoke career appointments (specifically for undergraduate students); and a process evaluation looking to explore experiences and perceptions of impact from the appointments, using a survey collecting qualitative data asynchronously and allowing for a variety of modes of response (from text to image to audio input).

Key findings

The process evaluation saw a small number of individuals provide predominantly text-based input to the qualitative prompts and offered evidence in support of most of the ways in which the career appointments were expected to work. Disabled students welcomed and saw the bespoke career appointments as useful. There was evidence that the career appointments could lead to the desired changes around increased understanding and acceptance of students' own disability, including gaining confidence to disclose their disability and advocate for themselves, and increased confidence to request adjustments. Respondents also offered evidence that the appointments supported them in navigating job applications, applying for more jobs than they would have otherwise, being better prepared for recruitment processes, and generally improving their self-belief.

The impact evaluation explored employment-related outcomes, including employment, earnings, and general job satisfaction. Due to small sample sizes, the analysis was not able to identify any statistically significant effects of the bespoke career appointments on the above outcomes. Compounded by the limitation that propensity score matching approach cannot fully account for self-selection bias, and the distal nature of the outcomes being considered, the pilot therefore offers important lessons for future evaluations of intensive, tailored, and potentially small-scale disability support interventions.

Key conclusions

These lessons point towards evaluation approaches specifically designed for small samples being of likely higher relevance to this type of intervention. This may include theory-based approaches, contribution analysis, process tracing, or large-scale, deeper, and potentially mixed-methods process evaluation that explores every mechanism in the intervention's theory of change with a diverse range of students, including those who choose not to engage with the offer.

If deployed, quantitative, impact-focused approaches would benefit primarily from a consideration of the proximity of the outcomes being captured to the intervention being evaluated: here, the ultimate employment outcomes are highly relevant to the intervention, but intermediate outcomes around self-belief, self-advocacy, knowledge of disability adjustments and employment-seeking practices may be more relevant. A

range of quasi-experimental impact evaluation approaches may also consider historical data and capitalise on already deep and sustained understanding of and engagement with relevant data, especially from administrative sources, within LSE.

1. Introduction

1.1. Background and rationale for intervention

The London School of Economics (LSE)'s Career Services provides a range of mechanisms of support to disabled students. A key element of this is bespoke career support for disabled students, with a view to supporting their transition into employment in a way that develops disabled students' understandings of their strengths and the range of support and accommodations that they may want to seek from potential employers beyond graduation. This bespoke career support takes the form of career appointments with specialist career consultants who have expertise in disability and employment for disabled students. Many of the career appointments are run by one single member of the Service, who also set up the offer in the first place, after realising that there needed to be both a formal process in place whereby disabled students could access specialist support and greater awareness and understanding of disability among the career consultants offering appointments to students. The beneficiaries of the programme are disabled students (whether they officially disclose a disability or not) who request at least one disabled students' career appointment.

The number of disability appointments across all undergraduate and graduate years that disabled students can access is not capped (unlike regular appointments) and they are specifically tailored to the needs of each individual student, without a pre-set structure or pre-set approach, and instead responding to the needs of the individual. These are therefore bespoke in nature.

Promising evidence from a small-scale evaluation exercise conducted by LSE in the summer of 2022 informed this efficacy pilot of the Career Services' disabled students' career appointments. LSE's evaluation was linked to the development of the Access and Participation Plan (APP) and sought to understand the impact of a wide range of 'diversity interventions'. The approach used by LSE was mostly qualitative, including engaging directly with beneficiaries. This analysis suggested that because of their engagement with the Career Services offer, disabled students felt more confident about asking for reasonable adjustments (in relation to their disability); they were better equipped to identify employers who were pro-diversity or were more likely to offer appropriate adjustments; and felt overall more empowered about their disability. There are further written testimonials from beneficiaries, who account for their experiences during and after their specific career appointments; and feedback from graduates (sometimes when they attend graduate appointments) about their experiences in the labour market, but these are not always systematically collected to avoid burden on beneficiaries.

1.2. Intervention aims and objectives

This bespoke offer to disabled students at LSE falls within a wider set of activities and interventions by a range of higher education providers (HEPs) in support of disabled students. Their broad aims are to offer a level of support commensurate with the needs of the disabled students, where this is possible, with a view to equalising the disabled students' opportunities to achieve to the best of their potential during their higher education studies.

The specific aims of the LSE disabled students' career appointments are to equip disabled students who engage with the offer with better access to high-skill employment, that is, employment commensurate with their education and training and the degree they are completing. Overall, the intervention aims to increase the levels of employability of disabled students. This includes aspects of actual employment, that is, the intervention seeks to increase disabled students' chances of employment post-graduation. But it seeks to achieve this while also improving the employment-related experiences disabled students have, particularly in relation to legally-mandated appropriate adjustments for students' respective disabilities, therefore also improving disabled students' satisfaction with their job (once in employment).

The disabled students' career appointments look to achieve these impacts by equipping students with increased confidence in navigating the employment process, including asking for reasonable adjustment, knowledge of which employers take a distinctively pro-diversity approach or are consistent in their offer of reasonable adjustments, and a reduced sense of stigma around disability, theirs and in general.

1.3. Intervention approach

The Careers Services disabled students' appointments offer disabled students the opportunity to discuss a range of employment and disability related topics with an experienced careers consultant.

These appointments are specifically aimed at disabled students and advertised as such, including on a web page that has been available since 2017 outlining the range of support provided by the main dedicated career consultant[2]. Additionally, students who have not formally disclosed a disability may still request them, indicating to the Careers Service that they would like disability-specific support. This means that it would be

[2] https://blogs.lse.ac.uk/careers/2017/09/13/lse-careers-services-and-support-for-disabled-students-3/

reasonable to assume that any LSE student may be aware of the availability of the bespoke career appointments.

The appointments do not have a prescribed structure or any pre-specified goals, rather they are guided by the needs of each individual beneficiary engaging with the appointment.

Appointments are available for both undergraduate and graduate students, and each may take a slightly different form given the different stages of student's study and any previous employment histories.

At the start of each appointment, the student is asked about what they would like to discuss; or if this is not an appropriate strategy, they are provided with a general overview of what the appointment can cover, so that a topic and goal can be agreed. Topics for discussion may include, but are not limited to, career planning, engaging with employers, disability adjustments, practical job search insights, and many others.

Each appointment lasts for up to 45 minutes, and the number of appointments that each disabled student may request is uncapped (unlike career appointments for non-disabled students, which are capped), however the Careers Services do look into the reasonable use of their offer. The full theory of change is included in Annex A.

1.4. Evaluation approach

The aim of this efficacy pilot was to explore how the disabled students' career appointments may contribute to employment related outcomes upon graduation from LSE. A further aim of the study was to understand how other evidence generation approaches may be deployed to improve the causal inference around the impact of the intervention.

Given these aims and the nature of efficacy evaluations looking at the intervention as delivered by the original team designing it (specifically the LSE career consultants) and delivering it as they originally intended, this efficacy pilot consisted of two components:

- Component one: an impact evaluation piece taking a quasi-experimental approach using Propensity Score Matching (PSM) to generate a comparison group against which the outcomes of disabled students engaging with the targeted career appointments may be compared; and
- Component two: A process evaluation looking to explore experiences in and around the career appointments and perceived impact by those engaging with them by means of a survey deploying an asynchronous qualitative data collection tool prompting respondents with a set of questions and allowing a range of response options (from text to audio to image).

While the disabled students' career appointments are available for both undergraduate and graduate students, this efficacy pilot focused on undergraduate students only. The reasons for this included: the longer duration of undergraduate degrees which allows, in principle, for more than one disabled students' career appointment to be had; the diverse and international backgrounds of the postgraduate population at LSE making comparisons in terms of employment far more difficult than for undergraduates since a lot of postgraduate study destinations are international; and the consistency of the data collected for undergraduate students.

2. Methodology

2.1. Research questions and hypotheses

Drawing on the Theory of Change mentioned above, and in further consultation with the delivery team, two working hypotheses about the impact, and experience, of the disabled students' career appointments were developed.

These working hypotheses guided the full efficacy pilot and each of the two components outlined above and were as follows:

Working hypothesis A:

Students who engage with the dedicated disabled students' career appointments have better employment outcomes soon after their degree *compared to similar students who did not engage with these appointments*. This working hypothesis guides the impact component of the evaluation. These better employment outcomes include:

- higher likelihood of being in employment;
- higher likelihood of being in high-skill employment (particular occupational categories);
- higher likelihood of expressing satisfaction with the employment that has been secured.

Working hypothesis B:

Students who engage with the dedicated disabled students' career appointments are able to better articulate their understanding of their own disability and appropriate adjustments required (from employers) in response to their disability and feel empowered to discuss and act upon requirements. This working hypothesis guides the process evaluation.

An impact evaluation and a process evaluation were undertaken simultaneously, with results integrated in the final report, alongside a consideration of the methodological approaches which may allow for the strengthening of the causal inference possible in relation to the impact piece.

2.2. Impact evaluation design

To address working hypothesis A above and understand the impact of the disabled students' career appointments, a quantitative quasi-experimental design was used in this efficacy pilot.

This used data at the individual level, taking in information from existing 'monitoring' data (record of attendance in career appointments), student record data (in terms of their background characteristics), and the Graduate Outcomes survey[3] in terms of three specific employment outcomes, including employment status, wage and affective outcome. The hypothesised effect around a higher likelihood of high-skilled employment was not operationalised, as per protocol, because at design stage it was deemed that the sample sizes would be insufficient to carry out this type of analysis.

Estimating the causal effect of attending the disabled students' career appointments programme raises the missing counterfactual problem. The effect (not necessarily causal) of attending the career appointments can be estimated using both OLS regression, with and without controlling for a rich set of background characteristics (as a robustness check), and with a matching method (propensity score matching) to better take into account unobserved heterogeneity associated with programme participation.

The major challenge for such simple regression analyses is that of establishing causal connections between programme participation and disabled students' outcomes, given that the students who participated in the programme have unobserved characteristics that also affect their outcomes. Because students self-select into the programme there is very limited quasi-experimental variation in the sample to exploit. However, the analytical approach (fully outlined below) engaged in a three-step approach to estimate three versions of the empirical model looking at the effect of the career appointments, including a simple regression model, one with full controls (see Table 4 below) and a also a propensity score matching approach (PSM), used to create the comparison group. The comparison group was composed of students who had not engaged with the career appointments, and who were matched with the intervention group on a range of characteristics other than engagement (and level of engagement) with the career appointments. The sample characteristics are outlined in Table 5 and discussed in the Findings section.

Impact evaluation: sample selection

To carry out the impact evaluation analysis, this efficacy pilot used data about disabled *undergraduate* students, who either have engaged, or not engaged with the disabled students' career appointments.

The analysis specifically focused on three graduating cohorts, to ensure that Graduate Outcome data was potentially available for them (from a temporal perspective) and also

[3] Graduate outcomes survey is owned by Higher Education Statistics Agency (HESA) and is the biggest UK national survey that captures the perspectives as well as the outcomes of recent graduates. It surveys graduates, 15 months after graduation: https://info.lse.ac.uk/current-students/careers/what-graduates-do/graduate-outcomes

that the nature of the disabled students' career appointments was consistent over the period of time during which the students were enrolled. These cohorts are graduating students in the academic years 2017-18, 2018-19 and 2019-20 respectively. It is noteworthy that these cohorts include the pandemic-affected period beyond March 2020, with the data collection from graduates happening, respectively, the first week of September 2019, 2020, and 2021.

Given that between-cohort comparisons are not the aim of this efficacy pilot, and that the sample sizes would substantially limit the power of cohort-specific analyses, the analyses have included a dummy variable identifying each cohort (to account within each respective model for any cohort effects) but have not disaggregated between the cohorts.

The analytical sample included undergraduate students who had declared a disability; and those deemed to have self-identified as disabled by virtue of attending a dedicated disabled students' career appointment (even if they had not formally declared a disability).

Table 1 outlines the sample at protocol stage, prior to any matching being undertaken; and the full analytical sample as used in the full propensity score matching model estimated as per the analytical strategy section below.

While the overall sample provided is moderately large, the sample of disabled (or deemed disabled) students is substantially smaller. With the intervention group (disabled students engaged with the career appointments at 30), the sample from which the comparison group could be derived was 268 students (298 overall minus the 30 intervention group students).

Table 1: Sample sizes (at protocol stage and analysis stage)

Sample (across all three graduating cohorts)	Sample (N)
At protocol stage: full sample provided	**2,371**
Disabled/Deemed Disabled Students	**298**
Disabled/Deemed Disabled Students engaged with career appointments	30
Disabled/Deemed Disabled Students not engaged with career appointments	268
At analysis stage: analytical sample for full propensity score matching model (smallest sample, for job satisfaction secondary outcome measure)	
Disabled/Deemed Disabled Students engaged with career appointments	30

Disabled/Deemed Disabled Students not engaged with career appointments	47
At analysis stage: analytical sample for full propensity score matching model (largest sample, for employment primary outcome measure)	
Disabled/Deemed Disabled Students engaged with career appointments	30
Disabled/Deemed Disabled Students not engaged with career appointments	135

Impact evaluation: outcome measures

Primary and secondary measures that were used as outcomes for the impact evaluation analyses are outlined in Table 2 below. These included:

- Two primary outcome measures related to employment: employment type (including a category of unemployment, as per Table 1 below); and earnings for employed graduates. These two specific measures were selected following the Theory of Change model that identifies them as the theorised outcomes of the disabled students' career appointments programme. Data on these outcomes were obtained from administrative data regularly returned by the Higher Education Statistics Agency (HESA) to the LSE team from the Graduate Outcomes survey.
- One secondary outcome measure: an affective outcome on satisfaction with employment created from individual items asked in the Graduate Outcome survey as a composite measure. As Table 2 below illustrates, this variable showed higher levels of non-response in the sample. The implications of this issue are discussed later.

Table 2: Outcome Measures

Variable	Definition	Data source and form	Maximum valid N in provided sample	Maximum valid N in analytical sample
Primary outcome measure				
Employment	**Type of employment** (full/part time and combinations with further study; unemployed)	Existing data from Graduate Outcomes (HESA). Source variable: XACTIVITY. One single categorical variable (categories are: employed full time; employed part time; employed and study; further study; unemployed; other or unknown employment) from which a single binary outcome variable (employed vs any other category) was derived	2,371	298

Earnings	**Annual earnings** (where available in £ before tax) for main employment	Existing data from Graduate Outcomes (HESA). Source variable: SALARY One single continuous variable (log transformation used)	1,499	194
Secondary outcome measure				
Job satisfaction	**Affective outcome** around employment: composite measure	Existing data from Graduate Outcomes (HESA) One single continuous composite variable generated through a factor analysis approach (Annex E) from 3 questions asking about satisfaction with employment: 1. The extent to which the graduate's current work is meaningful (WRKMEAN) 2. The extent to which the graduate's current work fits in with their plans for the future (WRKONTRACK) 3. The extent to which the graduate has utilised their skills they have learnt in their studies in their form of employment (WRKSKILLS)	1,240	141

Impact evaluation: power calculations

Standard assumptions used to calculate the minimum detectable effect size (MDES) in randomised trials do not directly hold for PSM approaches (primarily because of the manner in which the comparison group is derived).

As discussed above, it is essential to note that whatever the estimated MDES, the strength of causal inference is limited in this efficacy pilot, even once applying a PSM approach given the self-selection of students into the disabled students' career appointments.

Parameters routinely used in MDES calculations are outlined below for the purposes of clarity. MDES estimates are then provided in Table 3 below.

Our assumptions are:

- significance level: 0.05
- statistical power: 0.8
- variance in outcome explained by relevant covariates: 0.5

MDES was first estimated using the parameters above under a balanced trial design (that is, using the further assumption of 50% of the sample in the intervention group, using the intervention group sample size from Table 1 above).

A further MDES was then estimated, also using a trial design, but using the maximum possible sample size of 298 (in Table 1 above), whereby 10% of the overall sample is in the intervention group.

Finally, a PSM MDES was estimated, using the achieved sample sizes in the analytical sample as per the full propensity score matching model for the smallest achieved sample (see Table 7 in the Results section), and using the achieved distribution of individuals between the 'intervention' and 'intervention' groups respectively.

Table 3: Power Calculations

Sample size (total)	Size of intervention group	Size of comparison group	MDES (Cohen's d)
Assuming balanced trial design with above parameters			
60	30	30	0.520
Assuming trial design with above parameters, and 10% of sample in intervention group			
298	30	268	0.384
Assuming trial design with parameters as per full regression model for employment outcome measure (sig 0.05; power 0.8; explained variance 0.28) (Table 7 for results)			
279	30	249	0.456
Assuming trial design with parameters as per PSM model for employment outcome measure (sig 0.05; power 0.8; explained variance from pseudo R squared 0.22) (Table 7 for results)			
165	30	135	0.504

All of the above minimally detectable effect sizes are very large for evaluations in education. Specifically, the MDES for the PSM is very high at 0.504 for the employment outcome, and is even larger for the job satisfaction outcome in the PSM (at 0.620). This represents a substantial threat to the validity of this efficacy pilot, because the smallest identifiable effect given the available samples is larger than would reasonably be

expected given the intensity and likely impact of the career appointments on the three employment-related outcomes in the analysis.

Impact evaluation: analytical strategy

The objective of the analysis in the impact component of this efficacy pilot was to evaluate the effectiveness of the disabled students' career appointments on undergraduate students' employment-related outcomes.

Specifically, the impact evaluation analysis has estimated the effectiveness of the disabled students' career appointments programme on improving disabled students' outcomes for the students who have attended at least one appointment. Therefore, this was done by calculating the Average Effect of the Intervention on the Treated (ATT).

First, an OLS regression model was estimated, comparing the outcomes of treated students with those untreated, amongst students eligible (that is, disabled students). This model took the form:

$$y_i = \alpha + \beta_1 \text{intervention}_i + \varepsilon_i$$

Equation 1: OLS model without controls

where y is each respective primary and secondary outcome measure, α is the intercept, β_1 is the coefficient of interest for the variable intervention, identifying whether students have engaged with the career appointments, and ε_i is the error term.

Second, an OLS regression model was estimated, that included a detailed set of independent variables, including gender, ethnicity, socio-economic status, etc., as per Table 4 below. These are the same variables as were later used for matching purposes. The model estimated was:

$$y_i = \alpha + \beta_1 \text{intervention}_i + \beta_2 X_i + \varepsilon_i$$

Equation 2: OLS model with controls (matching variables)

where y is each respective primary and secondary outcome measure, α is the intercept, β_1 is the coefficient of interest for the variable intervention, identifying whether students have engaged with the career appointments, and Xi is a vector of control variables, the same as the matching variables outlined in Table 4 below. ε_i is the error term.

The OLS model is likely to provide biased estimates of the causal effects because of neglected heterogeneity stemming from the fact that students self-select into the programme. A partial solution to this problem is to attempt to match participants and non-participants in observational data. The adoption of matching techniques has allowed us to partly consider some of the bias in the OLS regression.

It is worth noting that the direction of the likely bias is not clear: disabled students who self-selected into the programme might be better or worse than students who didn't

choose to participate in unobservable ways. For example, the students might have self-selected into the programme because they were more motivated about their education and later employment (a positive bias); or more concerned and less confident on their abilities in relation to their later employment (a negative bias), in comparison to the comparison group of disabled students who did not engage with the disabled students' career appointments.

Therefore, a PSM approach was then used to estimate the effects of attending the programme on student outcomes. Inference was restricted to samples where there was overlap in the distribution of covariates across the intervention using PSM, that is, using only samples with common support. The logic of the PSM was to match appointment-participating students who were as comparable as possible in all other aspects to disabled students who did not engage with the appointments, with the matching on the propensity score looking to ensure that they had similar propensities to be treated (that is, to engage with the disabled students' career appointments).

The PSM approach was undertaken using the STATA routine psmatch2.[4] In one step, this routine first estimates the conditional probability (the propensity score, e in equation 3 below) of being treated (that is, of engaging with the disabled students' career appointments) based on the set of matching variables outlined in Table 4 below (and encompassed in vector X in equation 3 below).

$$e_i = Pr(Z_i = 1|X_i)$$

Equation 3: The propensity score as the conditional probability of being treated

Where e is the estimated propensity score, Z_i represents intervention participation, and X_i is the vector of matching variables.

In the same step as above, the routine then uses this estimated propensity score to create a matched comparison group, and for each student in the intervention group (that is, those who engaged with the career appointments) finds a comparison member with the closest possible propensity score. The approach taken here is PSM with replacement, which allows the same observation to theoretically be included as a comparison for several observations in the treatment group. This is relatively unproblematic when the number of potential comparison group observations is high, as is the case here. Non-matched students are dropped from the analysis and the analysis undertaken only for observations on common support. Common support indicates that only the range of the estimated propensity score where observations from both the treatment and comparison group may be found, are used in the analysis[5]. This matching

[4] E. Leuven and B. Sianesi. (2003). "PSMATCH2: Stata module to perform full Mahalanobis and propensity score matching, common support graphing, and covariate imbalance testing". http://ideas.repec.org/c/boc/bocode/s432001.html.

[5] Caliendo, M. and Kopeinig, S., 2008. Some practical guidance for the implementation of propensity score matching. *Journal of economic surveys*, *22*(1), pp.31-72.

approach (via the propensity score) attaches appropriate weights to the observations in the comparison group so that any bias (or difference) in their distribution of their observable characteristics (from Table 4 below) compared to the unmatched samples is minimised.

Table 4 Matching Variables

Matching variables included in the calculation of the propensity score Small non-material changes compared to protocol are outlined *in italics*.	
Demographic characteristics	Age* (*operationalised, different to protocol, as mature student vs not*)
	Gender** (categories: female, male, other)
	Ethnicity (broad categories)
	POLAR (Participation of Local Areas) quintiles
	IMD quintiles
Degree specific data	Degree Subject (broad categories based on ward and subject combination)
	Year of Graduation (operationalised as graduating year)
Disability specific information	Disability Status (*constant for all students in the analytical sample, that is, all individuals in the analytical sample are disabled (or deemed disabled)*

*At protocol, the intention was to use a continuous variable. The data provided included the 'mature' category instead, which, given the small sample size for the analysis, was not deemed problematic.
**At protocol, the gender variable was specified as a binary with male as the reference category. At analysis stage, a further category of 'other gender identity' was added, retaining the same reference category as at protocol..

Sub-group, dosage, compliance, and fidelity analyses

No sub-group analysis was planned or carried out. Similarly, no dosage or compliance or fidelity analysis was planned or undertaken given the nature of this efficacy pilot.

2.3. Process evaluation design

To address working hypothesis B, a qualitative process evaluation was also designed and undertaken. As part of this, emphasis was placed on the perspective of disabled students currently engaging (or having at some point in their study journey engaged) with these career appointments. This information was collected through a qualitative online asynchronous survey with these students, outlined in what follows.

Process evaluation: data collection approach

An asynchronous approach for data collection was chosen as this was intended to allow students to engage with the evaluation at a time and in a manner that was most convenient for them, so as to minimise response burden on participants . This asynchronous approach took the form of a very brief survey of current and recent participants (see below for sample details), eliciting data by means of a very brief series of prompts (the set of prompts provided is included in Annex B). The survey was administered by the LSE Careers Team via their existing online contact system.

The survey consisted of seven background information questions (i.e. around gender, ethnicity, course information and student status), two open-ended questions and a final another document (if desired) to provide or complement their answer to the two open-ended questions. The open-ended questions asked participants to:

- Describe their experience of the LSE Careers Disabled students' appointments.
- Explain whether the appointments had made a difference for them, and if so, why.

The approach was also designed to allow participants to provide their answers in the format that best suited prospective respondents, and therefore the data collection method was not represented by a questionnaire, but rather a series of prompts that allowed for any form of data, including text (entered in a text box or uploaded), audio (voice note), or images (as long as they did not include any identifiable information on anyone). Only text answers were provided by respondents, as outlined in the Findings section (e.g., written answer, voice note, an image).

While this approach minimised the potential burden on respondents, its disadvantage rested in the fact that not all aspects of the theory of change could be addressed through the small number of questions. This aspect is discussed in relation to the interpretation of results later in this report.

The aim of this data collection approach was to ensure non-intrusive engagement with participants. Similarly, to minimise the sharing of personal identifiable information, responses to the prompts were collected without any personally identifying information such as names, etc.

Process evaluation: sample selection

Two groups were relevant to this qualitative approach: first, current disabled students who had ever (or were at the time of the data collection) engaging with the disabled students' career appointments; and second, graduates who at some point during their study had engaged with the disabled students' career appointments.

Two inclusion criteria were used for reaching out to potential respondents:

- An individual student has attended any of the disabled students' career appointments.
- An individual student has declared a disability (those who have attended a disabled students' appointment were deemed to have self-identified as disabled).

There were no sample size requirements for this aspect of the data collection. Given that the individual respondents could choose whether to engage or not with the data collection process, and that the expectation was of a very low response rate, all current and recent participants were invited to take part. This was a conscious decision, even though it meant that graduate students may also engage with the process, even as the impact evaluation focused on undergraduate students only. Responding to the asynchronous qualitative data collection was voluntary.

A total of eleven responses were collected, of which ten were complete, and most (Table 10) were graduate students. All responses were text based and all were very short in nature. The Findings section outlines the profile of the respondents in full while protecting their anonymity. The Discussion section further engages with the implications of this very small sample size for the robustness of insights from this process evaluation component.

Process analysis: analytical approach

Thematic analysis was intended to be used to examine the asynchronous survey answers. This intended to characterise the type of perceived impact that participants report the appointments had, as well as any reported barriers or areas for improvement for the sessions. More specifically, around impact, focus was placed on identifying whether students report:

- Being able to better articulate their understanding of their own disability,
- Being more comfortable requesting appropriate adjustments required (from employers) in response to their disability, and
- Feeling empowered to discuss and act upon adjustment requirements.

While the analytical approach ultimately applied was thematic analysis, the limited sample (ten full responses) and small amount of data (with each respondent providing short answers to the prompts only) meant that the analysis was more comprehensive, and all points made by all respondents are outlined in the relevant Findings section below.

2.4. Ethical considerations

The efficacy pilot was submitted and received approval from two ethics committees, one at LSE, and one at Cambridge. Considerations of relevance to the ethics approval process revolved around the collection of data from, and use of data about, disabled students. This included the potential sensitivity of questions in the process evaluation around disabled students' perceptions of effectiveness of the disabled students' career appointments. The impact analysis outlined above was designed to minimise the need to collect any additional quantitative data from individuals, relying exclusively on monitoring or administrative data. The process evaluation also outlined above minimised the burden on potential participants by taking the asynchronous approach to data collection and offering a variety of response options to ensure flexibility of approach to any needs that responding students may have when engaging with the data collection.

3. Findings

3.1. Impact evaluation: findings

Description of data

The background characteristics of all disabled students in the sample are outlined in Table 5 below, disaggregated by whether students had engaged with the career appointments. Overall, there is generally good balance between the two groups on these background characteristics: while there are some characteristics where there are differences between the students engaged and those not engaged with the career appointments, many of these differences are small, as follows. It should be noted that any balance achieved is not by design; and in the PSM models, the comparison group will have different characteristics (as described subsequently in relation to each model estimated for each of the three outcome measures). Disabled students engaged with the career appointments are slightly more likely to be mature (that is, 21 years of age or older at the start of their course, 4.1 percentage points difference) than those not engaged; they are more likely to be female (13.7 percentage points difference) and less likely to be of a black or minority ethnic background (9.2 percentage points difference) and more likely to be in the highest quintile of the Index of Multiple deprivation (IMD) (15.1 percentage points difference).

Table 5: Background characteristics of sample of disabled students, by intervention group

Background characteristics			
	Disabled students ever engaged with career appointments (%)	**Disabled students never engaged with career appointments (%)**	**Full sample of disabled students (%)**
Demographic characteristics			
Age Student is mature	6.7%	2.6%	3.0%
Gender Female	60%	46.3%	47.7%
Ethnicity Black and Minority Ethnic* White Preferred not to report	33.3% 66.7% 0.0%	42.5% 54.1% 3.4%	41.6% 55.4% 3.0%
POLAR Quintile 1 Quintile 5	3.3% 50%	3.4% 45.5%	3.4% 46.0%

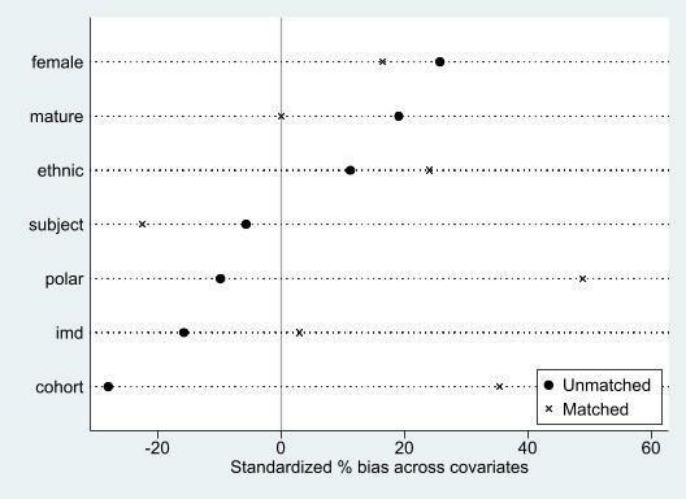
IMD quintiles Quintile 1 Quintile 5	 0% 36.7%	 4.1% 21.6%	 3.7% 23.2%
Degree specific data			
Degree award and subject	Table in Annex C		
Graduating year 2017/18 2018/19 2019/20	 43.3% 26.7% 30%	 26.1% 38.1% 36.8%	 27.9% 36.9% 35.2%
Total N	30	268	298

*Note: the Black and Minority Ethnic group overlooks the high level of diversity within that categorization.

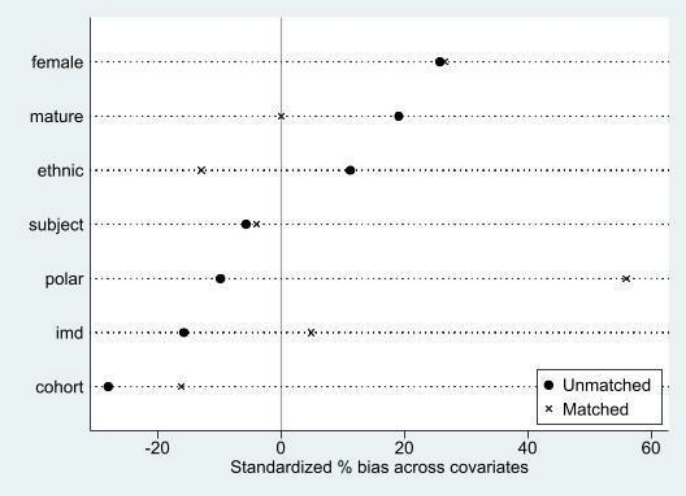
In relation to the PSM models, the matching approach resulted in the relative bias between the matched and unmatched samples mostly decreasing, for each of the three respective models (employment and wage primary outcomes and job satisfaction secondary outcome, even as the samples were reduced due to the need to identify appropriate matches to students in the intervention group (as outlined in Tables 7-9 below). Figure 1 below illustrates the reduction in bias for the majority (but not all) of the above background characteristics across each of the PSM models for the three outcomes. The increases in matching bias emerge particularly from the variable identifying the subject of the degree taken by students; and the measure of local area higher education participation (POLAR). As Table 5 above and Annex C outlines, the analytical samples become very small when split by the respective categories of these variables (that is, by broad degree subject and respectively, POLAR quintile). These small sample sizes are what are likely to be driving the bias increase when going from the unmatched to the matched sample. Given that bias on other measures reduces with matching, the PSM remains a valid approach, though it does raise issues around sample size requirements, which are addressed when the final methodological recommendations are discussed.

Figure 1: Standardised bias across covariates. All three outcomes

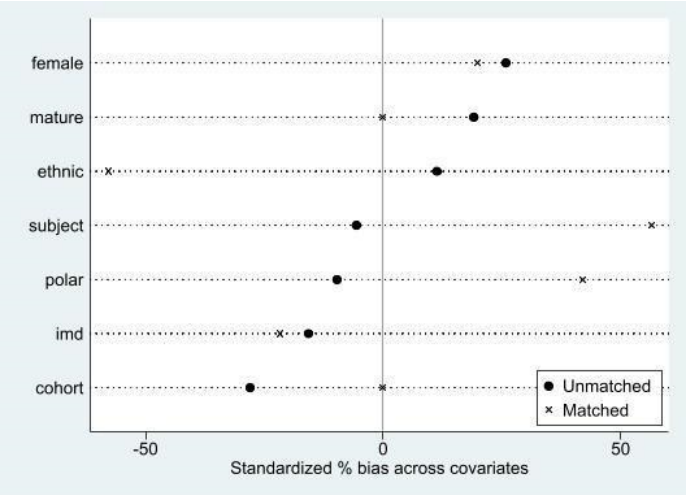
Employment outcome



Wage outcome



Job satisfaction outcome



As noted above, while background data was available for the full sample of disabled students, outcome data was not. This is a function of non-response to the Graduate Outcomes survey: not all graduates engage with the survey. Table 8 below illustrates the achieved sample sizes for each of the three outcome measures, noting that the employment primary outcome benefitted from most data, while the job satisfaction secondary outcome measure from least.

In relation to employment (with graduates classed as employed if they were either in full-time or part-time employment or were both employed and studying at the same time), 86.7% of the students who had engaged with the disabled students' career appointments at any point in their degree were employed at the time of their respective answers to the Graduate Outcomes survey. The comparable figure for students not engaging with the career appointments stood at 79.5%.

For the wage secondary outcome, a small number of respondents provided this in a currency other than £. These are therefore excluded from analysis, given that their earnings would not necessarily be comparable to those in £. After this exclusion, disabled students in the intervention group self-reported a mean pre-tax salary in £ of £29,599, compared to £33,846 for students who had never engaged with the disabled students' career appointments.

Finally, for the job satisfaction measure, a factor score was calculated after the factor analysis taking the three items around job satisfaction (as outlined in Annex E); this factor score had a mean of 0.005 for students in the intervention group and a lower score of -0.07 in the group of students never having engaged with the appointments.

It must be reiterated that, as with the background characteristics, and for the purposes of the propensity score matching approach whose results are reported below, the non-intervention group does not contain all individual students for whom data is reported here, but its make-up is outlined in relation to each respective PSM model below.

Table 6: Outcome measure, by intervention group

Outcomes			
	Disabled students ever engaged with career appointments (%) (M/SD)	**Disabled students never engaged with career appointments (%) (M/SD)**	**Full sample of disabled students (%) (M/SD)**
Primary outcomes			
Employment			
Graduate is employed	86.7%	79.5%	80.3%
N	30	249	279

Salary Wage (in £ before tax, where reported in £) N	£29,559 (£15,911) 24	£33,846 (£17,793) 157	£33,278 (£17,575) 181
Secondary outcome			
Job satisfaction (Composite measure factor score) N	0.005(0.69) 18	-0.07(0.63) 123	-0.06 (0.63) 141

Primary outcome findings: employment

The results of the statistical analysis taking the three-step approach outlined in the Methodology section above are presented in Table 7 below. As the Table shows, the sample size for the PSM (3) is smaller than that of the regression models (1) and (2) because of the matching approach. All 30 observations in the intervention group were used in the PSM model, with 135 observations matched, with the matched sample balance illustrated previously in Figure 1.

The results in Table 7 point to no statistically significant effect of the intervention on the employment primary outcome, as based on the PSM specification (model (3)). For the PSM, the coefficient for the intervention represents the average treatment effect on the treated, which in this case is negative but not statistically different from zero. The standardised effect size, also reported in Table 7, is -0.35, which could be considered a medium effect size, however this is smaller than the MDES previously indicated for this analysis in Table 3.

For robustness and comparison, and following steps pre-specified in the protocol, two OLS models (not using PSM) are also reported in Table 7 below. The results are also statistically non-significant and very small, with the model that includes all controls and most closely resembles the PSM model (2) suggesting a very small standardised effect for the intervention of 0.01.

Table 7: Primary outcome results: employment

Primary outcome	**Employment**		
	(1)	**(2)**	**(3)**
	No controls	**Controls**	**PSM**
Coefficient for Intervention (Std. error)	0.071(0.063)	0.005(0.083)	-0.125(0.068)

Effect size (Cohen's d) (95% CI)	0.18 (-0.20 0.56)	0.01 (-0.36 0.39)	-0.35 (-0.74 0.05)
N intervention	30	30	30
N non-intervention	249	249	135
R-squared	0.00	0.28	0.22

Note: The dependent variable in columns (1)-(3) is the probability of being employed (full time, or part time, or employed alongside studying). The treatment variable is whether the student ever engaged with the disabled students' career appointments intervention (that is, ever took an appointment). The analytical sample is restricted to disabled students only. The control variables are as per Table 4: polar quintile, IMD quintile, gender, ethnicity, cohort, course subject, and mature student status. Standard errors are reported in parentheses. Significance levels: +p<0.10, * p<0.05, **p<0.01. Cohen's d calculated using full sample standard deviation of the outcome variable.

Primary outcome findings: wage

The results for the wage primary outcome measure mirror those of the employment outcome. Both OLS models run for the purposes of robustness checking and the PSM analysis yields statistically non-significant results (Table 8) for the effect of the intervention on the wage outcome. The uncontrolled OLS model (4) results in a standardised effect size of -0.22, with the effect size reducing in the model with all controls (5) and returning to the slightly larger 0.21 for the PSM.

The implications for the results of the reduction in sample size compared to the first primary outcome measure above are discussed subsequently.

Table 8: Primary outcome results: wage

Primary outcome	**Wage**		
	(4)	**(5)**	**(6)**
	No controls	**Controls**	**PSM**
Coefficient for Intervention (Std.err.)	-0.281(0.293)	-0.091(0.293)	-0.255(0.205)
Effect size (Cohen's d) (95% CI)	-0.22 (-0.65 0.21)	-0.07 (-0.50 0.36)	-0.21 (-0.71 0.28)
N intervention	24	24	21
N non-intervention	156	156	65

R-squared	0.01	0.48	0.278

Note: The dependent variable in columns (4) to (6) is log earnings for students with wages reported in GBP (£). The treatment variable is whether the student ever engaged with the disabled students' career appointments intervention (that is, ever took an appointment). The analytical sample is restricted to disabled students only. The control variables are as per Table 4: polar quintile, IMD quintile, gender, ethnicity, cohort, course subject, and mature student status. Standard errors are reported in parentheses. Significance levels: +p<0.10, *p<0.05, **p<0.01. Cohen's d calculated using full sample standard deviation of the outcome variable.

Secondary outcome findings: job satisfaction

In relation to the secondary outcome measure of job satisfaction, all estimated effect sizes, from all 3 model iterations run ((7) to (9)) point to positive effect sizes, smallest for the model with no controls (7) and largest for the PSM (9), at 0.67. None of these effect sizes, or of course the underlying regression coefficients (Table 9) are statistically significant. This mirrors results for the primary outcome measures and is not surprising given the very large estimated MDES values reported in Table 3.

Table 9: Secondary outcome results: job satisfaction

Secondary outcome	**Job satisfaction**		
	(7)	**(8)**	**(9)**
	No controls	**Controls**	**PSM**
Coefficient for Intervention (Std.err.)	0.076(0.160)	0.120(0.197)	0.383(0.365)
Effect size (Cohen's d) (95% CI)	0.12 (-0.38 0.62)	0.19 (-0.31 0.69)	0.67 (-0.12 1.22)
N intervention	18	18	17
N non-intervention	123	123	60
R-squared	0.00	0.41	0.36

Note: The dependent variable in columns (7)-(0) is job satisfaction, with higher values indicating more job satisfaction. The treatment variable is whether the student ever engaged with the disabled students' career appointments

intervention (that is, ever took an appointment). The analytical sample is restricted to disabled students only. The control variables are as per Table 4: polar quintile, IMD quintile, gender, ethnicity, cohort, course subject, and mature student status. Standard errors are reported in parentheses. Significance levels: +p<0.10, *p<0.05, **p<0.01. Cohen's d calculated using full sample standard deviation of the outcome variable.

Impact evaluation: findings summary

This impact evaluation therefore finds no statistically significant effect of the intervention on the three pre-specified outcome measures, a finding which requires substantial discussion considering the small sample, associated large minimally detectable effect size, and going back to the theory of change associated with the intervention.

It must be stressed that these findings do not suggest that the intervention is ineffective. Instead, the small sample sizes available for the analysis as a result of the scope of the intervention and engagement by disabled students with the career appointments limits the ability of the analysis to potentially detect anything but vastly large effects from the intervention, which were not hypothesised in the first place.

The implications of this for the intervention and continued evaluation of the intervention are considered in the Discussion section below.

3.2. Process evaluation findings

Participant profiles

In March 2023 students that engaged with the 'Disabled Students' Career Appointments' were invited to participate in an asynchronous online survey to capture information on their experience with the service. As outlined above, to be invited to participate two inclusion criteria were used: 1) the student had attended at least one disabled students' career appointment; 2) the student had declared a disability (those who have attended a disabled students' appointment were deemed to have self-identified as disabled). Participation was voluntary. All respondents consented to part-take in the survey, which was captured in the welcome screen of the survey.

A total of eleven students engaged with the data collection tool. Their characteristics are reported in Table 10 below, reporting small numbers in a way that protects the anonymity of the participants. While the number of responses is limited, the respondents covered a variety of backgrounds and courses. Table 10 provides an overview of their background characteristics. Most participants were female students, from the UK, reported having a white ethnicity and to follow a postgraduate study. A wide range of departments were reported by students when asked which department provided their programme. None of the participants reported undertaking the same Bachelor or Master's programme, hence each followed a different course.

Table 10: Overview of participants' characteristics

Characteristic		Number of respondents (of total eleven)
Gender		
	Female	9
	Male	<3
Ethnicity		
	Asian - Chinese or Chinese British	<3
	Asian - Indian or Indian British	<3
	Other Asian background	<3
	White	7
Region		
	Overseas	4
	UK	7
Study Level when student engaged with offer		
	Postgraduate	9
	Undergraduate	<3
Student status		
	Current	7
	Alumni	4

Note: Participants were also asked to specify the name of the department and separately of the programme they followed. To ensure participant anonymity answers to these questions are not presented here.

Process evaluation: findings

Ten participants offered full and complete answers to the questions. The subsequent findings reflect these ten responses, which represents a very small sample. It is noteworthy that some of these respondents were postgraduate students when they engaged with the offer, rather than undergraduate students, who are the focus of the impact analysis. As Table 7 indicates, several respondents were alumni.

All respondents described their experience with the career appointments as positive. Many found them helpful or useful (P1, P2, P3, P9, P10), with some expressing high amounts of satisfaction with the sessions, describing them as "incredibly empowering" (P10), "excellent" (P9) and "absolutely fantastic" (P8).

Five respondents highlighted feeling supported by the member of staff providing the appointments (P1, P4, P6, P7, P8). In addition, one respondent described feeling "comfortable and relax[ed]" during the sessions (P3), while another noted that the sessions helped them build their confidence, namely, *"[The careers adviser] was reassuring, professional and really helped build my confidence*" (P5). One of the assumptions underpinning the intervention is that the careers officer builds a rapport with session participants. The previously described survey answers provide evidence that this was achieved.

Apart from valuing the rapport built with the careers' adviser, participants also noted other aspects of the sessions that they found helpful or that could be improved. Two respondents appreciated the length of the sessions compared to the other career appointments provided by the LSE's careers service (P3, P4). One of them explained that it was useful to be able to take time to formulate their answers without feeling time pressured. In their words, given their hearing loss "*[i]n the disabled student appointments, I have enough time to organise my questions and express [myself] slowly*" (P3). The other respondent also valued the fact that they could access as many sessions as were needed and not have these sessions capped (P4).

One of the respondents noted that they were sometimes unable to access the sessions as the timing of them clashed with their courses (P8). Hence, the programme delivery team could consider providing some sessions during non-class time. The same participant also noted that despite the sessions being longer and feeling at ease to better express themselves, sometimes they found that the adviser spoke too quickly. In this case, the participant clarified that English was their second language and that their ability to understand the conversation was in addition compounded with their hearing loss. The programme delivery team may want to develop ways to further strengthen the provision of the programme for non-native English speakers.

In the answers to the second open-ended question, all participants reported that the appointments made a positive difference on three specific aspects (as below) to their experiences, either within higher education or for job searching. Following the programme's Theory of Change, participants' answers were analysed to identify whether participants attributed *impact* of the sessions in terms of:

- Being able to better articulate their understanding of their own disability,

- Being more comfortable requesting appropriate adjustments required (from employers) in response to their disability, and
- Feeling empowered to discuss and act upon adjustment requirements.

The survey answers provide experiential evidence that change at these levels was achieved. Three participants explicitly reported that thanks to the appointments their acceptance of their disability increased (P6), as well as their understanding of it (P2, P10). For example, "*[t]he different panels and conferences helped me learn how to advocate for myself and understand my own strengths better*" (P10). One participant reported receiving emotional support to deal with the new diagnosis of their autism (P8), something they valued greatly and linked to being able to successfully complete their degree. Furthermore, one participant reported that the sessions equipped them with skills to be able to request adjustments (P2).

In terms of navigating job applications, participants reported increased understanding of the application process, increased confidence to navigate it, as well as confidence to disclose their disability to potential employers (P2, P7, P9, P10). In the words of participants:

> *I also gained the confidence to disclose my disability and apply to different jobs because of the great career mentorship.* (P10)
>
> *The appointments] helped me to understand how to interview concisely in a way which is digestible for me* (P9)
>
> *[The careers adviser] helped me preparing for an assessment centre, and did so in such a way which gave me plenty to think about whilst also embedding in me a level of confidence and self-belief which made the business of preparation all that much easier.*(P7, emphasis added)
>
> *In the past I had struggled with understanding how and if to disclose my disability throughout the application process and at work. [The careers adviser] ran me through a lot of information regarding this and really eased my nerves about it*. (P2)

Taken as a whole, the responses suggest that the expected *outputs*, *outcomes* and *impact* that the Disabled Students' Career Appointments were, at least for this group of participants, realised. Their answers can be taken as evidence that points towards the idea that the appointments helped the disabled students engaging with them feel overall empowered around their disability and empowered to navigate Higher Education and to enter employment.

There was also evidence in participants' responses to suggest that they had gained confidence to request adjustments, a theorised *impact* in the Theory of Change model.

As part of *outputs* the Theory of Change specified that it would be expected that:

- Students feel comfortable to share their experience with the careers officer.
- Sessions perceived as useful captured through positive feedback from participating students after the sessions.
- Increased uptake (more demand including follow-up sessions; word-of-mouth recommendations).
- Improved experience of Higher Education.

The findings above provide some evidence that each of these aspects were reported by at least one participant, with the first two points having more evidence supporting them than the latter two. However, this should not be taken as evidence that the programme is less able to achieve these outputs but rather should be interpreted within the limitations of the small sample of process evaluation respondents.

In terms of *outcomes*, it was theorised that the sessions would aid:

- Students feel less stigma about their disability.
- Students have increased confidence to navigate the employment world.
- Students are more knowledgeable pro-diversity employers.

Similarly, the first two points are corroborated with the most evidence. However, none of the respondents explicitly mentioned whether they felt better able to identify pro-diversity employers. Once again, this should not be interpreted as evidence against the intervention, but rather interpreted in relation to the few responses obtained and the deliberate approach of minimising the questions in the data collection stage to avoid burden.

4. Discussion

The findings from the impact evaluation section suggest that the analysis was not able to identify any statistically significant effects of the intervention on any of the three outcome measures. These results must be set within the context of the achieved analytical parameters.

First, as outlined above, the causal inference is limited in this efficacy pilot, regardless of the application of what is normally considered a quasi-experimental method (the propensity score matching approach). This is because of the self-selection into the

intervention. While the PSM generates a comparison group of students with matched propensities (estimated on the basis of a series of observed characteristics) to engage with the disabled students' career appointments, it remains the case that the quantitative analysis cannot explore the range of motivations behind students with similar propensities deciding to engage or not. Even further, a range of unobservable characteristics may be driving selection into the intervention, and, as previously discussed, the direction of bias this may generate is unknown at this point.

This bias may be explored in more detail through further engagement with disabled students choosing (and importantly, choosing not) to engage with the career appointments. Understanding their motivation may therefore provide ways to address take-up – as long as that exploration sits alongside a consideration of the implications of potential expansion on the service providers. Although outside of the scope of either impact or process evaluation components in this efficacy study, an exploration of the intervention's practical implementation may provide this counterpoint to the student perspective. This is because the intervention's theory of change captures hypothesised processes of change for the engaged disabled students, but not for relevant staff.

A second consideration of importance in relation to the impact component of this efficacy pilot rests in the set of outcome measures selected for analysis. While the measures are robust, obtained from established data sources (the Graduate Outcomes survey), and well aligned with the hypothesised outcomes of the intervention (as per the theory of change), they are also relatively distal outcomes. And further, suffer from the fact that employment, wages, and affective outcomes in relation to the job achieved may all be reasonably influenced by factors outside of the intervention. While this is the case in most evaluations, it is particularly relevant here for two reasons. The first reason rests in the fact that one such factor may relate to the levels of support provided by employers to disabled employees, including any legally required reasonable adjustment: these have been reported to continue to be insufficient to allow full labour force participation by disabled individuals. The second reason rests in the impact of the pandemic on the labour market (therefore affecting the employment and wage outcomes), and the disproportionately higher impact of the pandemic on disabled individuals.

It is likely, therefore, that the impact estimates generated by the analysis above are not only conservative, they are also artificially lowered by these circumstances. Or, differently, it may be because of these circumstances that the above findings have resulted from the analysis. Future evaluations taking in periods of time beyond the pandemic may address this issue and may also look cohort-by-cohort, if the sample sizes are appropriate, as follows.

Compounding the above issues is the very low sample size, particularly in relation to students in the intervention group, that is, disabled students engaged with disabled

students' career appointments at least once during their course of study. This was recognized as a threat to the validity of the efficacy pilot at protocol stage, but it was important to pursue the analysis, if only as proof of principle, and to extract practical recommendations for future similar analyses, which will be explored elsewhere.

Although limited by the small sample size, the process evaluation was particularly useful for contextualising the impact evaluation results and suggested that the majority of hypothesised processes and experiences associated with engagement with the disabled students' career appointments was supported by participants' responses. In summary, the process evaluation found that the disabled students' career appointments were well received and valued by students that took part in them. There was also evidence that the career appointments could lead to the desired changes around increased understanding and acceptance of students' own disability, increased confidence to request adjustments and to navigate job applications and the employment world. Such findings provide emerging evidence that the intervention can lead to positive impact, at a minimum as identified by beneficiaries. These results notwithstanding, it is possible that other participants' perspectives may provide further suggestions for service improvement. Given that the sample of respondents was entirely self-selected it may also be the case that other students engaged with the appointments may hold different views as to its perceived effectiveness. Similarly, consulting larger samples of participants in the appointments may also facilitate an understanding of how the appointments vary in their perceived effectiveness by type of disability, prior labour market experiences, or any other potentially confounding factors. Such larger samples would also ensure wider representation of the diverse backgrounds of (disabled) students at LSE, so that a comprehensive range of perspectives may inform the intervention, including any sustainability or expansion considerations.

5. Conclusion

This efficacy pilot was undertaken with a view to exploring how the disabled students' career appointments may contribute to employment related outcomes upon graduation from LSE; and what disabled students' experiences of engagement with the appointments were. A further aim of the study was to understand how evidence generation approaches may be deployed to improve the causal inference around the impact of the intervention.

The analysis has resulted in findings suggesting of disabled students finding the appointments supportive of their specific needs, improving their understanding of their own disability, both independently, and in relation to their employment needs, and improving their ability to articulate how such needs would translate into appropriate adjustments required of (potential) employers. Students also reported feeling

empowered by these appointments, building strong connections with staff supporting them, and increasing in their confidence.

These, and other similarly positive perspectives, sit alongside an impact evaluation component which was not able, due primarily to small sample sizes, to find any statistically significant effect of the intervention on employment, wage, or job satisfaction outcomes beyond graduation. The final section in this report addresses these sample size issues, alongside making recommendations for any future evaluations of the career appointments and other similar initiatives to support disabled students.

5.1. Recommendations for future evaluations

The small sample sizes remain one of the key threats to the validity of this efficacy pilot. Addressing the previously mentioned self-selection bias with quasi-experimental evaluation approaches may be possible with larger sample sizes, but increasing sample sizes would only do so partially. Instead, future evaluations could consider understanding the motivations of students to engage with the disabled student's career appointments and their correlates in more detail, and potentially to include these in any future matching-based approaches.

Such matching-based approaches would require minimum sample sizes of engaged individuals. As the discussed above has suggested, the samples currently available for this analysis are too small for the detection of small effect sizes – this is not to suggest that the intervention may only ever have small impacts, rather it is a methodological consideration that would align any future evaluations with established practice around the evaluation of interventions in an education space.

The samples of engaged individuals should be, however, shaped by the scale of provision of the career appointments; evaluations should follow, rather than entirely dictate, the scale of intervention. In other words, evaluation may inform the scale of intervention only to the extent that evaluation efforts do not alter the intervention's change mechanisms, modes of delivery, or expected beneficiary experiences. Therefore, if the scale of intervention remains small, quantitative impact evaluations may not represent the optimal choice for ascertaining impact. Instead, in-depth detailed qualitative or mixed-methods research with beneficiaries and implementers, addressing each aspect of the theory of change may provide evidence as to the range of process and impacts the intervention may have.

A different approach to increasing sample sizes would be to continue to wait for the career appointments to be undertaken each year by another group of beneficiary students. While this would mirror the design in this report, it would need, as in this report, to be accompanied by a discussion of the limitations of using cohorts over time, especially if the circumstances around the provision of the appointments, or indeed the outcomes expected from them, were to change over time. This was the case in this

report in relation to the pandemic: carrying out the analysis with post-pandemic cohorts only would offer an insight into the current situation; this would also alleviate the risks associated with including in the analysis several cohorts with potentially large between-cohort variation without the ability (precisely due to the small sample sizes) to look at potential differential effectiveness.

Moving beyond samples, a goal of future evaluations of this, and other, interventions, would be to strengthen the causal inference. While an accepted evaluation design to achieve this would turn to experimental evaluation methods, this would raise several complex implications in the case of disability support interventions, as follows.

Most importantly, the nature and internal logic of the career appointments (with the uncapped number, open focus, person-centred approach) would seem to be at odds with attempts to randomly allocate potential beneficiaries to either receive (the treatment group) or not receive (the control group) the opportunity to engage with the career appointments. Several alternatives could instead be considered.

First, an option would be to deploy a wait-list control experimental design instead of simple treatment/control designs. In such approaches, the control group would receive the intervention, only later compared to the treatment group, with data collected at relevant time points. This would require that the outcomes being tested are hypothesised to occur in the relative short-time, so that they can be captured appropriately for both intervention and the wait-list control groups. This would remove the option of employment outcomes, wage outcomes, or any longer-term outcomes as used in this report. Given the career appointments' theory of change, relevant outcomes may instead include knowledge of disability adjustments, knowledge of employers or employment seeking strategies, and confidence and willingness to discuss disability, all short-term outputs or immediate outcomes as per the theory of change.

A second option would be to explore the opportunities afforded to evaluation designs by limitations on the scope of the intervention. As outlined above, the small number of career appointment beneficiaries is partly due to the overall arrangements with one, or more recently, a very small number of dedicated career consultants supporting disabled students. Given this, it would be possible to explore if there is demand for disabled students' career appointments that outstrips their availability; and if this is the case, to consider allocating appointments on a random basis, with those not allocated appointments receiving different forms of support that, while relevant to their disability, would not impact the same outcomes as the career appointments, at least not in the short-term, as discussed in what follows.

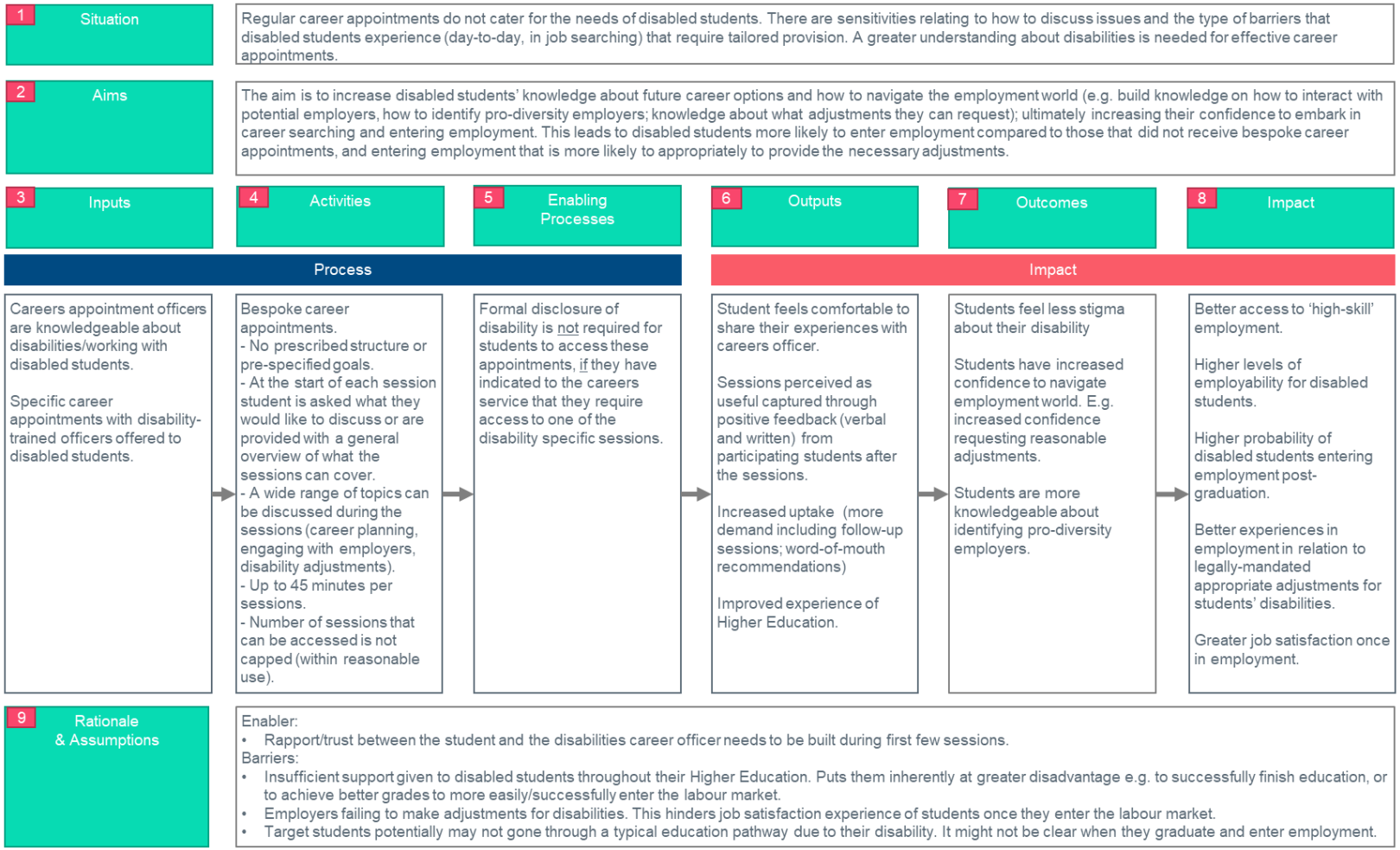
Third, a final option would be to explore the availability of data that predates the start of the intervention. This would open up opportunities for quasi-experimental approaches that do not rely on randomization yet provide stronger causal inference because in the cohorts that predate the start of the intervention, their engagement with the intervention

is impossible (by virtue of it not existing yet) and therefore unbiased by any personal characteristics (such as the motivation factors discussed above).

Future interventions would particularly benefit from these approaches, which would require planning and data collection prior to the start of an intervention's implementation. They would be supported by what, at LSE, is already a deep and sustained understanding of and engagement with relevant data, especially from administrative sources, which could be built upon to support any such evaluation design.

Ultimately, the aim of these evaluation efforts would be to ascertain further the extent to which, and how the disabled students' career appointments support beneficiaries in a range of domains, from their confidence to their employment outcomes. The present report provides some evidence towards this, and future endeavours will hopefully provide further, deeper, and more fine-grained insights.

Annex A Theory of change



Annex B Process evaluation data collection prompts

Prompts
LSE Careers is keen to develop our understanding of the experiences of students and graduates thinking about their careers. As part of this, we are interested in hearing about the experiences of people who have participated in our Disabled students' appointments. In support of this, we would very much appreciate hearing your thoughts by considering the questions set out below. You are welcome to respond to as many questions as you like, using whichever formats work best for you. You can choose to respond using more than one format if you'd like. This could include: ● responding in writing using the text boxes below, or ● with a voice note that you can upload using the "Drop files or click here to upload" option, or ● with an image ● using an alternative method that is accessible for you. Alternatively, if you would like to speak to a member of the LSE Careers team directly about your experiences, please contact Alex Free (Evaluation Manager – a.j.free@lse.ac.uk). Questions: 1. How would you describe your experience of the LSE Careers Disabled students' appointments? 2. Have these appointments made a difference to you? If so, why?

Annex C Degree award and subject

Degree award and subject	Disabled students ever engaged with career appointments (%)	Disabled students never engaged with career appointments (%)	Full sample of disabled students (%)
BA in Anthropology and Law	0	1.87	1.68
BA in Geography	10	3.36	4.03
BA in History	6.67	3.73	4.03
BA in Social Anthropology	3.33	2.24	2.35
BSc in Accounting and Finance	6.67	5.22	5.37
BSc in Actuarial Science	3.33	0.75	1.01
BSc in Business Mathematics and Stati..	10	2.24	3.02
BSc in Econometrics and Mathematical ..	0	0.75	0.67
BSc in Economic History	0	3.36	3.02
BSc in Economic History with Economics	0	0.37	0.34
BSc in Economics	3.33	7.09	6.71
BSc in Economics and Economic History	0	0.37	0.34
BSc in Economics with Economic History	0	0.37	0.34
BSc in Environment and Development	0	1.87	1.68
BSc in Environmental Policy with Econ..	0	0.37	0.34
BSc in Geography with Economics	0	1.49	1.34
BSc in Government	0	5.22	4.7
BSc in Government and Economics	6.67	2.61	3.02
BSc in Government and History	0	3.36	3.02
BSc in International Relations	0	4.85	4.36
BSc in International Relations and Hi..	3.33	2.24	2.35
BSc in International Social and Publi..	0	0.37	0.34
BSc in International Social and Publi..	0	0.37	0.34
BSc in Management	0	5.97	5.37

BSc in Mathematics and Economics	3.33	2.61	2.68
BSc in Mathematics with Economics	0	1.12	1.01
BSc in Mathematics, Statistics, and B..	0	0.37	0.34
BSc in Philosophy and Economics	3.33	3.36	3.36
BSc in Philosophy, Logic and Scientif..	3.33	1.49	1.68
BSc in Philosophy, Politics and Econo..	0	2.61	2.35
BSc in Politics and International Rel..	6.67	4.1	4.36
BSc in Politics and Philosophy	0	2.99	2.68
BSc in Social Anthropology	0	1.87	1.68
BSc in Social Policy	0	1.12	1.01
BSc in Social Policy and Criminology	3.33	0.37	0.67
BSc in Social Policy and Economics	0	0.37	0.34
BSc in Social Policy and Sociology	3.33	0.75	1.01
BSc in Social Policy with Government	3.33	2.24	2.35
BSc in Sociology	10	2.61	3.36
BSc in Statistics with Finance	0	0.75	0.67
LLB in Laws	10	10.82	`10.74
Total	100	100	100

Annex D Impact table

Outcome	**Sample size**	**Effect size** (95% confidence interval)	**Estimated 'real world' effect**	**Evaluation security** (1 = not at all secure 5 = very secure)	**Type of evidence**
Primary: Employment	165	Cohen's d -0.35 (-0.74; 0.05)	No difference in outcome between those who did and didn't receive intervention is detected, noting small samples sizes limit the sensitivity of this analysis	3.2	2/3
Primary: Wage	86	Cohen's d -0.21 (-0.71; 0.28)		2.6	2/3
Secondary: Job satisfaction	77	Cohen's d 0.67 (-0.12; 1.22)		2.2	2/3

Annex E Factor score calculation for job satisfaction secondary outcome measure

This efficacy pilot used a secondary outcome measure of 'job satisfaction', generated using data from the Graduate Outcomes (GO) survey (as administered by HESA) based on three specific questions. These tackled:

1. The extent to which the graduate's current work is meaningful (GO variable: WRKMEAN)
2. The extent to which the graduate's current work fits in with their plans for the future (GO variable: WRKONTRACK)
3. The extent to which the graduate has utilised their skills they have learnt in their studies in their form of employment (GO variable: WRKSKILLS)

Each of these questions used a 5-point (Likert) response scale. While this data is normally considered ordinal (that is, ordered response categories), it is accepted practice that, taken together, the individual items, may generate a continuous score.

This was achieved through an exploratory factor analysis approach, using the **factor** routine in Stata. This is a standard factor analysis approach, allowing (when relevant) for the extraction of correlated factors, that is, latent variables which the original observed items are measuring.

For the purposes of this report, the factor analysis was run using the full available sample (given previously mentioned non-response for these items, the total available sample was 1,243). The factor analysis employed here resulted in one single factor being extracted, with factors loadings that were moderate for the first two items and relatively lower for the third, as follows:

Variable	M(SD)	Factor loading
WRKMEAN	3.68 (1.37)	0.50
WRKONTRACK	3.54 (1.42)	0.49
WRKSKILLS	3.71 (1.32)	0.21

While the factor loading for the last item was relatively low (at 0.21), given that the aim was to explore a holistic job satisfaction outcome rather than devise a measure of job satisfaction, all three items were retained, and a continuous factor score was estimated using a regression approach. As normal in these approaches, the factor score was estimated with a mean of 0, as follows:

Variable	M(SD)	Range
Factor score	0 (0.62)	(-1.6 0.83)

This variable was then used in the secondary outcome analysis reported above.