Research protocol Leicester Race Equality Gaps Analysis

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VERSION	DATE	REASON FOR REVISION/NOTES		
Any changes to the design to be agreed between the implementation partner(s), evaluator and TASO. Note any agreed changes in the table below.				
1.2 [original]				
2.0	08 Mar 2022	Updated inclusion and exclusion criteria of modules and sample size; Updated matching results and parallel trends assumption presentation; Polished wording and added Patrick Taylor to BIT's project team.		
Pre-registration		This design has been pre-registered on the Open Science Framework.		

The QA rating system is based on the Evaluation Security tool presented in the TASO Monitoring and Evaluation Framework.¹

QA	Comments	Rating (out of 5)
Design	Matched Difference in Differences	4
Sample size	3,137 observations	4
Outcome measure	Administrative data on attainment	5
Attrition	No attrition due to use of administrative data	5
Validity	Adequate counterfactuals identified	4
Overall		

¹ https://taso.org.uk/evidence/evaluation/



1. Summary

Background

The Centre for Transforming Access and Student Outcomes in Higher Education (henceforth TASO) has funded the University of Leicester (henceforth Leicester) to develop and implement a "Decolonising the Curriculum Toolkit" (a resource for staff that provides guidelines on how to make their curriculum more racially inclusive). TASO has also commissioned the Behavioural Insights Team (henceforth BIT) to evaluate the impact of the toolkit on reducing attainment gaps between Black, Asian and Minority Ethnic (BAME) students and White students.

Aims

To evaluate how Leicester's 'Decolonising the Curriculum Toolkit' affected the attainment of BAME and White students as well as the racial attainment gap.

Intervention

The "Decolonising the Curriculum Toolkit" is a two-page resource for staff that provides clear and concise guidelines on how to make module content, assessment and teaching practice more racially inclusive and relatable for all students. The toolkit was piloted across the Sociology BA course in the 2020/21 academic year.

Design

This is a matched difference-in-differences study with repeated cross-sections. The analysis compares students' attainment trends in the modules that implemented the "Decolonising the Curriculum Toolkit" (treatment modules) with that of similarly comparable modules that did not implement the initiative.

Outcome measures

The primary outcome measure is a student's module-level attainment, and it is defined as the percentile rank of the final module mark.

Analyses

The primary analysis consists of a difference-in-differences regression, comparing module marks before and after the academic year 2019-20 (the year that curriculum reform took place) between reformed vs. matched unreformed modules. It will focus on BAME students only. The secondary analysis will repeat the primary analysis for White students. Additional descriptive line charts will be made to illustrate how the attainment gaps of reformed vs. comparator modules changed since the "Decolonising the Curriculum Toolkit" was implemented.



2. Background

This research is part of a TASO-funded project to evaluate the impact of universities' efforts to reform curricula as a means of reducing racial equality gaps in student outcomes.

2.1 Funding sources

This research is funded by TASO. TASO has funded a research assistant in University of Leicester to evaluate the impact of diversifying curricula and has commissioned BIT to deliver the quantitative evaluation of the intervention.

2.2 Team, role, and responsibility

Table 1 presents an overview of the project team. BIT's researchers will lead the design and analysis of the quasi-experimental analysis, leading in the development of the trial protocol and the analysis report. They will use GDPR-compliant administrative data provided by Leicester to investigate the effect of the curriculum reform on the attainment trends of BAME and white students.

TASO's colleagues will review BIT's proposed analytical approaches and provide comments as needed. TASO will also help facilitate the collaboration between BIT and Leicester in data and knowledge transfer related to this project (e.g. signing data sharing/processing agreement).

Leicester colleagues will share background information with BIT and help BIT address project or data related questions as needed. In addition, they will share GDPR-compliant individual-level module data with BIT and lead in the drafting of the background and intervention sections of the trial protocol and the analysis report.

Organisation	Name	Role and responsibilities
ВІТ	Dr Giulia Tagliaferri	Research lead
BIT	Dr Yihan Xu	Research analyst
BIT	Dr Alex Sutherland	Evaluation quality assurance
BIT	James Lawrence	Evaluation Supervisor and quality assurance
ВІТ	Dr Patrick Taylor	Evaluation quality assurance
TASO	Sarah Chappell	Project lead
TASO	Dr Helen Lawson	Research lead
Leicester	Dr Paul Campbell	Partner lead
Leicester	Dr Hannah Grosvenor	Partner co-investigator
Leicester	John Hurst	Partner data curator
Leicester	Clare Amess	Partner data curator

Table 1. Core	project team,	, roles and	responsibilities
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3. Aims

3.1 Research questions

The primary research question:

How did Leicester's 'Decolonising the Curriculum Toolkit' affect the attainment of BAME students?

The secondary research question:

How did Leicester's 'Decolonising the Curriculum Toolkit' affect the attainment of White students?

The exploratory research question:

How did Leicester's 'Decolonising the Curriculum Toolkit' affect the attainment gap between White and BAME students?

3.2 Research hypotheses

We hypothesise that undergraduate Sociology core modules that diversified their curricula would have smaller White/BAME attainment gaps post-intervention than comparator modules that did not diversify their curricula.

3.3 Rationale for choosing comparators

Comparator modules were chosen to establish plausible counterfactuals, for participation in the 'Decolonising the Curriculum Toolkit' initiative was voluntary for module instructors, therefore module reformation could not be (nor could be considered) randomly assigned. See Section 5.4 for details on matching methodology.

4. Intervention

4.1. Overview of the 'Decolonising the Curriculum Toolkit'

In response to a below 80% student satisfaction score in the NSS in 2018/19 for the Sociology Degree at the University of Leicester, Dr Paul Campbell designed and developed the 'Decolonising the Curriculum Toolkit' – a two-page resource for staff that provides clear and concise guidelines on how to make module content, assessment and practice more racially inclusive and relatable to students. The toolkit has the following objectives:

- Provide a set of practical guidelines to help make teaching practice more inclusive and more responsive to the student body.
- Help academics to reflect on their programmes of study, modules and cultural practices, with the aim of making the sociology curriculum more engaging and better connected to the students it serves, educates, and seeks to inspire.



• Improve student satisfaction and attainment

The toolkit was designed to improve the racial literacy of staff by providing a shorthand and accessible resource which staff can work through in their own time and with little formal training. It purposely did not provide an exhaustive and prescriptive set of instructions. Instead, it provided a host of conversational questions to prompt more meaningful reflection and strategies on how to improve their practice and racial literacy in ways which they can incorporate into their practice. This is a much more meaningful and less didactic approach for improving teaching staffs' knowledge of race and understanding how it might directly affect students' attainment and directly affect the people that the students work or live with. The toolkit provides teachingstaff an opportunity to critically reflect the role of race in the lives of students, particularly among the BAME students. That is to help them be able to better recognise, dismantle and guard against the ways in which course content, assessment and practice may make students from certain backgrounds feel marginalised, which may negatively affect their sense of belonging and widen the racial attainment gap.

4.2. Implementation of the 'Decolonising the Curriculum Toolkit'

The toolkit was piloted across three Sociology modules during the 2019/20 academic year. Data (in the form of staff testimonies) suggested that in terms of impact for fostering inclusive practice, the toolkit had been extremely effective in aiding teaching-staff to reflect on the racial inequities that might exist within their pedagogical practice or content, and improve individual's confidence to meaningfully reflect on, and take ownership of, the decolonizing process.

Against these early indicators for success, the toolkit was piloted across all modules in the Sociology BA course in the 2020/21 academic year. However, Leicester did not mandate the inclusion interventions which means that the staff can determine whether and to which extent they can engage with the toolkit.

At the end of the academic year, Dr Paul Campbell asked module convenors to give a rank score out of 10 for the level of engagement with the 'Decolonising the Curriculum Toolkit' when devising, planning and or delivering content for their module during the 2020/21 academic year. Values given were from 0 to 10 (0 = did not engage with the toolkit at all;10 = engaged with the toolkit in its entirety).

5. Design

BIT will use a matched difference-in-differences approach to evaluate the impact of the curricula reform initiative, where comparator modules will be matched to reformed modules on pre-intervention module characteristics. BIT will then compare the pre-intervention and post-intervention trend of students' attainment among the reformed modules with comparator modules that did not reform their curricula.



5.1 Module inclusion & exclusion criteria

The treated modules will be selected from the Sociology programme, whereas the comparator modules will be chosen from a pool of unreformed modules from three other programmes (Chemistry, Criminology, and Geography) that had characteristics most similar to that of the Sociology programme, as well as unreformed modules from the Sociology programme.

To maximise the comparability of modules, we will only include modules for further analysis if they met the following criteria:

- The module is not a graduate level-7 module
- The module credit is between 10~45 credits as modules with more than 45 credits typically involve a dissertation, and modules with fewer than 10 credits did not have sufficient exposure to and stake of the interventions
- Have 10 or more students enrolled in 2021
- Have at least 2 years of pre-intervention attainment data

A total of 95 modules met the above criteria. Among these, 17 were from the Sociology course which was reformed in 2020/21, while 78 were from comparator courses that were not reformed at any point of time (see **Table 2.1** for details).

Programme	Reformed status	Number of eligible modules	Compulsory modules (n, %)	Advanced modules (n, %)	Average number of students enrolled in 2021 (mean, SD)
Sociology	Yes	17	7 (41.2%)	7 (41.2%)	37.7 (21.1)
Chemistry	No	23	15 (65.2%)	12 (52.2%)	88.6 (59.3)
Criminology	No	20	9 (45.0%)	8 (40.0%)	86.3 (41.6)
Geography	No	35	13 (37.1%)	16 (45.7%)	32.3 (18.2)

Table 2.1 Number and characteristics of eligible modules by programme

5.2 Module reformed status

For Sociology modules to be considered as reformed, their intervention intensity score (as judged by the module convenor's engagement with the toolkit) should be deemed as 4 (inclusive) or higher (out of a scale of 10). The intervention intensity, according to Dr Paul Campbell's assessment, are:

 Among the 17 Sociology modules, 4 modules ("SY1021","SY2078", "SY2093", "SY3095") were rated as having an intervention intensity score of lower than 4. Those four modules were no longer counted as reformed, and together with the other 63 unreformed modules, formed a pool of comparator modules;



 Among the remaining 13 Sociology modules, three modules ("SY1005", "SY3092" and "SY3093") that had an unknown intervention intensity score were also excluded, leaving 10 modules as reformed.

In sum, a total of 10 reformed modules remained for further analysis. Among the pool of comparator modules (n = 82), 3 were excluded as the enrolled students were exclusively international, leaving a total of 79 potential comparator modules. See **Figure 3** for the detailed module selection flow.

Overall, although the general characteristics of the reformed modules were somewhat comparable to that of the pool of comparator modules, they were not sufficiently similar (see **Table 2.2**), therefore matching is needed to identify a more robust counterfactual, i.e., a comparator group.

	Reformed modules	Pool of comparator modules
Number of modules	10	79
Courses (n, %)	Sociology: 10 (100%)	Sociology: 4 (5.1%) Chemistry: 20 (25.3%) Criminology: 20 (25.3%) Geography: 35 (44.3%)
Compulsory modules (n, %)	5 (50%)	36 (45.6%)
Advanced modules (n, %)	4 (40.0%)	37 (46.8%)
Average number of enrolled students between 2018 to 2020 (mean, SD)	43.8 (22.4)	60.4 (38.0)
Average proportion of BAME students between 2018 to 2020 (mean, SD)	48.7 (4.6)	31.4 (15.3)
Average mark in percentile rank between 2018 to 2020 (mean, SD)	43.0 (6.6)	44.2 (8.5)

Table 2.2 Characteristics of eligible modules by reformed status

5.3 Module-matching procedure and results

The comparator modules will be selected from the pool of eligible comparator modules. They will be matched based on how similar they are to the reformed modules pre-intervention in the following characteristics:

- Whether module is compulsory or elective
- Whether module level is entry level (level 2 or below) or advanced level (level 3 and 4)



- Average number of enrolled students from 2018 to 2020²
- Average percentage of BAME students from 2018 to 2020
- Average attainment (percentile rank of the final module mark) among BAME students from 2018 to 2020

The matching was done using the R package Matchlt³. Each reformed module was matched based on the above-mentioned matching criteria.

The modules were assigned a propensity score, indicating the fitted likelihood that the module was reformed given its characteristics. Matching was done on a 1:1 basis, without replacement, as this is a conservative matching method which is also intuitive to interpret. The matching was done separately for each reformed module. **Table 3** presents the propensity scores of the reformed modules pairing with eight comparator modules that had the closest propensity scores.

Matched pair	Module ID	Reformed status	Propensity score
Pair 1	SY1002	Reformed	0.594
Pair 1	CR3028	Comparator	0.556
Pair 2	SY1004	Reformed	0.100
Pair 2	GY2416	Comparator	0.078
Pair 3	SY2008	Reformed	0.398
Pair 3	SY2078	Comparator	0.398
Pair 4	SY2089	Reformed	0.577
Pair 4	CR2026	Comparator	0.536
Pair 5	SY2091	Reformed	0.547
Pair 5	SY3095	Comparator	0.457
Pair 6	SY2094	Reformed	0.105
Pair 6	GY2431	Comparator	0.100
Pair 7	SY3079	Reformed	0.423
Pair 7	CR3023	Comparator	0.435
Pair 8	SY3090	Reformed	0.117
Pair 8	CR1004	Comparator	0.129
Pair 9	SY3094	Reformed	0.345

Table 3 Propensity scores of reformed vs. comparator modules

² For modules that only had two instead of three years of pre-intervention data, the average will be calculated based on the years available.

³ Ho, D. E., Imai, K., King, G., & Stuart, E. A. (2007). Matching as nonparametric preprocessing for reducing model dependence in parametric causal inference. *Political Analysis*, *15*(3), 199–236. doi: 10.1093/pan/mpl013



Pair 9	CR3030	Comparator	0.332
Pair 10	SY3098	Reformed	0.065
Pair 10	GY2432	Comparator	0.063





5.4 Visual inspection of the parallel trend assumption

We calculated BAME students' module-level weighted average attainment of the reformed and comparator modules up to 3 years prior to intervention. We then plotted the parallel trends in **Figure 3**. It appears that the trends were parallel from 2018 to 2020. In the next section, we will specify how we test the parallel trend assumption formally.





Figure 3. Trends in weighted average module mark before intervention

5.5 Formal testing of the parallel trend assumption

We used a similar regression specification⁴ as the main regression (see **Section 11**) to test whether the pre-intervention trends of module mark (percentile rank) between treatment and comparator modules were parallel.

The regression outputs showed that the trends in module mark from 2018 to 2020 of the treatment modules were not statistically different from those of the comparator modules. As a result, we think the reformed modules and the matched modules had an adequately parallel trend before the intervention.

6. Outcome measures

This study only has one outcome measure, and it is listed in the table below.

Outcome measure	Data to be collected	Point of collection
Primary outcome: Percentile ranking of final module mark	Raw final module grades for all students of the Sociology, Criminology, Chemistry and Geography modules from academic year 2017-18 to	The data is routinely collected by Leicester and will be provided by Leicester once the BIT-TASO data processing agreement and the Leicester- TASO data sharing agreement is signed.

Table 4. Outcome measures

⁴ The only difference is that for the main analysis, we interacted everTreated with a binary dummy variable (0 = before intervention; 1 = after intervention), whereas for the formal testing of the parallel trends assumption, we interacted everTreated with a four-level dummy variable (0 = year 2020, 1 = year 2018, 2 = year 2019, 3 = year 2021).

We will use percentile rank of module mark instead of the raw mark as the outcome measure for the following reasons:

- Percentile rank is less susceptible to trend, e.g., grade inflation
- Percentile rank is also less susceptible to course instructors' grading style (some instructors' 70 might be equivalent to others' 60) as the highest value (whether it is 70 or 90) will always be standardised to 100 and the lowest value will be standardised to zero, making between-module difference more objective and comparable
- Percentile is more intuitive to interpret, e.g., if BAME students' average percentile rank is 50%, it indicates zero White-BAME gap.
- Lower risk of de-identification of module instructors (See Section 12.2 for details)

On the other hand, using raw marks as the outcome measure does have some benefits as the OfS uses this metric to calculate awarding (% of students achieving first/second class honour) gaps. We acknowledge that our primary approach differs from the OfS approach, however, we think overall the benefits outweigh the risks. Furthermore, in order for the output to be better comparable to other reports in this area, we will visualise the degree awarding gap using both percentile rank and percentage of students receiving either an upper second class or a first class in the modules (see **Section 11**).

6.2 Interpretation of the outcome measure

Although the theoretical range of both the raw module mark and the percentile rank of module mark is from 0 to 100, in practice, the range of the latter is likely to be much wider than the former, because instructors seldom give raw marks higher than 80 or lower than 40.

As stated above, we will visualise the attainment gap for White and BAME students using both percentile rank and the percentage of students who achieved an upper second class and first class so that this is comparable.



7. Sample selection

7.1 Study settings

The curriculum decolonisation initiative was piloted among cohorts enrolled in Leicester's Sociology BA course. The Sociology BA is a full-time campus-based course, which has approximately 219 students of which 47.5% (104) self-describing as BAME in academic year 2020/21.

7.2 Inclusion and exclusion criteria

The sample comprises BAME and White students' final module marks (in percentile rank) of matched modules from four programmes (Sociology, Chemistry, Criminology, and Geography) in the following academic years: 2017-18, 2018-19, 2019-20, and 2020-21.

7.2.1 For modules

A total of 10 pairs (see Table 3) of successfully-paired modules were included for final analysis met the following criteria as specified in **Section 5.1**:

- The module is not a graduate level-7 module
- The module credit is between 10~45 credits, as modules with more than 45 credits typically involve a dissertation, and modules with fewer than 10 credits did not have sufficient exposure to and stake of the interventions
- Have 10 or more students enrolled in 2021
- Have at least 2 year of pre-reformed attainment data

7.2.1 For students

To minimise potential selection bias, within the included modules, we excluded module mark records of students whose:

- Ethnicity is unknown
- Fee payment status is other than the EU. This is because BAME students with such payment status are more likely to have been awarded scholarships to study in the UK and are not representative of general BAME students.

7.3 Sample size

After applying the inclusion and exclusion criteria, we are left with the following sample sizes (See **Table 5.1** for the total sample size and **Table 5.2** for the subsample of BAME students).

In total, we had 3,137 valid observations of module mark records from 2017-18 to 2020-21 and 48.6% of them belonged to BAME students. Among the total sample, about 26.7% (838 out of 3,137) of the records took place post-intervention.



Table 5.1 Sample size of all students (including BAME and White students)

Academic year	Reformed Modules		Comparator Modules	Overall	
	un-reformed	reformed	un-reformed	un-reformed	reformed
2017-18	438	-	425	863	-
2018-19	423	-	496	919	-
2019-20	278	-	239	517	-
2020-21	-	370	468	468	370
Total	1139	370	1628	2767	370

Table 5.2 Sample size of BAME students

Academic year	Reformed Modules		Comparator Modules	Ove	rall
	un-reformed	reformed	un-reformed	un-reformed	reformed
2017-18	243	-	171	414	-
2018-19	240	-	205	445	-
2019-20	134	-	122	256	-
2020-21	-	202	207	207	202
Total	617	202	705	1322	202

8. Data collection

Data was collected in two batches. The data from academic year 2017-18 to 2019-20 had already been collected and was part of the University of Leicester's institutional dataset before the kick-off meeting. The data from the academic year 2020-21 was collected by Leicester over the summer of 2021 and then provided to BIT in November 2021.

For the purpose of this study, BIT researchers received pseudonymised data only. Main data items collected are listed in **Table 6**. The data was transferred via encrypted method and also stored encrypted on BIT servers and access will be restricted to researchers directly involved in this project. All researchers' laptops



have anti-virus applications installed and encrypted hard-drives to protect data stored locally.

The code for cleaning and analysis were all quality assured at BIT. Further details of data management procedures are specified in the data sharing agreement.

Table 6. Data collection

Data item	Timeframe	Collector	Data collection status
Module reformed status and module reformed intensity, module attainment, student profiles, student fee status, module characteristics,	Academic year 2017-18 to 2020-21	Leicester	Shared with BIT in Nov 2021

9. Procedure

The high-level project plan is presented in Table 7.

Table 7. Project plan for delive

Timeframe	Action	Owner
June 2021	Kick off meetings to clarify roles & responsibilities	BIT, TASO, Leicester
Sep ~ Nov 2021	Pre-Analysis (part 1) - Agee on DSAs (June 2021) - Define scoping of research design and options (Nov	BIT, TASO, Leicester
Nov 2021	Break point and presentation of scoping ahead of full protocol development	BIT
Jan 2022	Pre-Analysis (part 2) - Draft trial protocol - Agree on draft trial protocol	BIT, TASO
End of Jan - Feb 2022	D-in-D Analysis	BIT
Mar 2022	Draft analysis report and orally present the analysis results	ВІТ

10. Power calculations

We used the following information to estimate MDES:

- Significance level: 0.05
- Power: 0.8
- Expected sample size (see Table 5.1 and Table 5.2)
- Standard error of the coefficient for treatment effects: 3.32
- Standard deviation of module mark (in percentile ranking): 28.73



• Constant used to estimate MDES: qnorm(0.975) + qnorm(0.8) = 2.80

As a result, we calculated the MDES (in percentile ranking) as $2.80^*3.32 = 9.30$. In other words, we're powered to detect a difference of 9.30 percentile rank of final module marks before vs. after intervention among BAME students. If expressed in the unit of Cohen's D, the MDES is 9.30/28.73 = 0.33, i.e. we're powered to detect a medium difference.

11. Analytical strategy

The primary analysis will focus on BAME students only, including data from the academic year 2017-18 to 2020-21. The analysis will be a difference-in-difference regression with three years of pre-intervention data points and one year of post-intervention data points. The OLS regression model is specified as follows:

$$\begin{split} Y_{imt} &= \beta_{0} + \delta \quad PostInvervention_{mt} \times EverTreated_{m} + \beta_{1}Time_{t} \ + \\ \beta_{2}EverTreated_{m} + \quad \beta_{3}Gender_{i} \ + \beta_{4}ModuleCompulsoryStatus_{m} \ + \\ \beta_{5}ModuleLevel_{m} + \epsilon_{imt} \end{split}$$

Where:

- Y_{imt} denotes the final module mark (in percentile rank) of individual *i* of module *m* in academic year *t*
- β_0 is the constant
- δ is the causal effect of interest, representing the difference in attainment trend for reformed modules in the post-treatment period(s).
 PostInvervention_{mt} = 1 if by academic year *t*, the intervention had taken place for the reformed module *m* and its matched module;
 PostInvervention_{mt} = 0 if the intervention had not by academic year *t*.
 EverTreated_m = 1 if module *m* was ever reformed; *EverTreated_m* = 0 if module *m* was never reformed.
- $Time_t$ is a set of dummies that take value from 2017-18 to 2020-21.
- Gender_i denotes the gender of participant i gender (0 = female; 1 = male).
- $ModuleCompulsoryStatus_m$ is a set of dummies that denotes whether the module is compulsory or optional.
- $ModuleLevel_m$ is a set of dummies that denotes whether the module is elementary or advanced.
- ϵ_{imt} is a robust individual-level error term.

A descriptive exploratory analysis will deduct the attainment gap between White and BAME students from the primary and secondary analysis, and the race gap results will be visualised using line charts.



12. Ethical considerations

12.1 Data protection

This study has high standards of data protection. TASO and BIT have cooperated closely with Leicester's data protection officer to ensure that this study complies with all the data protection protocols. It only uses pseudo-anonymised individual-level and module-level data. No identifiable information will be elicited from students and module instructors. Because data is fully anonymised and shared using encrypted methods, there is little risk to the students and module instructors involved in this study.

12.2 Risk of de-anonymisation

It is possible that colleagues within the participating school might be able to infer the treated modules by reading the number of enrolled students or the attainment gaps. This may cause some self-consciousness for module instructors if the modules they taught deteriorated over the years compared to other modules. To mitigate this risk, we have standardised module marks by converting the raw mark into percentile rank so that it is less straightforward to make inferences about. We have also aggregated the results at "treatment" vs. "comparator" level, further lowering the risk of individual modules being identified.

12.3 Consent

Consent is addressed through the university's standard data protection agreement with students, rather than separate consent for this study. The data will be retained for 12 months after the delivery of the final report. The agreed date for the deletion of all evaluation and research data shall be March 31st, 2023.

13.Risks

Table 8.	. Potential	risks	and	mitigation	strategies
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Risk	Mitigation strategy	Risk owner
Lower student engagement with reading materials in the academic year 2019-20 and 2020-21 due to the remote teaching mode during the pandemic	BIT will include fixed effect for academic year to control for potential effects	BIT
Data delay due to DSA/DPA signing	BIT and Leicester team will hold regular team meetings to engage relevant stakeholders	Leicester
Fail to identify matched modules	BIT will use available data to explore multiple matching strategies and proceed with the most promising one, subject to time and budget constraints	BIT