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FINAL REPORT

The Extended Project Qualification: An Opportunity for All?

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The views expressed in this report are those of the authors and all errors and omissions remain their sole responsibility.

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Table of contents

List of tables

List of figures

1. Executive summary

1.1. Background

The Extended Project Qualification (EPQ) is a project for sixth form students (typically aged 16-18 years) aimed at developing academic and project management skills by carrying out independent research on their chosen topic. It is a standalone qualification worth up to 28 UCAS points, so can contribute to entry requirements for Higher Education (HE). The EPQ was originally introduced to combat disengagement and underachievement by broadening the sixth form curriculum and promoting self-regulated, independent learning (Tomlinson, 2004). Research indicates it has many benefits; some associated with academic success in terms of benefitting both A level outcomes (Jones, 2015) and degree performance (Stephenson and Isaacs, 2019; Gill, 2017; Dilnot et al., 2022), as well as offering benefits beyond grades by developing a wider invaluable skills set. This includes developing learner agency, self-awareness and engagement, empowering students to take control of their own learning and allowing them to exercise autonomy beyond more narrow and restrictive forms of study (Stephenson & Isaacs, 2019). The EPQ further offers an opportunity to explore areas of personal interest, validate skills and competencies, improve confidence (Cripps et al., 2018), enhance general, non-subject specific skills (Williamson & Vitello, 2018) and develop independent research skills, project management and critical thinking.

While much of the previous research has focused on the benefits of the EPQ, this research instead examines the significant knowledge gaps in the geographic and demographic factors relating to the EPQ and the influence of these factors on young people's life chances. There is very limited evidence of the geographic, social and economic factors shaping which schools and colleges offer the EPQ, which students they offer it to, and which students choose to participate and complete the award. It is also noteworthy that previous large-scale studies focus on data before the education reforms which, from 2015, required students to stay in education and training until the age of 18. This research aims to address these gaps using a robust mixed methodology focused on addressing the following questions:

1. Do institutional and student characteristics (including type of school or college attended, geographical measures of deprivation, a student's prior attainment, socio-economic status, ethnicity and sex) relate to EPQ uptake and Key Stage 5 (KS5) attainment?
2. In what ways, and for which groups, has COVID-19 impacted engagement in the EPQ across 2019-2021?
3. What are the barriers to participation in the EPQ?
4. What practices help deliver good outcomes in schools and colleges which provide wide access to the EPQ?

There is ongoing policy interest in educational opportunity related to geographic inequalities (DfE, 2017, 2021; H.M. Gov, 2022). This interest aligns with recent government initiatives which focus on an 'Opportunity Mission' (H.M. Gov, 2024), aimed at breaking down the barriers to opportunity for every child, including a sustained rise in young people's school outcomes, building young people's life skills and delivery of a broad

and enriching education to provide pathways to good prospects for all. The opportunity mission aims to break the link between a child's background and their future success and to build skills for opportunity and growth. This project examines the potential of the EPQ to support this vision by specifically exploring the ability to close gaps in opportunity afforded by access to the EPQ (i.e. close the gap in provision) and the ability to realise potential benefits associated with completing an EPQ (i.e. inclusive practices creating opportunities for all students to participate and succeed, as well as targeted practices creating opportunities for disadvantaged students to participate with an equal chance of success). Given the significance of post-16 education for lifelong learning and occupational opportunities (Robinson, 2019), the research contributes to an understanding of how to narrow gaps, widen HE participation and support transitions to employment.

1.2. Methodology

The mixed methods research design included a literature review, analysis of administrative datasets, spatial mapping using Geographical Information Systems (GIS) and primary data collection (interviews and focus groups with teachers and students) and analysis. This is reflected in the structure of the report which moves from quantitative analysis of pupil-level data (academic years 2015/16–2021/22), to spatial analysis of provider-level data (2018/19), which informed the sampling of schools and colleges for the qualitative work. The research was conducted in two main phases based on the research questions (see Table 1 below).

Table 1 Overview of methodology

PHASE	METHODS	RESEARCH QUESTIONS
PHASE 1	• Literature Review • Quantitative analysis of NPD data • Geospatial analysis mapping EPQ provision in relation to measures of deprivation	1-3
PHASE 2	• Qualitative interviews with school staff involved in EPQ • Student focus groups	2-4

This work extends and updates previous research (Gill, 2017) to include an exploration of the relationship between EPQ uptake and attainment controlling for a wider range of socio-economic and demographic factors. It uses large scale administrative data spanning a seven-year period and incorporates the academic years most affected by COVID-19. As with any quantitative analysis, however, it cannot hope to explain all factors affecting performance, nor can it assert a causal relationship between EPQ uptake and HE progression. The interviews offered in-depth exploration of educators' experiences of delivering the EPQ from a carefully selected sample, using a spatially targeted approach. This allowed us to explore the benefits and challenges of taking an EPQ for students from disadvantaged geographical areas, in contrast to previous research which has given little attention to inequalities. In addition, the interviews are supported by focus groups to capture student voices which are often underrepresented in discussions around assessment.

1.3. Key findings

1.3.1. Uptake and attainment

From a seven-year period (2015/16-2021/22) using National Pupil Database (NPD) data for England involving just over 2.7 million records, we found:

- Access to, and uptake of, the EPQ is unequal; only 11% of KS5 students were awarded the EPQ across the years studied, 21% in independent schools, 15% from academies, around 13% from community/foundation, voluntary aided and free schools and just 6% in FE/sixth form colleges. It was taken by 15% of those in the least deprived areas and 6.5% of those in the most deprived areas. A greater number of females (13%) than males (9%) took the EPQ.
- Overall uptake for the EPQ is highest for those in independent schools, students in the least deprived areas, those with higher prior attainment, White students and female students.

There is considerable interest in whether the EPQ supports or undermines attainment at KS5 (Jones, 2015; Gill, 2016; Thompson, 2023) although, because the motivation to study for an EPQ is not measured, it is not possible to robustly identify the impact of the EPQ on attainment. However, controlling for background factors, it seems that:

- In terms of overall KS5 attainment, devoting time to the EPQ does not appear to undermine attainment in other subjects. Indeed, students with higher prior attainment appear to perform better at KS5 when they also take an EPQ. Even for students with the lowest levels of prior attainment, where studying the EPQ might have a slight negative impact on their KS5 grades, it could still offer additional opportunities.
- The findings suggest the EPQ is associated with a reduction in the attainment gap for boys at KS5.

In order to gain a more detailed understanding of uptake and attainment in relation to place-based measures of deprivation, a single academic year's data (2018/19) contributed to spatial analysis indicating that:

- Population-adjusted EPQ uptake was lowest (below 10%) in large urban areas, post-industrial towns and deprived coastal areas.
- The highest uptake levels (above 50%) were found in market towns, reflecting instances of localised EPQ provision (opportunity) and high participation amongst the local population.
- Providers in less deprived areas showed both higher EPQ uptake and a greater share of top grades compared to providers in more deprived areas. However, the difference in attainment levels for top grades (percentage A*/A) between the least and most deprived areas was relatively modest, at around 5–10 percentage points.

1.3.2. Barriers and practices

Teacher interview data was mostly gathered from schools and colleges located within, or in close proximity to, disadvantaged areas offering the EPQ at scale to a wide range of their students. Interview data showed that:

- Teachers perceived a broad range of barriers to EPQ uptake, retention and success, with drop out being the most important barrier to benefits associated with the award. Teachers reported that the students most at risk from dropping out were those with: low prior attainment; restricted time due to paid part time work, caring responsibilities, or long commutes; and limited cultural capital relevant to research.
- The retention of students at each stage in the EPQ is a balance between institutional resourcing and procedures, student persistence and staff motivation and skills. The cost of staffing was a significant barrier for senior leaders.
- Beneficial outcomes for the EPQ extend beyond attainment (grades) to include skills development for both students and educators. Benefits for students included reduced tariff offers by Higher Education Institutions, information literacy, lifelong learning skills and enhanced confidence and aspirations for employment or further study. Teachers benefitted from enriching professional development.
- Two broad educational approaches were reported by teachers to support retention and successful outcomes: the majority focussed on inclusive practice and developing a sense of belonging for all students taking the EPQ; a small number used targeted approaches, with practices such as writing interventions, flexible timetabling and networking with external contacts, aimed at retention and success for specific student groups.
- EPQ was prioritised where it was seen as integral to an institutional sense of belonging and student 'experience' and was important for broadening the curriculum.

1.4. Key messages and recommendations for policy and practice

1.4.1. Messages for national policymakers and stakeholders

The EPQ offers benefits to students beyond just a graded qualification, for example, improving research and critical thinking skills, non-subject specific skills and learner agency. It is viewed by many staff and students as a transformative experience. Therefore, national policymakers and stakeholders should:

- Promote the EPQ to raise awareness and recognition of its value to HE and employers.
- Support institutions to adequately resource the EPQ and to share effective practice for its delivery so that all students can participate.
- Proactively target areas of geographical deprivation that currently do not have access to the award using the **GIS Web app**. This will open the benefits of the EPQ to more students. The **GIS Web app** will also be helpful for awarding organisations, higher education institutions making contextual offers, local authorities and senior leaders of 16-19 educational establishments.

1.4.2. Messages for awarding bodies

- Educator perceptions vary about the levels of guidance they can provide to students. Clearer guidance on levels of support and the use of previous work as examples could enhance teacher confidence. Further guidance on how to support and assess creative project options would benefit providers of the award.

1.4.3. Messages for providers, educators and Higher Education Institutions

- Provide inclusive opportunities for young people to take the EPQ, regardless of prior attainment.
- Embrace and support a variety of assessment options to cultivate student creativity and sense of belonging for diverse student interests.
- With targeted support, the benefits of the EPQ can be realised for a broader group of students to ensure an opportunity for all. This might be most effective when the support addresses research literacy, specifically writing skills.
- Highlight the wider skills and employability benefits of the EPQ to all teachers, students and parents so that they understand its strategic value beyond just a grade.
- To facilitate students' choices and realistic perceptions of the strategic value of this qualification, HEIs should clearly signal whether their courses give reduced offers based on having an EPQ. Knowledge of availability of the EPQ to students (e.g. lack of EPQ provision in a geographical area) should be taken into consideration when making contextual offers.

1.4.4. Further research

- Analysis of Higher Education Statistics Agency (HESA) data for years 2015/16—2021/22 could be undertaken to explore participation and longer-term outcomes of EPQ students.
- Advanced spatial analysis methods could be employed to model EPQ opportunity and access, using travel-time catchment areas for local providers.
- Quantitative and qualitative analysis of data from EPQ centres that have chosen to close provision, or centres who do not currently offer the qualification, could be undertaken to enhance understanding of structural barriers to access.
- Conduct a quasi-experimental study to measure the impact of taking an EPQ.
- Conduct qualitative research on the opportunities afforded by the EPQ for those students who do not go into HE.

2. Introduction to the Extended Project Qualification

Qualifications taken at 16-19 are known to impact significantly on subsequent life opportunities and chances (e.g. Robinson, 2019). The Extended Project Qualification (hereafter EPQ) is an independent project completed by students of 16-19 years in schools or colleges, alongside qualifications such as A levels or a vocational qualification. The EPQ was undertaken by c. 38,700-46,600 students annually in the period of interest (2015/16-2021/22). Given the significance of post-16 education for lifelong learning and employment skills, this research is important in exploring the gaps in EPQ opportunity and whether it offers an opportunity for all. The EPQ is aimed at developing academic and project management skills by carrying out independent research on a topic of personal interest. It can be produced as a written report or in a more practical form such as an artefact or production. The EPQ is a standalone qualification worth up to 28 UCAS points, so can be used to gain access to Higher Education (HE). Some universities make a lower UCAS offer for their courses to students who achieve an EPQ.

The EPQ was originally introduced to address disengagement and underachievement through project-based learning (Working Group on 14-19 Reform, 2004). The wider benefits of taking the EPQ are reflected in findings from studies which define EPQ success more widely than simply grade outcomes. The benefits identified encompass the development of independent research and project management skills including improving synoptic learning, critical thinking, academic and core skills (Higton et al., 2012). Qualitative studies further indicated that the EPQ empowered students to take control of their own learning and exercise autonomy beyond more narrow and restrictive forms of study such as A levels (Stephenson & Isaacs, 2019). It was viewed as an opportunity to explore areas of personal interest, validate skills and competencies, improve confidence with HE application as well as raising student aspirations for specific courses or universities (Cripps et al., 2018). Williamson & Vitello (2018) found strong agreement among their sample of departmental heads in schools that the EPQ helps to enhance general, non-subject-specific skills, was good preparation for university and was good for university applications. In their work there were, however, varying perceptions of which student populations most benefited from EPQ, for example, some participants agreed it was useful across the ability range whilst others felt it was more useful for high-attaining students and few (23% of the sample of departmental heads) felt it was useful for low-attaining students (Williamson & Vitello, 2018). There were also variations in levels of access to, and support for, the EPQ - particularly by centre type - for example Takei (2021) uncovered some differing levels of access to the EPQ between state and independent schools. In some schools, Foundation Project Qualifications (FPQ) and Higher Project Qualifications (HPQ) are offered to younger pupils.

The EPQ was first assessed by awarding bodies in 2008. Currently several offer the qualification, including: AQA, Edexcel, OCR, WJEC, ASDAN and UAL. The EPQ comprises both a taught and independent component. Taught aspects include research skills, techniques to ensure effective execution of the project (such as ethics, methodology, laboratory techniques), ICT skills, project management skills, formatting of academic reports, referencing and presentation skills. A proposal and production log also form a core part of the process and the student is assigned a supervisor to oversee their work

and to assess these alongside the final report. The qualification thus comprises internal rather than external assessment, subject to a moderation process. For this reason, the EPQ is commonly termed a non-exam assessment (NEA).

2.1. Knowledge gaps

There are significant current gaps in research concerning the EPQ including:

- The geographic and demographic factors relating to access and uptake ('opportunity') to the EPQ for young people.
- The influence of institutional and student characteristics on attainment in the EPQ.
- Barriers to student participation in the EPQ.
- Teaching practices that enable good outcomes for all groups of students to succeed in the EPQ.

2.2. Aims

The study aimed to address these gaps by understanding patterns of access, participation and outcomes for the EPQ. An understanding of these factors may enable the closure of gaps in opportunity afforded by access to the EPQ (i.e. close the gap in provision) and maximise potential benefits associated with completing an EPQ (i.e. inclusive practices creating opportunities for all students to participate and succeed, as well as targeted practices creating opportunities for disadvantaged students to participate with an equal chance of success).

This research was underpinned by a comprehensive review of the literature to date. Technical terminology has been summarised in a glossary (Appendix 1). Phase one included quantitative analysis of National Pupil Database (NPD) data in order to understand if institutional and student characteristics, including type of school or college attended, measures of deprivation, socio-economic status (SES), ethnicity and sex, influence EPQ uptake and KS5 attainment. Spatial analysis was also employed, where Geographical Information Systems (GIS) were used to collate spatial data on EPQ provision to create maps of educational opportunity and to visualise this in relation to socio-economic characteristics of the local area in which schools and colleges were located.

Phase two involved focus groups with students who had just undertaken the EPQ and interviews with those who manage and teach the qualification in schools, in order to understand access, participation and success across student characteristics as well as any barriers experienced.

The research contributes to an understanding of educational opportunity, inequality and gaps in access for young people to the EPQ. It explores the extent to which the award is being used to its full potential by offering an opportunity for all.

2.3. Research questions

1. Do institutional and student characteristics (including type of school or college attended, geographical measures of deprivation, a student's prior attainment, socio-economic status, ethnicity and sex) relate to EPQ uptake and Key Stage 5 (KS5) attainment?
2. In what ways, and for which groups, has COVID-19 impacted engagement in the EPQ across 2019-2021?
3. What are the barriers to participation in the EPQ?
4. What practices help deliver good outcomes in schools/colleges which provide wide access to the EPQ?

3. Methodology

A systematic literature review was conducted prior to data collection and analysis. Spanning the period 2007-2023, a total of 136 sources which mentioned the EPQ were reviewed, comprising: academic journal articles, reports and guidance documents from exam bodies, government departments, charities and think-tanks, academic theses and articles from educational 'trade' journals.

The quantitative phase of the study involved analysis of the NPD data 2015-2022. The NPD is a longitudinal, large-scale administrative database, owned by the Department of Education (DfE), which holds a wide range of information about students who attend schools and colleges in England. It combines pupil Key Stage attainment and demographic data linked using a unique identifier for each pupil. Information on pupil characteristics include their sex, ethnicity and eligibility for free school meals (FSM), whilst school characteristics include data such as school type. More detail on the variables selected and the model used can be found in section 4.1.4.

Quantitative data was analysed to support GIS mapping and spatial analysis. This included 2018/19 open data aggregated at the provider level, covering all school/college types. Data on EPQ uptake and attainment was geolocated and analysed to produce maps of educational opportunity. The 2019 Index of Multiple Deprivation (IMD) was used to analyse how EPQ access and outcome vary in relation to the relative deprivation characteristics of the local area in which providers are located (section 4.1.7).

The GIS and spatial mapping informed the selection and recruitment of educators and students (see **Appendix 3, part 4** for full details). All state sector providers offering the EPQ with more than 25 successful entrants each year in the most deprived areas in England were identified (as measured using decile 1 Income Deprivation Affecting Children Index (IDACI) and Children and Young People (CYP) data drawn from the Index of Multiple Deprivation). All 55 providers were invited to take part in the research, resulting in 15 participating educators. Four further educators were selected purposively to include representation from large-scale providers covering wide catchments which included areas of deprivation. One further educator, from a private provider, was identified through snowball sampling and was included to offer alternative perspectives.

All the selected students attended state providers in the sample and had recently completed the EPQ award.

A total of 20 teachers were interviewed individually and asked to describe the way the EPQ was offered including barriers, successful outcomes, the impacts of the COVID-19 pandemic and how the EPQ was managed in terms of supporting students. Nineteen students participated in focus groups where they described their experiences of studying for an EPQ, challenges and barriers, effective support they had received and whether taking the EPQ had changed their aspirations or the perceived opportunities available to them. The interview and focus group data was analysed using thematic analysis (Braun & Clarke, 2006), a structured method for identifying, examining and reporting themes.

4. Findings

4.1. RQ1 Do institutional and student characteristics (including type of school or college attended, geographical measures of deprivation, a student's prior attainment, socio-economic status, ethnicity and sex) relate to EPQ uptake and KS5 attainment?

In this section a summary of the previous literature is provided and then the findings of the large-scale quantitative analysis using seven years of aggregated data from the NPD. This is followed by findings from the spatial analysis of one year of open data (2018/9) aggregated at the provider level.

4.1.1. Summary of previous research

The literature review identified 37 sources relevant to this research question. The first study in the review was from 2007, by an awarding body, which discussed the evaluation of the first cohort of students to take the pilot EPQ (Pinot de Moira, 2007a, 2007b). The most recent paper to provide quantitative analysis (Gill, 2024) is based on data prior to the COVID-19 pandemic. The 37 sources included: 15 studies with purely quantitative data published between 2014 and 2024, seven of which were published by Tim Gill from Cambridge Assessment, nine mixed methods studies published between 2007 and 2023 containing quantitative data relevant to the question and 13 qualitative studies published between 2010 and 2023.

The literature focuses on the relationship between EPQ and attainment at A level and degree level according to disadvantage, provider type and gender. There has been an increase in EPQ uptake year on year (for example, Gill, 2016; Suto & Nádas, 2012; Tremain & Pinot de Moira, 2008). Uptake was reported to be significantly higher among female students (Gill, 2017, 2022b; He & Black, 2018) and although numbers remained relatively low, there was an increase in uptake of those from disadvantaged (FSM) and minority backgrounds (He & Black, 2018). Students taking the EPQ were more likely to be high attainers, have low levels of deprivation, speak English as a first language, attend a girl's school and attend independent or selective schools Gill (2022b). Other studies also reflected a notable increase in uptake in the independent sector (e.g. Tinsley & Doležal, 2019; He & Black, 2018).

Overall, the data in the quantitative studies showed that the EPQ is associated with better A level outcomes and enhances performance, often beyond expectations, accounting for prior attainment. EPQ students were found to perform better than those doing A levels alone (Stoten, 2014) and were 29% more likely to achieve an A* to B at A level (Jones, 2016). They gained higher average UCAS points and had more qualifications (Gill, 2017), although overall the effect was small at both the student and centre level. The students undertaking an EPQ gained a higher UCAS tariff roughly equivalent to 5-6 points, or one UCAS grade, if taking 4 A levels. Females were reported to outperform males but interestingly the 'EPQ effect' was greater for male students (Gill, 2017). Sex was found to correlate better with EPQ grade than other factors (He & Black, 2018). In terms of EPQ attainment there were also school differences with independent schools achieving the highest grades (32.6% A*, 60% A or above), followed by grammar schools (20.5% A*, 46.1% A or above). Secondary modern schools were the lowest achieving and had the most withdrawal rates (12.9%) compared to the lowest in grammar schools (1.7%) with only one other sector (FE) having withdrawal rates above 5%. Gill (2017) reported that students attending FE/tertiary colleges had the greatest improvement in performance from taking the EPQ, compared with not taking it.

Whilst not the focus of the current study, it is noteworthy that there is significant evidence that taking an EPQ is associated with progression to HE and degree level outcomes (Dilnot et al, 2022; Gill, 2024; Gill & Rodeiro, 2014; Hillman, 2014). There was even a positive effect of taking the EPQ and achieving an X (which means a result was not issued) rather than not taking it at all, so starting despite not completing was still beneficial (Gill, 2024). The underlying assumption in the papers linking EPQ uptake and attainment with HE attendance and outcomes is that the project enables students to develop the key research skills that are necessary for university and as preparation for undergraduate work (Dilnot et al., 2022; Gill, 2018).

4.1.2. Knowledge gap

The literature identified gaps since, overall, few studies specifically refer to outcomes dependent on EPQ uptake by institutional and student characteristics. Furthermore, previous large-scale studies focus on data before the education reforms which, from 2015, required students to stay in education and training until the age of 18. Earlier studies are therefore less likely to capture students who would have left school at age 16 and may not have had the opportunity to study the EPQ.

This study does so by looking for differences in KS5 outcomes by student characteristics including type of school or college attended, geographical measures of deprivation, a student's prior attainment, socio-economic status (SES), ethnicity and sex. Firstly, in this section the descriptive statistics related to these variables will be described. A multilevel model is then outlined. This is used to investigate whether taking an EPQ has an independent relationship with mean KS5 scores across all qualifications taken when controlling for Key Stage 4 (KS4) attainment, SES, ethnicity and gender. The use of modelling with a large administrative dataset and across multiple years (2015/16-2021/22) makes a unique and valuable contribution to the knowledge gap on the EPQ.

Current analysis will not however be able to address all gaps since it is not possible to capture selection and motivational effects due to the nature of the data. As suggested in much of the literature cited in relation to this research question, it is difficult to know if the skills developed by the EPQ per se contribute to the value-added A level performance or whether the EPQ acts as a proxy for a confounding variable. For example, do EPQ students tend to be more motivated and does this account for differential performance? Modelling techniques only allow the reporting of such associations and these may not be causal (see Dilnot et al., 2022; Gill, 2017). Qualitative studies also highlight that the mechanisms underlying the EPQ effect remain unclear, with more exploration needed before causation can be inferred (Stephenson & Isaacs, 2019).

4.1.3. Data description - The National Pupil Database

Data from the NPD was used to address RQ1 and RQ2. The NPD is a wide-ranging dataset that contains information about students who attend schools and colleges in England. In addition to school census information, it includes national examination results. This data was used for the quantitative analysis of KS5 grade outcomes contrasting students who are awarded an EPQ grade with those that are not. Two thirds of the students in our KS5 sample had the equivalent of three A level awards but the data available for the quantitative analysis included students studying a wide range of level 3 qualifications. The data was derived from the NPD KS5 examination and student datasets for the academic years 2015/16 to 2021/22. This represented 2,705,640 students from England, some of whom were removed from the subsequent analysis because of missing values.

4.1.4. The variables and missing data

The paragraphs below describe the information that was available for each student and include definitions of the format of each variable in subsequent modelling.

4.1.4.1. Mean Key Stage 5 score

Mean KS5 score was calculated using a mean of the awarded points gained from each KS5 qualification a student entered[1]. This mean included points for A levels, BTECs and other vocational qualifications. The mean did not include points gained from an EPQ. All points were expressed on a scale equivalent to a single A level even though the calculation included a wide range of level 3 qualifications, some of which were double, and even triple, awards. Nearly two thirds of the students had the equivalent of three A level awards. Where a student had entered for the same qualification on more than one occasion the most recent points were used. Mean KS5 score was used as the continuous dependent variable in the subsequent analysis.

4.1.4.2. EPQ uptake

EPQ uptake was defined as a three-level categorical variable with the baseline category that a student had not entered an EPQ. Alternatively, the students were classified as

[1] For example, in the case of an A level, grade E is awarded 18 points and there is an eight-point increment with each successive grade, up to the maximum point score for an A level grade A* of 56.

having been certificated for an EPQ in the same year as entering the majority of their KS5 qualifications or having entered in an earlier year. It was not possible to see the precise entry point in the academic year for the EPQ in the dataset and therefore it was not possible to investigate selection effects.

Over the seven years of interest, just over 11% of students entered for an EPQ and of these 90% made their entries in the same year as the majority of their KS5 qualifications (see Table 2). In schools and colleges where it was offered the EPQ was not taken by 86% of students. Furthermore, 2.7% of KS5 students attended schools or colleges where it was not offered. These figures suggest it does not present an opportunity for all. There was a small increase in entry rate up until the year 2020/21 but then entries dipped in 2021/22, perhaps due to the impact of increased teacher assessed project work in the COVID-19 years (see RQ2).

A small proportion of the entries (1.6%) were awarded a grade U and a further 1.9% were awarded a grade X. A grade X is recorded where there is an entry, but the student did not complete the requirements of the EPQ. These students were included as part of the EPQ cohort in recognition that they had probably attended at least some of the taught elements of the course. By including them, there is the assumption that the experience of these students was more aligned with those who were graded than with those who were formally withdrawn from the EPQ. On the other hand, it is important to note that receiving an EPQ grade is not equivalent to engaging in the process of creating an extended project. There will also be students who do not submit - they may withdraw themselves or be withdrawn by the provider - but may still benefit (or otherwise) from the EPQ process. All the findings from the quantitative analysis should be contextualised within the wider framework of EPQ uptake, opportunity and engagement.

Table 2 EPQ uptake statistics

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	All Years
% of students awarded an EPQ grade	9.7	10.5	11.9	12.5	12.3	12.3	10.6	11.3
% of EPQ students awarded an EPQ grade in the same year as other KS5 qualifications	91.3	91.9	90.1	87.3	89.4	90.7	89.6	90.0
% of EPQ students awarded an EPQ grade in an earlier year than other KS5 qualifications	8.7	8.1	9.9	12.7	10.6	9.3	10.4	10.0
% of students not taking an EPQ when the provider offered the qualification	87.3	86.7	85.4	85.0	85.2	85.1	86.9	86.0
% of students attending a provider that did not offer the EPQ	3.1	2.9	2.8	2.5	2.5	2.6	2.5	2.7

4.1.4.3. School or college type

School or college type was defined as a categorical variable with the baseline category of academies. The granular type-of-establishment code in the NPD provides a detailed classification of schools and colleges. These were grouped into six broader categories which were defined as academies, community & foundation, free, voluntary aided/ controlled, FE/sixth form colleges, independent and other. Where the type of establishment was missing it was coded unknown to allow inclusion of the student in subsequent analysis.

Table 3 shows the distribution of EPQ uptake across establishment types, the percentage of students taking an EPQ within the establishments and the mean KS5 score of all their students. Uptake of the EPQ is highest in the independent schools and lowest in FE/sixth form colleges. Along with having the highest uptake the independent schools also have students with the highest mean KS5 attainment, followed by students in academies, with FE/sixth form college students attaining the lowest mean KS5 scores.

Table 3 Distribution of all KS5 students across establishment type, percentage EPQ uptake and mean KS5 score for all students

Establishment Type	Academy	Community/ Foundation	Free	Voluntary Aided/ Controlled	FE/Sixth Form Colleges	Independent	Other	Unknown
% of KS5 cohort	34.5	6.9	0.6	3.8	42.4	9.2	0.1	2.4
% EPQ uptake	14.8	13.1	13.7	12.9	6.4	20.7	21.6	3.1
Mean KS5 Score	36.4	34.8	34.4	36.2	32.6	44.0	33.1	32.1

4.1.4.4. Income Deprivation Affecting Children Index (IDACI)

IDACI[2] was reported in deciles where decile 1 represents children living in the most disadvantaged areas and decile 10, those living in the least disadvantaged areas. IDACI was matched to the NPD data at small local area level (known as lower layer super output areas - LSOAs) using student postcode. This variable therefore provides a measure of the level of deprivation experienced by children in the area and is created from a subset of the 2019 income deprivation measures. Student postcode was only available from 2017/18 onwards and from establishments mandated to complete the school census. Therefore, no IDACI data was available for 2015/16, 2016/17 and for students from independent schools. Where students attended independent schools IDACI was left as missing but, for other students where this variable was missing, an 11th category was added and coded as unknown. The variable was centred round the 5th decile in subsequent analysis and so the 5th decile, representing a student living in an area of median deprivation, was the baseline category. Students from less deprived areas had higher uptake of the EPQ and achieved a higher mean KS5 score compared to those in more deprived areas as shown in Table 4.

[2] IDACI & IMD (see also section 4.1.7.1) are measures of deprivation produced as part of a suite of deprivation indices by the Ministry of Housing, Communities and Government. More information can be found at: https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019

Table 4 Distribution of all KS5 students across the IDACI deciles, EPQ uptake and the mean KS5 score for all students (decile 1 describes the most deprived students and decile 10, the least deprived)

IDACI Decile	1	2	3	4	5	6	7	8	9	10	Unknown
% of KS5 cohort	7.8	8.9	8.6	8.7	8.6	8.7	8.9	9.2	9.5	10.0	11.3
% EPQ uptake	6.5	7.2	8.1	9.1	10.1	11.1	12.1	13.0	13.8	14.9	20.6
Mean KS5 Score	31.6	32.3	32.9	33.6	34.3	34.9	35.5	36.2	36.8	38.0	36.2

4.1.4.5. Free school meals

FSM was also included as a common measure of deprivation and was defined as a categorical variable with the baseline category including students not eligible for FSM. Only 8% of students in our KS5 sample had previously been eligible for FSM at Key Stage 4.

4.1.4.6. Prior attainment

Prior attainment was included in the analysis as a crude measure of candidate ability. It was calculated using the KS4 grades included in the KS5 dataset and based on the method that is applied by the DfE to create the value-added data. The squared prior attainment score was also used in the subsequent analysis. A non-linear relationship between prior attainment and KS5 outcome might be expected because of the selective nature of the KS5 entry; very few students will have low measures of prior attainment. Because the KS5 students entered for a range of academic and vocational qualifications, there were students with a wide range of prior attainment scores. Table 5 shows that EPQ uptake was low for students with prior attainment scores under 4 but increased with prior attainment. Uptake dropped slightly for the relatively few students with the highest prior attainment scores.

Table 5 Distribution of all KS5 students across rounded prior attainment scores and EPQ uptake

KS4 score (grade)	3 or lower	4	5	6	7	8	9 or higher
% of KS5 cohort	16.5	20.3	20.7	16.8	13.3	8.5	3.9
% EPQ uptake	2.5	5.7	10.0	15.4	20.3	24.1	21.5

4.1.4.7. Ethnicity

Ethnicity was defined as a categorical variable with the baseline category of White. The granular ethnicity code in the NPD provides a detailed classification of ethnicity. These were grouped into five broader categories based on the main category codes required for use by schools and colleges when completing the school census. The categories were defined as White, Asian/Asian British, Black/Black British, Mixed and Other. Where ethnicity was missing it was coded as Unknown/Undisclosed to allow inclusion of the student in subsequent analysis. Data excludes students from the academic year 2015/16 because no ethnicity information was available for this cohort.

Table 6 presents the ethnic proportion of students in the KS5 sample, uptake of the EPQ and their respective mean KS5 score. There was a higher percentage of White students taking the EPQ but this was only marginally more than Asian/Asian British students and those of mixed ethnicity. There was a smaller percentage of Black/Black British students taking the EPQ and they had the lowest mean KS5 score.

Table 6 Distribution of all KS5 students across the ethnicity categories, EPQ uptake and the mean KS5 score for all students

Ethnicity	White	Asian/Asian British	Black/Black British	Mixed	Other	Unknown/ Undisclosed
% of KS5 cohort	62.8	13.1	5.6	2.6	1.7	14.3
% EPQ uptake	11.1	10.2	7.7	10.2	8.6	17.6
Mean KS5 Score	34.8	34.9	31.1	34.0	34.1	37.3

4.1.4.8. Sex

Sex was defined as a binary variable with female as the baseline category. The mean KS5 score for female students was 36.6 and for their male counterparts it was 33.8. In terms of entry to higher education, this difference of nearly three points is roughly equivalent to an advantage of one grade over a set of three A levels. EPQ uptake was greater for females than males (see Table 7).

Table 7 Proportion of students taking the EPQ annually by sex

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2022/22	All years
% taken Female	11.1	12.0	13.6	14.4	14.4	14.4	12.7	13.2
% taken Male	8.1	8.7	10.0	10.4	10.1	10.0	8.4	9.3

4.1.4.9. Missing data

For all students, the KS5 grade outcome data was complete but, for some students, the characteristics data was missing. Ethnicity data was unavailable for the 2015/16 academic year. Postcode data was unavailable in the years 2015/16 and 2016/17 and hence it was impossible to match IDACI, the key socio-economic indicator. IDACI was also unavailable for all independent schools and while it would have been possible to code IDACI as unknown for all independent students, this would have led to confounding in any subsequent model. Therefore, in order to understand the interrelationships between EPQ uptake and student characteristics, it was necessary to omit data from 2015/16, 2016/17 and from all those attending fee paying schools. This left a dataset of 1,723,598 individual records available for subsequent analysis.

4.1.5. The Model

Our KS5 assessment data forms a natural hierarchy with students nested within their school or college. Therefore, a two-level linear multilevel model was fitted to the data with mean KS5 score as the continuous dependent variable. The models were fitted using the lme4 package for R (Bates et al, 2015).

The independent variables, discussed above, were included in the model on the basis of potential educational significance rather than statistical significance. Moreover, the large volume of KS5 data means that very small differences in mean KS5 score - which might be of statistical interest - are of no educational interest; in other words, the differences are such that they afford no material advantage (or disadvantage) to a given group of students. Given the limitations of significance testing evidence, the effect size of each independent variable was also calculated. Effect sizes are presented with reference to the wider context of entry to further education and so, where possible, the parameter estimates are roughly transformed to illustrate the likely impact for a notional candidate taking three A levels.

Both RQ1 and RQ2 focus particularly on the relationships between EPQ uptake and other student characteristics. For this reason, the model includes a full set of two-way interactions between the EPQ categorical variable and the other independent variables. The structure allows an assessment of the impact of EPQ uptake on KS5 outcome dependent on the socio-demographic characteristics of students.

The full fitted model is described in Table 10 (Appendix 2.3) which includes the parameter estimates and effect sizes for all independent variables. The parameter estimates describe the difference in KS5 score between a student with a given characteristic and those with a baseline set of characteristics. We have defined a baseline student as a student who has an average prior attainment score; they are female, White and attend an academy; they have a median deprivation score and do not receive FSM. They entered for their KS5 examinations in a non-COVID-19 year. The Table 10 also includes a column which ranks the magnitude of effect size, with a rank of 1 being the greatest effect.

The main effects described below measure the relationship between a given independent variable and the dependent variable (mean KS5 score). The interactional effects, described subsequently, measure the simultaneous effect of two independent variables on the dependent variable.

4.1.5.1. Main effects

The model showed four main effect variables (prior attainment, ethnicity, sex and COVID-19; the latter will be discussed in section 4.2) with a potentially educationally significant effect size (emboldened on Table 10, Appendix 2.3). Of these, prior attainment was by far the most dominant. Whilst these main effects are not specifically pertinent to RQ1 and RQ2, for completeness they are discussed below as they provide a background to the factors influencing KS5 performance.

4.1.5.2. Prior attainment

The model showed that a one standard deviation increase in prior attainment score was associated with a 10 point increase in mean KS5 score. In other words, a one GCSE grade increase in the prior attainment measure gives rise to a 4.2 point, or approximate half grade, increase in mean KS5 grade outcome.

4.1.5.3. Ethnicity

When all other variables were controlled, Black and Black British students gained an average of 1.3 fewer mean KS5 points compared with their White counterparts.

4.1.5.4. Sex

When all other variables were controlled, the extent to which female students outperformed their male counterparts was moderated and the difference of three KS5 points seen in the raw data narrowed to 1.5 KS5 points.

4.1.5.5. EPQ uptake

Of importance in terms of RQ1, however, is the fact that the main effect size associated with taking the EPQ either in the same year as KS5 qualifications or in an earlier year was negligible. In other words, regardless of timing, the EPQ appeared to confer no blanket advantage in terms of improvement in mean KS5 scores and, by extension, progression to higher education.

4.1.5.6. Interactional effects

On the other hand, there is some evidence to suggest that EPQ may have affected performance in some subgroups of the KS5 population. The three interactions with EPQ uptake that had the highest effect size are discussed in order of relative importance.[3]

The Interaction effects are presented as interaction plots, where the x-axis describes one of the two independent variables, the y-axis describes the dependent variable (mean KS5 score) and each line represents a different level of the second independent variable. If the lines on the interaction plot are parallel, then there is no interaction between the factors. If the lines intersect, converge or diverge then it is likely there is an interaction effect.

4.1.5.7. EPQ and educational establishment

The evidence suggested that students from FE or sixth form colleges gained very similar mean KS5 scores to those entered through academies if they were entered for an EPQ in their final year, or they were not entered for an EPQ (see Figure 1).

However, if the FE and sixth form college students entered for the EPQ in an earlier year, they performed more poorly, gaining 1.9 fewer KS5 points. In terms of entry to higher education, such a difference would equate to being awarded three quarters of a grade less on one of three A levels than equivalent academy students. FE and sixth form colleges are for aged 16-19 education. Students from these establishments who enter the EPQ early will have been studying in the new environment for less than a year. It is possible that the distraction of an EPQ coupled with a lack of familiarity in the setting might have combined to detract from future KS5 performance.

[3] Note that there were a small number of other interactions with larger effect sizes but these interactions were all for catch-all categories where student data was imputed, for example, FSM (Unknown). The potentially broad nature of students in these categories makes interpretation of educational significance in these circumstances complex and so they are not discussed further.

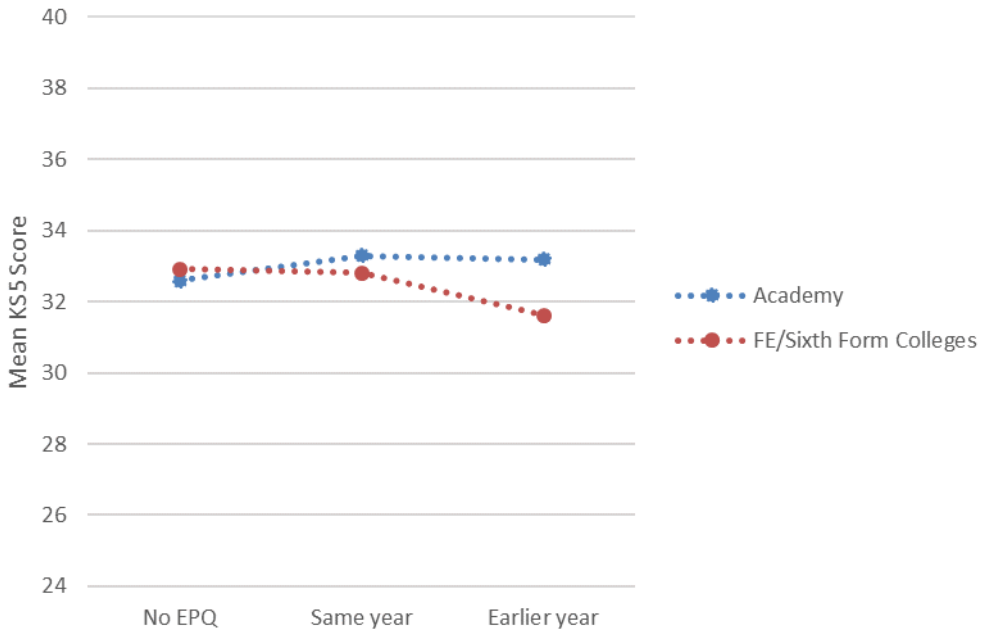


Figure 1 The interaction between EPQ uptake and type of establishment

4.1.5.8. EPQ and student sex

The gap between male and female students appeared to be further narrowed by entry to the EPQ (Figure 2). Where a male student took an EPQ in the same year as their KS5 examinations, the difference between male and female students dropped to 0.3 KS5 points. The benefit was even felt when the EPQ was taken in an earlier year where the gap was 0.6 KS5 points. Though interesting as a finding, it would be unwise to suggest that the EPQ boosts the KS5 performance of male students. It is equally likely that the male students who enter for the EPQ are a self-selecting and more highly motivated cohort.

4.1.5.9. EPQ and prior attainment

The final noteworthy interaction was that between prior attainment and EPQ uptake. Figure 3 illustrates this interaction for the 88% of students with prior attainment scores in the range ±1 standard deviation of the mean. In other words, students with mean GCSE (or equivalent) between 2.9 and 7.7. For all but the least able students, taking an EPQ was associated with a higher mean KS5 score and there seemed to be no difference in outcome dependent on when the EPQ was taken. Once again, however, it is impossible to disentangle this effect from any differing levels of motivation between those choosing to enter an EPQ and those opting out. At the lower end of the ability scale, entering for an EPQ seemed to be slightly detrimental to KS5 performance, perhaps acting as a distractor to the other areas of study. The crossover point on the graph in Figure 3 is at about 0.5 standard deviations below the mean. 21% of the students in our sample fell below this threshold. All these students had a mean GCSE (prior attainment measure) of less than 4.1.

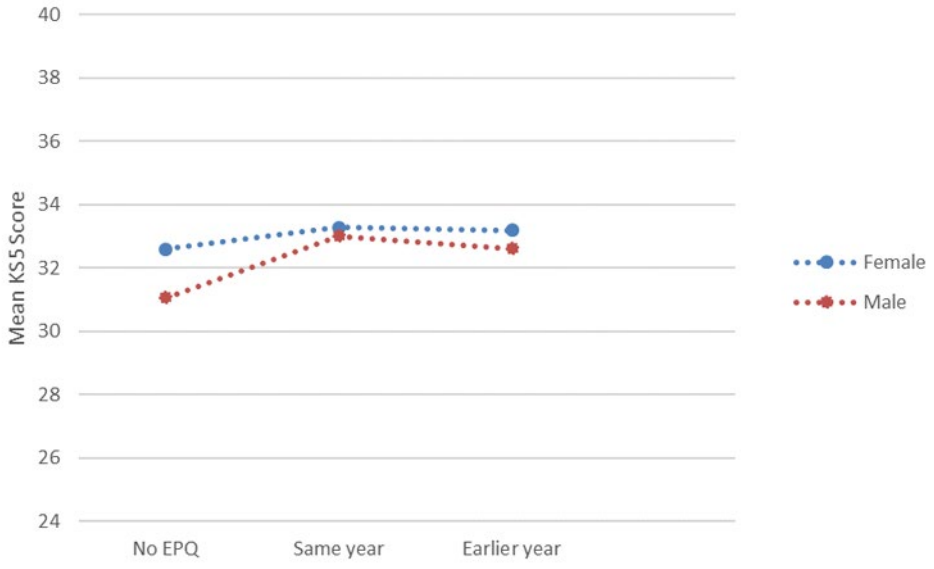


Figure 2 The interaction between EPQ uptake and student sex

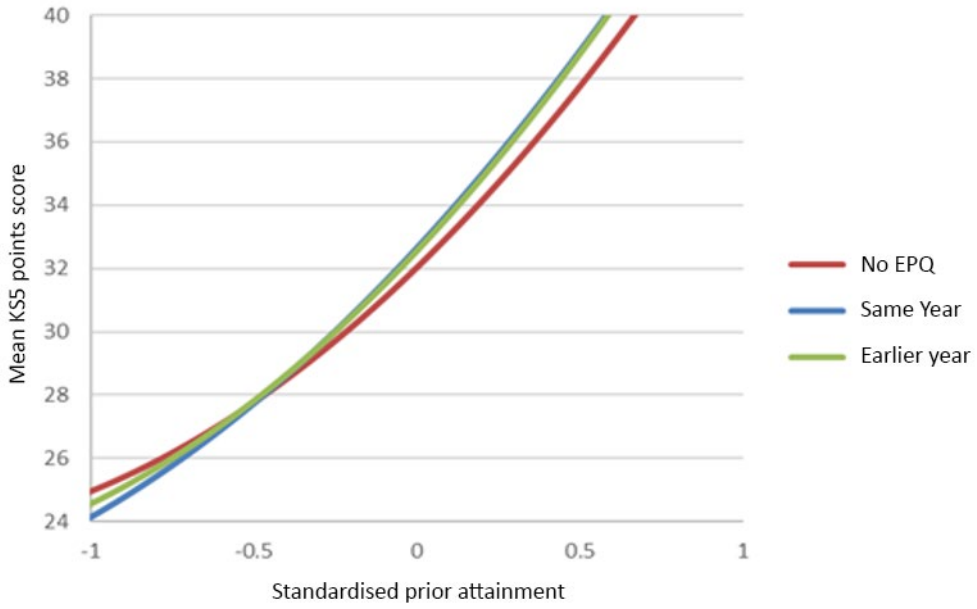


Figure 3 The interaction between EPQ uptake and prior attainment

The effect size associated with all other interactions included in the model was low, both in a statistical and educational sense. At most, for these interactions, the positive (or negative) impact of taking an EPQ was equivalent to less than half a grade on one of three A levels.

4.1.6. Conclusions

- Uptake for the EPQ is highest for those in independent schools, students in the least deprived areas, those with higher prior attainment, White students and female students.
- In terms of overall KS5 attainment, devoting time to the EPQ does not disadvantage students. Indeed, students with higher prior attainment appear to perform better at KS5 when they also take an EPQ. However, because the motivation for EPQ uptake is

not measurable, it is not possible to capture the mechanism that led to this improved KS5 performance. Even for students with the lowest levels of prior attainment, where studying the EPQ might have a slight negative impact on their KS5 grades, it could still offer additional opportunities.

- The EPQ reduces the attainment gap between boys and girls at KS5.

These findings broadly align with the previous literature that EPQ students perform better than those doing A levels alone (Stoten, 2014), gain a higher UCAS tariff and, whilst females outperform their male counterparts, the 'EPQ effect' was greater for male students (Gill, 2017).

4.1.7. Provider level analysis

4.1.7.1. Data description and methodology

The spatial nature of EPQ uptake, attainment and disadvantage, was analysed at provider level using publicly available data for 2018/19 sourced from the DfE (Compare school and college performance and Get information about schools). The data was geolocated in a GIS, along with open data from the Ordnance Survey ("Boundary-Line" and "OS Open Built-Up Areas"). The 2019 Index of Multiple Deprivation (IMD)[2] at Middle Layer Super Output Area (MSOA) level was used to explore the relationship between EPQ uptake, attainment and relative deprivation.

Map outputs from the research are available to explore interactively via a **GIS web app** (Figure 4).

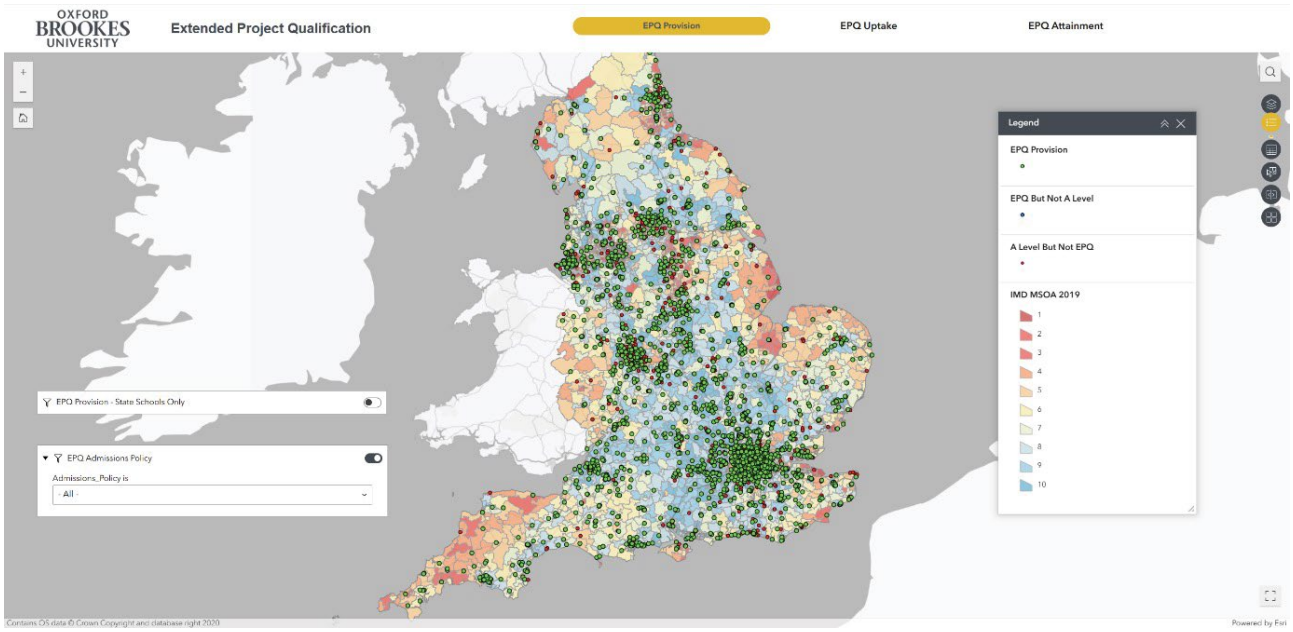


Figure 4 Extended Project Qualification GIS web app

Kernel density estimate (KDE) analysis was used to model and map the density of EPQ uptake across England (see **Appendix 3, part 2** for full details). To reduce the confounding effect of large urban areas, values for population-adjusted EPQ uptake were calculated. In other words, the number of recorded EPQ entries was expressed as a percentage of all Year 13 students that entered for at least one advanced (level 3) academic qualification

across all schools and colleges in the area offering 16-18 education (including those not offering the EPQ). KDE analysis was performed for EPQ entrants from state sector providers only and for all providers combined (i.e. including independent schools). Therefore, the accompanying maps show EPQ uptake expressed as a percentage of the population of Year 13 students, clipped to the outline of built-up areas.

To examine the relationship between EPQ uptake and relative deprivation, GIS overlay was used to determine the number of EPQ entrants within IMD MSOAs and the results were collated and analysed using MSOA deciles, where decile 1 is the most deprived and decile 10 the least deprived.

Analysis of attainment by grade outcomes was performed for 1,232 state sector providers where schools or colleges entered 6 or more students. Data is suppressed for schools or colleges with five or fewer entrants. KDE analysis was used to model attainment density for top grade outcomes (A*/A) using: (i) the raw number of A*/A grades achieved and (ii) the % of the provider cohort gaining an A*/A, where the density values show the equivalent number of students per Km^2. Finally, the relationship between EPQ attainment and relative deprivation was analysed.

Analysis by delivery model (i.e. whether the EPQ is compulsory, optional, or selectively offered) was not possible due to a lack of available data on institutional policies.

4.1.7.2. Geographic characteristics of EPQ uptake

Figure 6(a) maps the population adjusted EPQ uptake for 2018/19 in state sector provision, from which three broad patterns can be observed.

Firstly, lower levels of uptake (i.e. 0-5% or 5-10%) are prevalent in major urban conurbations (e.g. Greater London, Birmingham, Greater Manchester and Tyneside), with similar values in many post-industrial towns (e.g. Stoke-on-Trent, Mansfield, Sheffield, Doncaster, Bradford and Wakefield). Deprived coastal areas also show consistently low uptake - along the south coast (e.g. Bognor Regis, Hastings and Folkestone), the east coast (e.g. Felixstowe, Great Yarmouth, Cleethorpes, Kingston upon Hull, Hartlepool and Sunderland), parts of the north-west coast (e.g. Barrow-in-Furness, Blackpool and Southport) and the south-west (e.g. Weston-Super-Mare, Minehead and Barnstaple).

Secondly, outside London a semi-contiguous band of moderate uptake (10-20%) exists across the Home Counties, rising to peak values in the range 33-40% (e.g. Virginia Water in Surrey; and Beaconsfield and Amersham in Buckinghamshire). Several locations with a strong university presence can also be identified as distinct pockets of higher EPQ uptake, notably Cambridge (c.30%), Canterbury (c.34%) and the Oxford hinterland (Kidlington, Witney and Banbury c.34-55%).

Thirdly, fine-scale ‘hot spots’ of EPQ uptake can be identified in selected market towns e.g. Salisbury and Wells (Southwest), Horncastle and Southwell (East Midlands), Thirsk and Todmorden (Yorkshire & Humber) and Hexham and Berwick-upon-Tweed (Northeast). These hot spots reflect local concentrations of schools/colleges offering the EPQ combined with elevated levels of participation amongst the local student population. For example, Newport

in Shropshire - a small rural town with a population of around 14,000 - has 2 state providers delivering the EPQ at scale, resulting in a population-adjusted uptake exceeding 75% of all Year 13 students.

The inclusion of independent schools in Figure 6(b) has a minimal effect on the population adjusted EPQ uptake, reflecting that c.93.5% of the Year 13 cohort for 2018/19 was educated in the state sector. In Greater London the inclusion of independent schools in the data leads to an increase in the spatial extent of the area within the 5-10% category for population adjusted EPQ uptake, whilst in Cheltenham, independent schools raise the calculated value by c.7%. However, the inclusion of independent schools in the data can also serve to reduce the values for population adjusted EPQ uptake (e.g. by adding Year 13 students for schools that do not offer the EPQ). For example, in south Cambridge the population adjusted EPQ uptake drops by around 6% when the independent sector is included, whilst in Carlisle the figure drops by around 7.5%.

4.1.7.3. EPQ uptake and deprivation analysis

Open data that defines catchment areas and admissions policy is not available to determine the spatial socioeconomic characteristics of the potential student population and the aggregated provider-level data does not contain students' residential location. As a proxy, GIS overlay was used to determine the Middle Layer Super Output Area (MSOA) in which the provider is located. MSOAs typically contain between 2,000 and 6,000 households and a population of 5,000 to 15,000 people and were used to characterise the proximal community served by the provider. Index of Multiple Deprivation (IMD) deciles for MSOAs were then determined, along with the number of EPQ entrants.

Figure 5 clearly shows that the number of students taking the EPQ in schools/colleges located in more deprived areas (lower deciles) is markedly less than in the least deprived areas (higher deciles). Whilst state providers dominate EPQ uptake, the contribution of independent schools becomes more pronounced in higher deciles, especially in deciles 8 to 10.

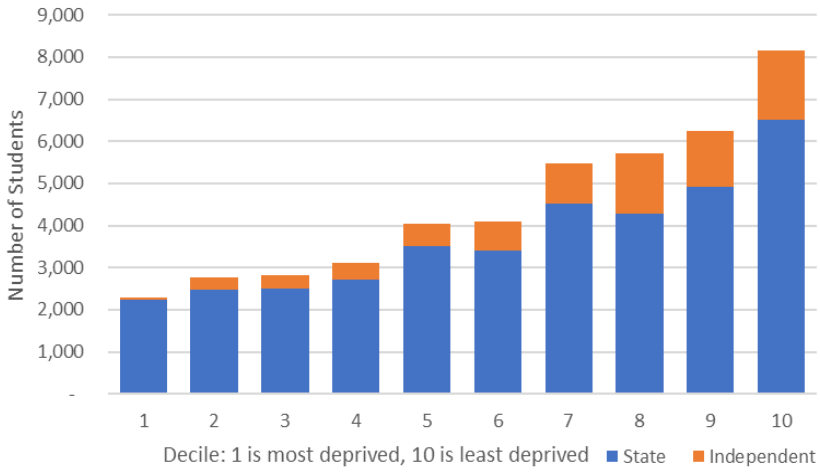
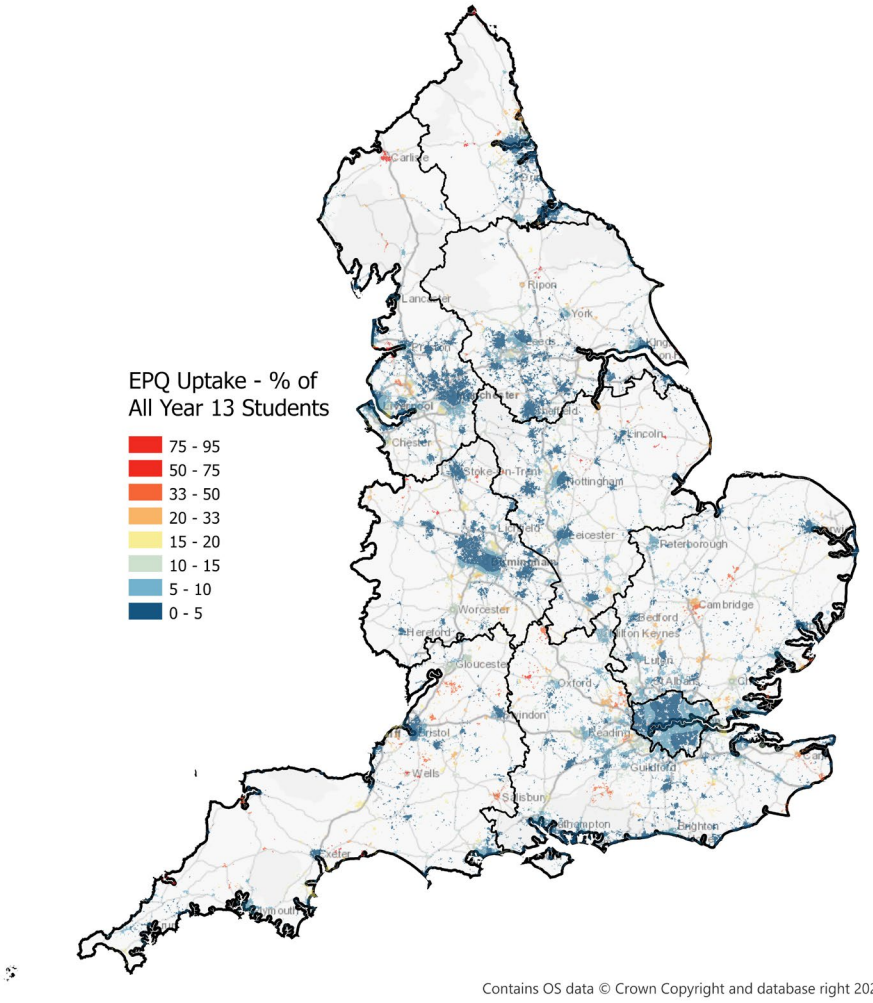
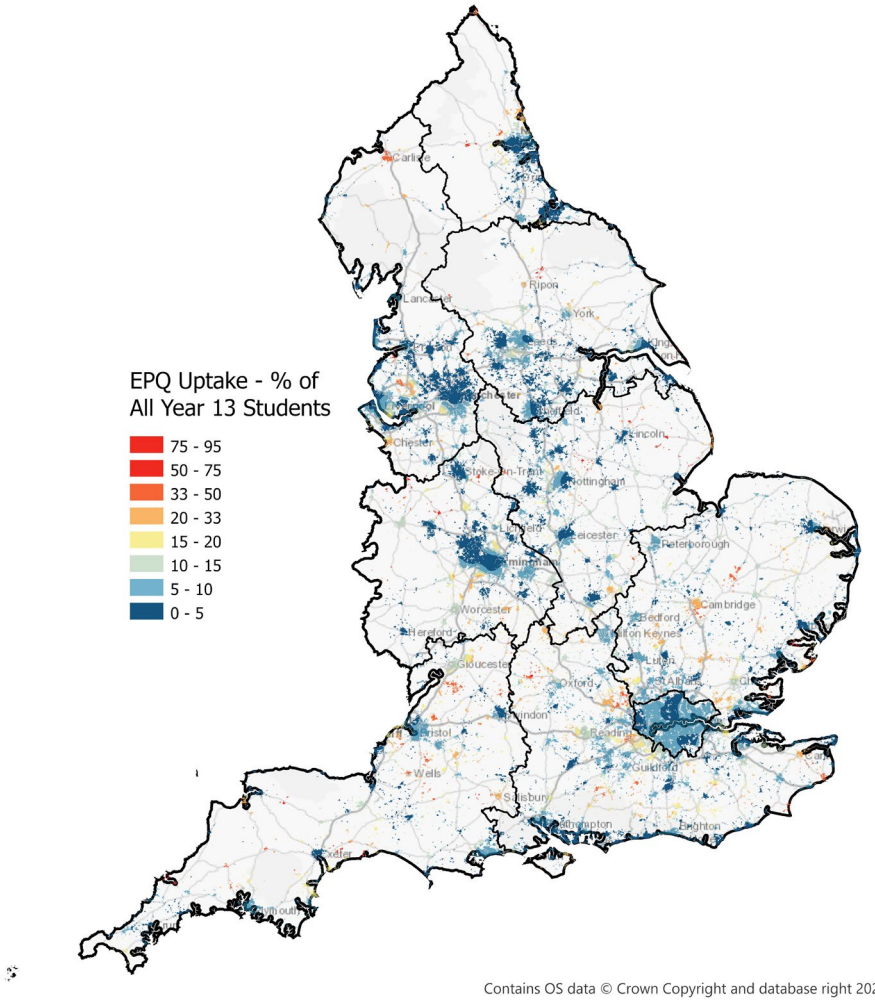


Figure 5 EPQ uptake 2018/19 - student entries aggregated by IMD deciles at MSOA level



(a) State sector



(b) All providers (including independent schools)

Figure 6 Population adjusted EPQ uptake (a) State sector provision and (b) Including independent schools

Figure 7 shows a box and whisker plot displaying population adjusted EPQ uptake for state providers, grouped by IMD decile, excluding outliers (extremely high uptake values have been removed for clarity). The plot suggests a strong socioeconomic gradient in EPQ uptake as deprivation decreases; providers in less deprived areas (higher IMD deciles) tend to have a higher proportion of students taking the EPQ compared to those in more deprived areas (lower IMD deciles).

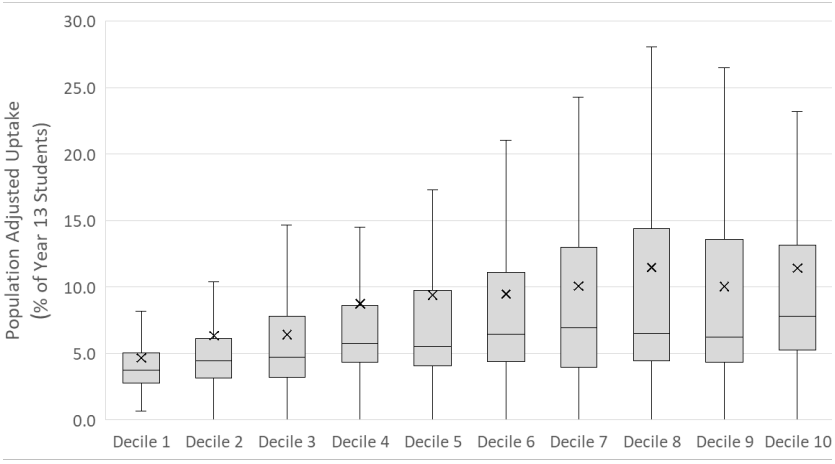


Figure 7 Population adjusted EPQ uptake 2018/19 for state sector providers by IMD decile

The above analysis highlights systemic disparities in educational opportunity, suggesting that students from more deprived areas face structural barriers that impact their access to the EPQ. Barriers to participation in the EPQ are discussed further in relation to RQ3 (section 4.3).

4.1.7.4. Geographic characteristics of EPQ attainment

Figure 9(a) displays the geographic distribution of state sector students in England who attained grade A* or A in the EPQ in 2018/19, using a KDE model based on raw student numbers. The highest density of top grade EPQ attainment occurs in Cambridge, equivalent to c.4.5 students per Km^2. In the North West (near Skelmersdale, Orrell and Wigan) the density is c.2.9 students per Km^2 and c.2.7 in Winchester. The highest density in London is centred on Surbiton and Kingston upon Thames, at c.2.3 students per Km^2. In the remainder of the country the density of A* and A attainment is less than 1.5 students per Km^2.

Figure 9(b) shows EPQ attainment expressed as the % of the provider cohort gaining A*/A, revealing a more diverse picture. Greater London is now the highest scoring location, with a density of more than 5% per Km^2 gaining a top grade. St Albans, Old Oscott (Birmingham), Liverpool and Altrincham all have a density between 4 to 5% per Km^2. When EPQ attainment is expressed as the percentage of the provider cohort gaining A*/A, locations identified in Figure 6(a) as the highest performers (in terms of raw student numbers) are now found to have a density of less than 1% per Km^2.

4.1.7.5. EPQ attainment and deprivation analysis

In Figure 8, state sector EPQ student attainment for all outcomes (A* through to Fail/No Result) are aggregated by IMD deciles at MSOA Level. For the most deprived areas the number of students attaining A*/A is broadly similar, rising from 911 in decile 1 to 1,161 in decile 4. Between decile 5 and 10, there is a steady increase in the number of EPQ students gaining a top grade, rising from 1,170 in decile 5 to 3,793 in the least deprived areas (decile 10).

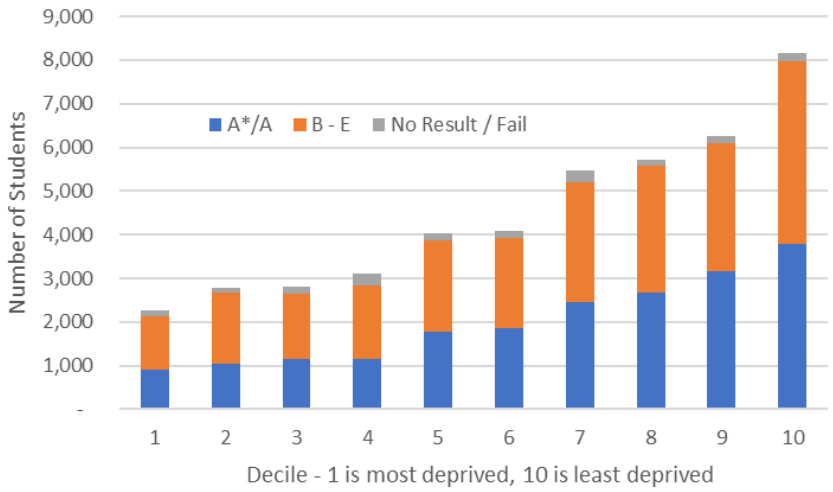
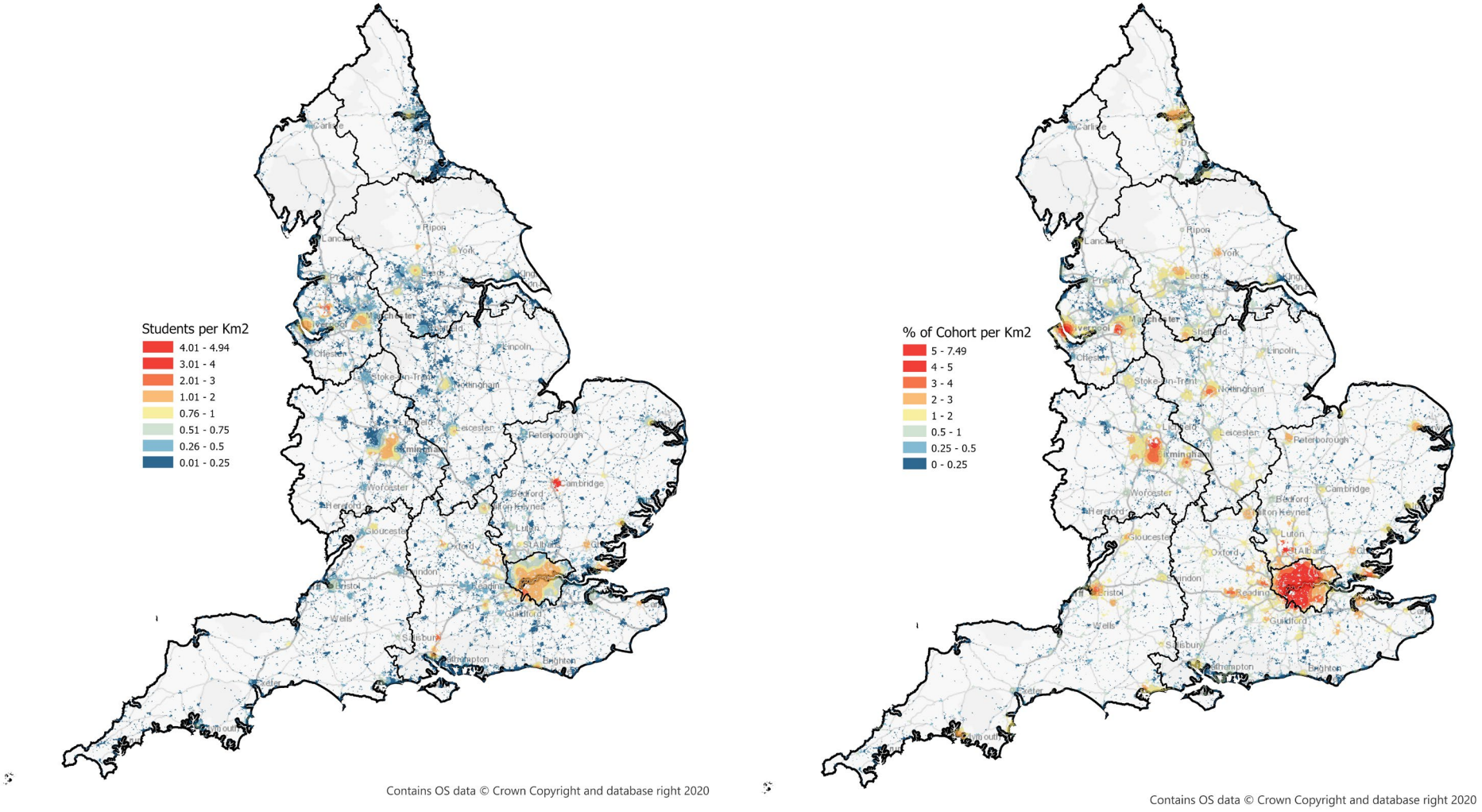


Figure 8 State sector EPQ student attainment 2018/19 aggregated by IMD deciles at MSOA level

When attainment is expressed as a proportion of uptake (Figure 10), around 40% of students entered by providers located in decile 1 to 4 achieve a top grade. This figure rises to approximately 45% for deciles 5–8 and decile 10, reaching a maximum of 50% in decile 9.

These findings suggest that providers located in the least deprived areas both enter more students for the EPQ and achieve a higher proportion of top grades — indicating an attainment gap linked to deprivation. However, for the highest grades (A* and A), the difference between more deprived and least disadvantaged deciles is relatively modest at around 5% (rising to 10% for decile 9). These findings suggest an opportunity to reduce educational inequality by enhancing EPQ uptake and attainment via targeted support in more deprived areas.



(a) Raw number of students

(b) Based on % of the provider cohort gaining A/A*

Figure 9 Kernel density estimate model of EPQ attainment for state sector provision - A and A grade*

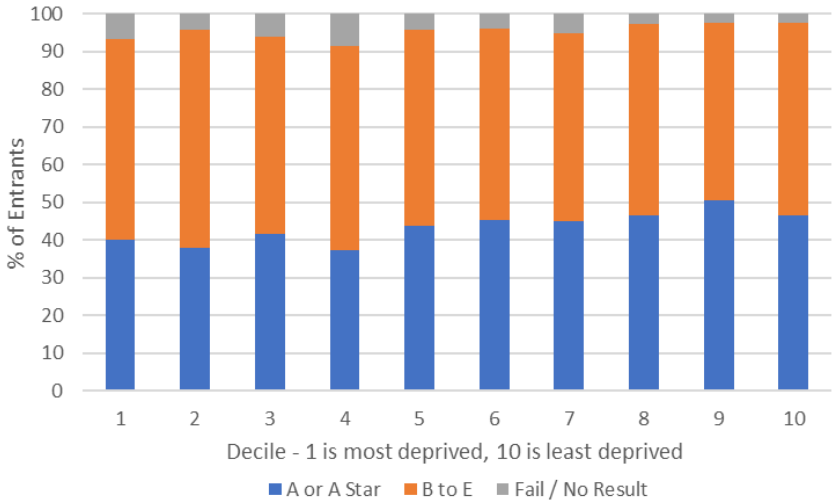


Figure 10 State sector EPQ student attainment 2018/19 - % of entrants (IMD deciles at MSOA level)

4.2. RQ2 In what ways, and for which groups, has COVID-19 impacted engagement of the EPQ in the summer examination series 2019-2021 inclusive?

4.2.1. Summary of previous research

There were nine studies from 2020 to 2022 which mentioned COVID-19 and EPQ. The first papers identified in this period described guidance and procedural processes for administering and assessing the EPQ (and other qualifications) during the pandemic. Later papers included retrospective reflections from educators and students on their perceptions on the timeliness, clarity, appropriateness and fairness of teacher and centre assessed grades.

It was clear from the literature that, at the time of the review, there was no empirical data available which spoke directly to the impacts of COVID-19 on engagement with the EPQ. There was also no literature relating to the demographics of those students whose engagement with the qualification may have altered because of the pandemic. Any focus in the literature was on the impact of predicted grades and centre assessed grades. This lack of literature indicates that conclusions cannot yet be made about the longer-term impacts of COVID-19 on EPQ engagement and on post-16 educational pathways more generally. As the data underpinning this section only extends to 2022, it will still not address the long-term trends but will give an indication of the short-term impact of COVID-19 on uptake and attainment and students' experiences.

4.2.2. Findings and discussion

The research for RQ2 encompasses quantitative and qualitative data at institutional, geographical and individual level.

4.2.2.1. Quantitative analysis

The quantitative element of RQ2 used data from the NPD. COVID-19 years were defined as 2019/2020 and 2020/2021 as these were years in which grade outcomes for all qualifications were generated from teacher assessment. As indicated in Table 2 (section 4.1.4.2) the percentage of candidates taking the EPQ was relatively high in 2019/2020 and 2020/2021

(12.3%) compared with the other years included in the study. Only the 2018/2019 uptake was higher at 12.5%.

Table 8 below shows the uptake by year for each school type, with the COVID-19 years highlighted. Uptake during the COVID-19 years was highest for independent schools, perhaps as they had greater resources to support self-directed learning, than other school types. Lowest uptake was in FE/sixth forms. In independent schools uptake was higher in the COVID-19 years than the preceding years and the same pattern was also seen for FE/sixth form colleges for 2020/21. Uptake only increased post COVID-19 for the independent sector and voluntary aided/controlled schools.

Table 8 EPQ uptake by provider type

Percentage Taken	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
Academy	13.3	14.0	15.7	16.4	15.9	14.3	14.4
Community/ Foundation	10.9	11.4	13.7	14.9	15.0	14.3	13.9
Free	11.0	13.2	12.1	22.6	16.8	11.9	10.1
Voluntary Aided/ Controlled	11.5	13.5	15.0	14.4	12.7	11.4	12.0
FE/Sixth Form	7.6	6.5	6.9	6.9	6.6	7.1	4.7
Independent	12.3	14.8	19.1	21.3	21.8	24.9	27.0
Other	22.2	21.2	29.3	31.4	24.2	22.3	7.8
Unknown	2.7	3.6	4.5	4.3	3.0	4.5	8.7

Uptake for the EPQ was greatest for students living in the least disadvantaged areas and this pattern persisted in the COVID-19 years (see Table 9)[4]. Across the IDACI range, uptake was lower in the second COVID-19 year, perhaps reflecting the fact that student and teacher focus moved towards collecting teacher-assessed evidence for qualifications with a higher UCAS tariff.

Table 9 Percentage of EPQ uptake by IDACI deciles

IDACI Decile	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
1	7.1	7.1	7.0	6.6	5.2
2	7.8	7.9	8.1	7.5	5.5
3	8.6	8.8	8.7	8.1	6.7
4	9.4	10.1	9.8	9.4	7.5
5	10.5	11.1	10.6	9.9	8.6
6	11.6	12.0	11.8	11.2	9.6
7	12.7	12.8	12.7	12.1	10.7
8	13.5	14.0	13.6	13.0	11.2
9	14.3	14.6	14.5	14.0	12.1
10	14.8	15.9	15.3	15.2	13.7
Unknown	16.7	19.2	19.7	23.1	24.7

[4] As described in section 4.1.4.4, decile 1 represents children living in the most disadvantaged areas and decile 10, those living in the least disadvantaged areas,

The model described in section 4.1.5 included a binary variable to distinguish between the COVID-19 and non-COVID-19 years. The interaction between EPQ uptake and this binary variable was not statistically significant. In other words, despite the better performance by students in the COVID-19 years, there was no evidence that COVID-19 affected the relationship between EPQ uptake and KS5 outcome. This relationship is illustrated in Figure 11 where the mean KS5 score for all qualifications is shown on the x axis and EPQ uptake (not taken, taken early or taken in the same year) is shown in the y axis. Whilst, as described previously, taking an EPQ is associated with higher KS5 outcomes, the extent to which this advantage manifests itself, is the same in COVID-19 and non-COVID-19 years.

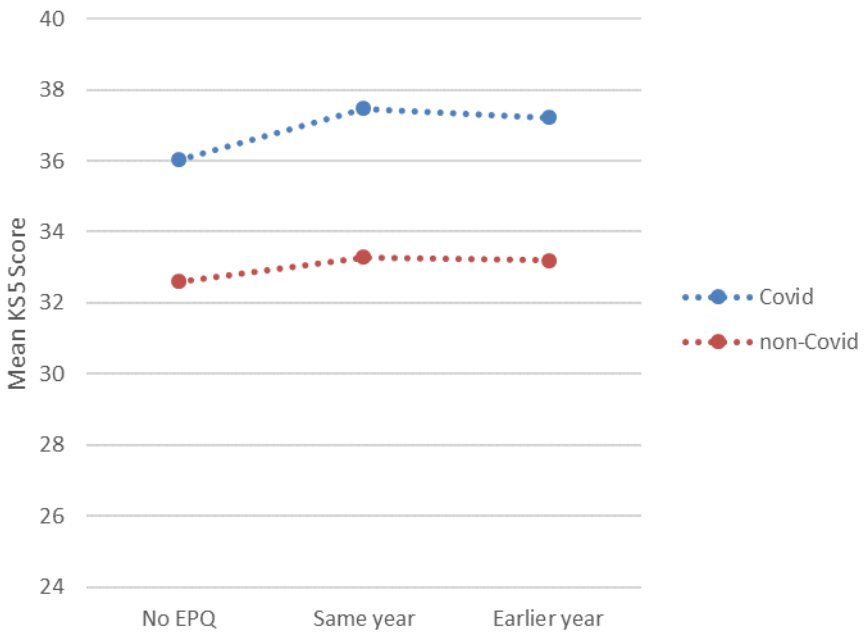


Figure 11 The interaction between EPQ uptake and COVID-19 or non-COVID-19 years

4.2.2.2. Qualitative analysis

Interviews with 20 teachers asked how the award was managed during the COVID-19 pandemic (changes to uptake, withdrawal or assessment); whether any new mentoring practices came about as a result of the pandemic; and whether any new practices were retained.

4.2.2.2.1. EPQ delivery and engagement

The interviews revealed that COVID-19 had limited impact on the delivery of, and engagement with, the EPQ but there were variations between centres. The centres that were least affected by COVID-19 lockdowns in this context were those in which their digital 'offering' was already well advanced (online teaching capabilities and EPQ resources were in place).

> *I think I've been introduced to Google Classroom prior to EPQ. And so I was unusual in having a fairly, well a fully-fledged classroom with all the resources available… we had the platform.*

The centre-allotted timings of the qualification also affected the extent to which COVID-19 disrupted the EPQ; those with pre-Easter submission deadlines (in both Year 12 and Year 13 students), for example, were less impacted than those centres that were only part way through the qualification when lockdown was imposed.

> *We weren't maybe quite as impacted as some other schools would have been, because we had the vast majority of it under our belts.*
>
> *We'd just really finished or getting to the end of our process when COVID hit…we shut down in March, we were just finished. We just got to the presentation stage. So, the kids had just given us their essays and we still had to do the presentations. We just did all our presentations online. So, we did it by Zoom, or whatever we were using.*

Educators who worked with students on the EPQ during COVID-19 employed a variety of practices to encourage engagement and support students to complete the qualification during these protracted periods of uncertainty. For example, EPQ teachers used students' self-recorded videos as a way of showcasing EPQ projects when in-person presentations were no longer permitted and educators posted online bespoke skills sessions (lessons, videos, student-created content, etc.). Teachers reported on the pastoral nature of teaching the EPQ, perceiving it to support relationally-rich pedagogical interactions. Some found this particularly useful during lockdown to encourage student engagement with virtual schooling. Online mentoring practices in these contexts included easing students into EPQ study periods via introductory 'catch-ups' and 'check-ins' which, as this teacher suggests, helped reintroduce an element of humanity and sense of connectedness:

> *It's interesting, a lot of those conversations would start in a kind of almost pastoral way, because you say kind of 'What have you been doing? Have you been outside? Oh, you've started to play chess online.' So, you get some sort of human element rather than: 'Let's look at page 8.'*

4.2.2.2.2. EPQ outcomes

The interviews did not suggest a typical pattern of improvement in EPQ grades during the pandemic when compared with previous or subsequent years, although some did suggest that the COVID-19 grades were broadly in line.

> *In the end… [of the] two COVID years … We actually were able to get, I would say, quite similar outcomes, which I think was to the credit of EPQ as a qualification.*

Those students who had opted for more 'creative' forms of the EPQ, such as a performance or artefact, were felt to have potentially been more affected by COVID-19.

> *The ones who suffered most were the ones who were doing, or trying to do, artefact work. Some of them are able to digitally, but for a lot there was, you know, they literally couldn't continue.*

4.2.2.2.3. Nature of EPQ

According to teachers, the flexible nature of the EPQ lent itself to effective adaptation during lockdown periods. This may in part offer some explanation as to the reason for its success through the pandemic.

> *Yeah, I think a lot of students found some sort of comfort in the EPQ. Because it was something they could keep doing in a fairly uninterrupted way, so I think engagement with it during the COVID lockdowns was perhaps not as affected as others.*
>
> *If any subject was less affected by this, it would have been EPQ, because it's naturally more about independent research anyway.*

Educators also pointed to the fact that the relatively small class sizes associated with online EPQ mentoring and supervision enabled opportunities to connect with students during the pandemic. And there were some examples of mentors individually emailing their EPQ students during lockdown to help them maintain their 'momentum'.

There was some evidence of centres adapting the delivery of EPQ to respond to perceived mental health challenges experienced by students through the pandemic. Some reported adopting more relaxed approaches to internal project deadlines and students wishing to exit the course. These concessions were largely motivated by concerns and lack of guidance regarding students' mental health.

4.2.2.2.4. Legacies of COVID-19

What was clear from the interviews with teachers is that COVID-19 triggered a pivot to digital and online methods of EPQ delivery and engagement. While some centres' digital systems were reasonably well advanced prior to the pandemic, others were far less so. The response to COVID-19 has accelerated the adoption, development and wider usage of bespoke and off-the-shelf IT solutions for EPQ project management, logging, submission and assessment.

> *During Covid, though, what happened was we had to shift to online. And so it was, it was kind of like morphing into an online course, anyway. So, the kids have got the resources online, they can send messages backwards and forwards to their supervisors. That's evolved. Now we have started Project Q it's got a whole lot easier.*

Poor student mental health was regarded as a significant legacy of the pandemic. In response to a perceived increase in social and performance anxieties, some schools and colleges retained video performances as an alternative to in-person presentations and/or gave students control of audience composition and size. The increasing use of digital project logging tools also helped students to organise their approach and manage their time and educators to monitor progress against predefined EPQ targets.

4.3. RQ3 What are the barriers to participation in the EPQ?

This question aimed to discover the challenges involved in students participating and successfully completing the EPQ where it is offered within schools and colleges.

4.3.1. Summary of previous research

Using a systematic literature review, 18 studies from 2007 to 2023 mentioned barriers to participation in the EPQ with the earliest paper reporting on the experience of the first cohort. Seven academic journal articles form the main sources (Cartwright, 2013, 2016; Coltman, 2020; Holmes-Henderson, 2021; Khanolainen, 2023; Stoten, 2014; Wagg and

Mackinney, 2020) and were based on qualitative accounts from educators and students. In addition, there were three opinion pieces from the grey literature (Taylor, 2015, Campling et al , 2022; Sutcliffe, 2011); four theses (Petteifer-Thompson, 2019; Rochford, 2021; Stone, 2018; Takei, 2021); three Examination Board reports (Pinot de Moira 2007a; Rodeiro, 2013; Walland, 2019); and one funded project report based on a large-scale partnership between schools and universities (Holliman, 2018).

In summary five barriers were identified in the literature:

Barrier 1: Providers do not offer the award, or do not offer it to all students. Senior managers were responsible for deciding the scale of the EPQ offer and how widely or selectively it is offered. Funding impacted this, but so did perceptions of the ability of students (Cartwright, 2016) and perceptions about whether this would help or hinder attainment.

Barrier 2: Perceptions impacting student choice and engagement. Students' perceptions about their own time management and competing work pressures impacted motivation to take the qualification.

Barrier 3: Voluntary student and staff involvement in the EPQ is precarious. This impacted on uptake, in contrast to providers where it was structurally embedded and normalised in the culture.

Barrier 4: Limited teacher preparation and confidence for mentoring/supervision. The literature included perceptions that educators require personal research experience before being able to adequately supervise or be confident supervising student EPQs. Ad hoc approaches to staffing the EPQ were found to further undermine confidence.

Barrier 5: Uncertainty about whether the EPQ enhances access to Higher Education. Lack of clear signalling from HEIs about the extent to which the EPQ would impact the university applications process, as well as the need to prioritise A level attainment, led to uncertainty in relation to access to HE. Being able to offer personalised advice on qualification choices was seen as a way to reduce this uncertainty.

Previous studies do not provide a comprehensive understanding of the barriers to schools offering the EPQ, nor to patterns of student participation, retention and success where the EPQ is offered. Insights come from a very limited number of relatively well-resourced providers, leaving a gap in knowledge about the way in which barriers to the EPQ are perceived and reproduced more broadly. There is a specific knowledge gap in the context of deprived areas where resource constraints and teacher shortages are more common.

4.3.2. Barriers, knowledge gap and the qualitative data collection approach

Twenty teacher interviews, drawn predominantly from deprived areas, were used to gain a broad range of views on how barriers to the EPQ are perceived and reproduced at student-, teacher- and school/college-level. Educators were asked to describe barriers to offering the award to all students, barriers to some students participating and barriers to completion or beneficial outcomes. In focus groups with students who had recently completed the EPQ,

the students were asked about any barriers they had experienced in taking the award and also to share the perspectives of their peers, including those who had not taken the EPQ or dropped out.

4.3.3. Findings and discussion

The interview participants included providers who were offering the EPQ in different ways, including:

- A compulsory qualification offered at a large scale.
- Currently a compulsory qualification but transitioning to optional.
- A qualification offered selectively to students based on student interest.
- A qualification offered selectively based on successful prior attainment.

This allowed us to explore teachers' perceptions of barriers to offering the EPQ to all students and the barriers experienced by particular groups that they identified. This section includes narrative quotes from educators and in some cases also student voices (for clarity, student voices are indicated by the word **Student** in bold following the quote).

The risk of student drop-out is present at every stage in the student journey, compounded by resourcing issues which include staff capacity. The retention of students at each major stage of the EPQ is a balance between institutional resourcing and procedures, student persistence and staff motivation and skills. Barriers in this section are described at each stage of the EPQ process from being able to take the EPQ, persisting when it is challenging, completing the qualification successfully and finally teachers' perceptions of barriers to using the EPQ to help students gain any associated benefits. The next section outlines these stages in turn and begins each stage with provider-level barriers, followed by educator-level barriers before ending with barriers experienced by students.

4.3.3.1. Barriers to student access

The cost of providing the qualification is the key barrier to schools and colleges offering access for all students. Costs comprise: timetable time; staffing (time for teaching, mentoring, marking and leadership time); and facilities (dedicated rooms, software). The EPQ was viewed as expensive and it was the norm for the EPQ to be selectively offered to limit costs. In the following example a selected group based on high prior attainment were called 'honours students' and the EPQ was part of their student experience:

> *We used to make everyone do it and that didn't work particularly well for a year or two. Now we've changed it… all honours students have to do EPQ to be [on] the honours programme.*

The need to maintain high grades and institutional prestige was important for senior leadership teams (SLT), based on assumptions about students with low prior attainment getting low grades. This also created further impetus for offering the EPQ selectively.

Where there was insufficient staff capacity to support all students to take an EPQ, most providers relied on high drop-out rates early in the process to preserve staff time and funds.

> *I'll take 50 students that really want to do it and then I know that there will be a natural drop out. But I couldn't personally [mentor] more than 30 students.*

Normalisation of students dropping out in the culture of the educational provider is encapsulated in this teacher quote:

> *We give them the opportunity right up until half term, you know; no drama, no judgment. 'If you want to go off and leave the course, that's absolutely fine'.*

In settings where the EPQ was compulsory, absence due to physical or mental health issues (meaning students cannot attend enough sessions) was the most significant barrier to access.

According to teachers, students experience a variety of pressures when choosing the award (where it is optional) mainly relating to time commitments e.g. caring responsibilities, the need to do part-time paid work and lengthy commutes. One interview revealed that commuting repeatedly translated into requests for online only provision. Timetabling clashes impacted those students resitting previous qualifications, or those making specific subject choices (e.g. further maths). Staff also said that some students saw the application process as time consuming (e.g. where students were asked to produce a concept-map and ten referenced sources over the summer to demonstrate their commitment).

In addition, staff said that student perceptions that the EPQ was not needed were related to a perceived lack of strategic benefit for their next steps (e.g. where the award doesn't give a reduced offer for a particular university). This was challenging to manage where the EPQ was compulsory. Where the qualification was optional, peer influence was also a significant factor with students sometimes choosing to drop out in friendship groups.

4.3.3.2. Barriers to participation

Once a student is registered on the EPQ programme, a variety of additional barriers exist. At the institutional level, the cost of outputs or specialist kit or digital resources (e.g. paywalled access to academic articles) puts pressure on finances. In providers where the award is compulsory, this could mean limiting the scope and type of projects due to pressure on resources.

> *Drama productions require staff support… there's a drama technician here. Whilst I know it's an independent project, the theatre area is his space and he would need to supervise to make sure they are safe, to make sure that the props are designed correctly and the lighting is done correctly … you can't put on an infinite number of productions.*

Project costs were acknowledged to create inequities in terms of project ambition.

> *So, we say to people you know: "you might want to do all of this, but you know, either you fund it, which you know, if you can afford that, brilliant. But if you can't, then maybe scale it back."*

Pressures on staff led to some educators dropping support for creative outputs (e.g. artefacts/performances) due to their perception that it is harder to get a good grade, their lack of confidence with marking and a sense that it takes more effort.

> *I've kind of started to steer away from artefacts. Some outcomes have been excellent, but by and large, it's far more difficult to deliver and to be honest, to kind of influence an outcome.*
>
> *I told them there were two options, but I did not celebrate the notion of an artefact. I took that decision for my own well-being.*

For some students, perceptions of the time required for artefacts presented a barrier.

> *I think one thing that deters people from doing the artefact is that you then have to make the artefact, AND then you have to write an essay with the artefact.* **Student**

Some students perceived that a lack of teacher guidance on creative outputs was a barrier to success.

> *When students do topics that are more creative, I just think sometimes they [teachers] just get a bit stuck on how to help.* **Student**

Many students stressed that the workload exceeded their expectations. Student barriers to ongoing participation persist once registered, particularly around competing demands such as part-time work and the Duke of Edinburgh award.

> *I struggled a lot with time. Because I do have a part time job and I also have a lot of sporting commitments... And I did really struggle at first, balancing things like my training with planning and researching the EPQ.* **Student**

Some student barriers were specific to particular groups, such as those with an Educational Healthcare Plan (EHCP e.g. for neurodiversity). Specific learning difficulties were identified in multiple educator interviews as a barrier due to the project's broad freedom of choice, or difficulty with breaking tasks down. In multiple institutions this was a barrier to ongoing participation as students dropped out.

> *Students with an EHCP sometimes find it quite challenging because the amount of support which they need means that it's particularly difficult.… so, I'm thinking particularly of students who are autistic, they've struggled with the freedom of choice.*

Low prior attainment means the EPQ can be seen as an additional burden alongside other qualifications (particularly A level) and students may drop out due to not doing well in their other subjects. In some cases, where students did not meet intermediate deadlines, educators removed them from EPQ.

> *I ask for the students to email me an expression of interest initially by a deadline. I start introducing small activities with deadlines that they need to complete. I give them plenty of time at this point, anyone who doesn't make a deadline at that point will be removed from the group. "If you're struggling to meet a very generous deadline at this stage, then it's not advisable that you continue because you won't be able to manage later down the line".*

Some students start university applications and realise part way through their course that the EPQ is not going to reduce the offer on their chosen courses, so choose to drop out at this stage.

> *I am applying for dentistry, I didn't actually need EPQ, they don't really consider EPQ when you do dentistry...So I just felt like the motivation to actually complete wasn't there because I knew I didn't need it.* **Student**

Despite this, many students reported persisting when they had a strong intrinsic motivation, even if others were not supportive.

> *I was kind of told my idea was too narrow. It's not really going to take me far enough. Because I wanted to do the project, because I really enjoyed the idea and the concept... I was like, 'I'm going to do it anyway'.* **Student**

> *I never really got to the point where I was like, I can't do this anymore, but I feel like from outside noises, like from what people around me would be saying, 'I don't feel like you're going to actually complete it. I don't think you're actually going to make it to the very end', that actually motivated me to finish it and do it to a good enough standard.* **Student**

Student personal motivation was significant in overcoming barriers connected to high workload and competition for time with other qualifications e.g. mock examinations.

The specific skill set that the EPQ demands relating to information literacy was a challenge for many students, including extensive searches, reading, synthesis and logging reflections, with students expressing the high cognitive load this represented.

> *I've never been good at English. So, seeing such long passages, seeing words that I don't even understand... kind of made me like mentally tired as well.* **Student**

> *It ended up being quite time consuming, especially because you're finding the non-biased information. That took a lot of research time and a lot of energy.* **Student**

> *It's not easy to look at so many different passages, pick out the right information, making sure on top of that that you don't plagiarise and use someone else's words as your own.* **Student**

4.3.3.3. Barriers to success

One barrier to successfully submitting the EPQ was plagiarism or inappropriate AI usage. Several teachers described the process of carrying out plagiarism checks and, if clear evidence of misconduct was found, would follow a strict process involving a paper trail, meetings with senior leaders and bringing in parents. It was commonplace to withdraw students who had inappropriately used AI, with no resubmission allowed.

Where the EPQ was not compulsory, a perceived barrier to success was a lack of in-depth teacher knowledge of the qualification e.g. resulting from rapid staff turnover and the need to train new supervisors every year. A lack of familiarity with the requirements led some teachers to fear being overly directive and to refrain from showing examples as they would

in other subjects. Fears of 'over teaching', showing previous work and students' work not being sufficiently independent were relatively common.

Some providers delivering the EPQ on a large scale were critically reflective of differences between their team of EPQ mentors. In one college, large scale delivery was made possible because a variety of mentors were recruited.

> *Some mentors are teachers, or previously teachers, some are not. Some may have social work backgrounds and they find it slightly difficult to hold students to account.*

Low student attendance persists as a barrier to successful completion. In some cases, significant absences meant students were removed from the EPQ. Other reasons for removal/non-submission included where poor-quality work was handed in. In some cases, students struggled to break the research project down or to synthesise literature or findings.

> *I have medical issues and I was missing lessons because of doctor appointments, tests and stuff. It was sometimes really hard to keep up.* **Student**

Educators in large sixth form colleges (where there catchment included privileged and deprived geographical areas) mentioned a lack of cultural capital as a barrier. Teachers were concerned that some students lacked confidence when talking about research and were over-awed by articulate peers. They also expressed concern for students with limited access to high quality feedback from people (outside of EPQ teachers) who can act as a sounding board for ideas.

> *But that idea of the EPQ I think, in a way, mirrors that kind of slightly middle-class dining room table conversation in that it's the kind of 'discussion of an interest' that lots of students will have with their families. But lots of students don't have any access to that.*

Students also acknowledged differences in access to materials such as journal articles as a barrier to success.

The students in our focus groups had taken the EPQ at four different start and submission points and all students reported struggles with meeting deadlines, competing demands and high workload. The timing of the qualification was also perceived to be a barrier to success by one student, who had a choice of when to take it:

> *I think the major factor was when I chose to do my EPQ, if I had done it in Year 12, it could have been a different story. But I chose to do it at the start of Year 13 where I was at those crucial times of where I was applying for degree courses.* **Student**

4.3.3.4. Barriers to closing the opportunity gap

The most important barrier to accruing benefits from opportunities gained from completing the EPQ is student drop out. Providers who described robust, scaffolded and unwavering support for students to remain on the EPQ had a strong ethos and culture built around the award, which was clearly communicated to parents. The more lenient ethos amongst other providers created a significant barrier to using the award to open up opportunities as particular groups of students are the most vulnerable to low uptake or

high dropout due to absenteeism, the need to spend time caring or in paid work, retaking other qualifications or commuting. Misuse of AI, the removal of disengaged students and even deliberate non-submission by students (due to their perception it may hinder UCAS applications if the EPQ grade was poor) were also new to the existing literature on barriers. The varied perceptions about levels of direction, support and modelling were also novel insights into the impact of a school or college culture on student success.

Cost in terms of funding changes, time and staffing, as well as technical investments in equipment was a significant barrier for senior managers. This led directly to decisions to offer the award selectively (e.g. based on KS4 results), impacting students with low prior attainment or based on student self-selection to limit numbers. At the educator level, fears over being too directive were broadly held and linked to restricting students to lower-risk essay assessment options.

The students who experience the most significant barriers to taking or benefitting from an EPQ in the context of the schools and colleges represented in this report, were described by teachers (in order of frequency) as those with:

- Low prior attainment, particularly poor literacy levels including English as a second language and poor written English, including students with resits to complete.
- Restricted time due to paid part time work, caring responsibilities, or long commutes.
- Low levels of cultural capital relevant to research e.g. lacking experience in relation to universities, libraries and galleries; limited external connections to encourage enrolment, sustain motivation or counter peer influence; inexperience in communicating and developing research ideas through conversation (oracy).

  Over half the students are pupil premium students. They have no cultural capital, basically. That is one of the things that's really hammered home in terms of our priorities as a college. I feel that EPQ really feeds into that in terms of developing those skills that they're not necessarily getting from A level or Level 3, study.

Further aspects of barriers included: students with challenging home working environments (e.g. lack of space, digital access, internet connection); high levels of absenteeism due to complex home and/or health issues (e.g. EHCP, care experienced); students with additional needs (e.g. difficulty synthesising information). Gender and ethnicity were mentioned by teachers when speaking about lower attainment, literacy challenges, particularly boys, those with Black heritage or White working class and the cultural/ethnic mismatch between staff and students.

With these barriers in mind, the next section provides a summary of the practices from across the schools and colleges in our sample to describe how the delivery of the EPQ was used to confer the benefits associated with the award such as critical thinking skills, entry to university, etc. In this way the EPQ represents an 'opening up of opportunities' for students. The approaches are organised into inclusive practices (equality of opportunity) and targeted practices (creating a more equitable opportunity).

4.4. RQ4: What practices help deliver good outcomes in schools which provide wide access to the EPQ?

This research question aimed to explore three different but overlapping ideas: an understanding of the range of practices associated with EPQ delivery; how 'good outcomes' or benefits are conceptualised; and the way in which access to the EPQ and its associated practices may be offered to benefit the greatest number and broadest range of students. There is no published research to date covering the intersection of these three elements. However, more broadly, salient practices for mentoring school student research have been described (Walkington and Rushton, 2019) and school – university partnership initiatives (SUPI) have been implemented, some of which include university students or staff supporting EPQ students (Hamilton and Hughes, 2017). The literature from 2007-2023 on practices associated specifically with delivering the EPQ is extensive (60 articles) but heavily skewed towards independent school providers that offered the award selectively. The ways in which that literature described successful EPQ outcomes is presented below, as this informed the research process.

4.4.1. Summary of previous research on beneficial outcomes

The literature revealed eight ways of conceptualising the value of the EPQ. Although grades, university offers, admissions data and ongoing attainment in HE provide valuable metrics, other success markers are less easily measured, including a discerning attitude to information (information literacy), enhanced confidence and aspirations for employment or further study, lifelong learning frameworks and enriching professional development for mentors can enhance the lives of those involved well beyond the EPQ itself.

4.4.1.1. Success marker 1 – The award/grade

In addition to achieving 'good grades' (Beatty, 2020) valued by school managers and school-university partnerships (Houghton, 2018), successful completion of the EPQ (regardless of grade) was important due to the development of skills associated with long term attainment benefits (Hamilton, 2017; Thompson, 2023).

4.4.1.2. Success marker 2: Portfolio of creative projects

McNeill (2018) highlighted the value of students leaving school with a tangible and shareable output, portfolio or even published student work (Shenton, 2019). In other instances, more intangible concepts like the research being used to 'make a difference' (Beatty, 2020) were valued.

4.4.1.3. Success marker 3 – Skills development

Many of the success markers are student learning focussed, with learning gains centred on the development of research skills, information literacy, particularly information discernment, as well as more general project management skills. This includes asking questions, managing data and disseminating findings, which may include networking with experts (Dunlop, 2019; Ferreira, 2018). Student information literacy was regarded as transferable (Walton 2017; 2018), valued in contemporary workplaces (Ryan 2019) and linked to access to Higher Education (Harvey 2016).

4.4.1.4. Success marker 4 - Emancipatory learning approach

The EPQ was viewed as an emancipatory learning style, where students gained recognition for being creators of knowledge (Huxtable, 2009). Educators recognised the development of creativity and imagination through self-determined projects (Price, 2018), allowing students to access university style opportunities and learning experiences. This approach in promoting intellectual curiosity and widened interests among students was echoed by Menzies (2023) noting how it acted to broaden the 16-19 curriculum.

4.4.1.5. Success marker 5 – Confidence and aspirations

There was anecdotal evidence of the EPQ giving students subject confidence, raising the quality of student presentations (Vaughan, 2009) and raising aspirations (Hamilton, 2017; Rhodes, 2012).

4.4.1.6. Success marker 6 - Teacher/mentor professional development

Success in the EPQ for teacher-mentors includes the dual reward of supporting independent pupil engagement as well as ongoing professional development (Stone, 2018, Rushton, 2022). The benefits to those involved in mentoring from outside schools (e.g. academics, early career researchers and undergraduate students) benefitted professionally from insights into post-16 education (Hamilton, 2017; Houghton, 2018).

4.4.1.7. Success marker 7 - Entry to Higher Education

The proportion of students gaining university offers has been widely used as a quantitative marker of the success of the EPQ in schools (Grove, 2014; Vaughan, 2009, Hillman, 2014). In universities increasing numbers of widening participation students gaining university offers was a recruitment-based success measure (Thompson, 2023). Long-term achievement benefits (achievement, retention and success) at university associated with prior EPQ participation was seen as a further success measure in the HE sector. Shenton (2019) described how involvement in research had eased the transition to HE for some students. Aspirations to work in science (Dunlop, 2019) and choice of science degrees was also seen as a good outcome (Colthurst, 2018; Parker, 2015).

4.4.1.8. Success marker 8 - Lifelong learning frameworks

The EPQ activity log was viewed as a successful framework for structured reflection on reading (Zetie, 2017) and useful for lifelong learning (Stoten, 2019).

4.4.2. Practices knowledge gap and qualitative methodology

Although the literature offered an insight into a range of tangible and intangible benefits or ‘good outcomes,’ it arises from a small sample of providers predominantly from independent schools. There is a gap in understanding how beneficial outcomes are achieved at scale in areas of deprivation. The sampling strategy adopted in this study was spatially targeted towards deprived areas to gain educator and student voices on the enablers to success in providers which offer the EPQ broadly, located in areas associated with the highest levels of deprivation.

For RQ4 interviews focussed on asking educators about the way the qualification is delivered. Educators were asked to describe: the way the EPQ was offered and how broadly; how the EPQ was managed in terms of supporting students (i.e. specific practices for retaining students, supervising/mentoring, teaching); effective practices for successful outcomes (and how success looked); and the value of the award to the provider.

4.4.3. Findings and discussion of practices for enabling student access, participation and success in the EPQ

Two broad approaches were reported by teachers: inclusive practice focussed on equality of provision for all students; and targeted approaches to equity by supporting particular student groups. Inclusive practice was mainly focussed on equality of access in the school or college, making learning opportunities accessible to all students. However, targeted approaches acknowledged barriers for specific student groups, with practices aiming to support retention and success for targeted groups. Bold font is used to highlight key themes in the sections below.

4.4.3.1. Inclusive practice

The most effective strategy for enabling student access to the EPQ was making it a **compulsory** part of the curriculum. This was achieved through clear communication with students and parents. Some of the largest sixth form college providers deliberately targeted students from less privileged catchments to ensure broader participation. Offering the EPQ as a non-selective qualification (i.e. open to all students regardless of prior attainment), welcoming late transfers and offering flexible timetabling to accommodate diverse subject combinations provided greater inclusivity where it was not compulsory.

> *I think with some centres, there are a lot of students that are maybe stopped from doing the qualification because they haven't got a certain GCSE. So, it's become like this elitist course, if they're doing something they're super passionate about, that doesn't matter. They're going to really achieve and get a high grade out of it.*

Timetabling played a critical role in enabling access for students. Schools and colleges embedded EPQ sessions into the school calendar, often scheduling weekly lessons in dedicated spaces with computer access. Many institutions timed the delivery of the EPQ to avoid clashes with Year 13 exams and other coursework deadlines. Flexible delivery of the EPQ included varied start times in the academic calendar and some flexibility with submission windows, with different educational settings tailoring delivery to their own context and specific students' needs. Embedding the EPQ within the culture of the institution further enhanced access for students and developed an important **sense of belonging**.

> *No one has ever been turned down, last year the person in charge of EPQ put on extra sessions to ensure that every child who wanted to do it could do it, because sometimes the timetable wasn't working, she did additional lessons to make sure everyone could do it.*

Resourcing and senior leadership support were vital to broad participation. Successful providers allocated dedicated rooms, budgets and staffing to the EPQ, treating it as 'a subject in its own right'. In certain cases, EPQ supervision was tied to teacher pay

progression, incentivising staff involvement. Alumni and external speakers were also engaged to inspire students and showcase the EPQ's real-world relevance. One institution trained and used external markers to manage the delivery of the EPQ at scale.

Recruitment to the EPQ was promoted during student enrolment, throughout the academic year and occasionally also in staff recruitment. Tutors and mentors consistently reinforced the value of an EPQ, often using it to highlight an opportunity for creativity and breadth in learning, as well as linking it to future opportunities such as higher education and employment. Teachers played a pivotal role in student recruitment where the EPQ was optional. Preparations began early, often with summer homework and guided tasks to introduce students to the qualification. Launch events and assemblies helped to build awareness amongst students, while parent webinars explained and reinforced the long-term benefits. The EPQ was framed as a unique opportunity to explore personal interests and develop independent research skills. In terms of capturing interest, students' own ideas were prioritised, with teachers encouraging a wide range of topics. Some providers also utilised external community/business representatives to help promote the EPQ.

> *Our induction event for Year 12 this year, the EPQ 'Kick-off', is where we brought in employers and outside and external agencies and students who've just completed the EPQ. Students can walk around and hopefully have some conversations and be inspired by what they see there.*

There was variation in the promotion of assignment options. Creative options like artefacts and performances tended to be most proactively encouraged when the award had been offered within the school or college for several years, as teacher confidence and familiarity had grown. As might be expected from a self-selecting sample, teacher motivation was high, with educators expressing a deep sense of fulfilment from supporting EPQ students. Teachers viewed the qualification as a chance to nurture independence and life skills, in contrast to the more prescriptive nature of traditional subject teaching.

Participation and retention were supported through a range of practices. In settings where the EPQ was compulsory, students were expected to complete the programme and this is clearly communicated, with one-to-one support offered to those at risk of disengagement. The EPQ was framed as fun and creative, helping to sustain interest.

Success in the EPQ was perceived to be closely linked to strategic timing. Delivering the qualification in Year 13 was often preferred, due to student maturity and focus. Flexible submission deadlines and extension options provided a safety net for student retention. Monitoring progress was standard practice, with spreadsheets and calendars used to track completion against milestones. Some providers also reported evaluating programme quality through SWOT analyses, organising student focus groups and agreeing performance targets with EPQ leaders.

Peer and external support further enhanced ongoing participation and developing **a sense of belonging**. External speakers and university workshops were used to provide enrichment. Peer mentoring was scaffolded by teachers, who had developed a bespoke curriculum and sets of classroom material. These interactions helped students feel part of

a collective experience and reinforced their commitment to the EPQ. Building relationships between students through EPQ delivery was seen to build a pastoral, college or sixth form 'experience'. Where the EPQ was optional, a sense of belonging was further cultivated through friendly EPQ spaces, celebratory rituals and open-door policies. To reduce presentation anxiety, students were given control over their topics, presentation formats and audiences.

Maintaining a **resource**-rich environment was important. Digital literacy was embedded in teaching, including responsible use of AI tools. Some providers had a small budget to resource EPQ artefacts or university library visits (to allow access to published work). All students were given online access to curated materials to support learning. One school invested in access to journal articles for all their students, due to a lack of student access to digital resources, especially laptops in their catchment.

> *We've got JSTOR as a journal platform and we got [bought] a school access to it. And so actually, as much as it's a little bit outdated and it's not going to say that all the most recent stuff, it means they're experiencing that, you know, university style of research and they can kind of go through the process properly of looking things up in that fashion.*

In contrast, some focus group participants reported using their own social connections (e.g. friends at a private school) to gain access to articles.

When **interpreting exam board guidance** practice varied significantly in two areas: the use of examples of previous work and levels of individual support offered as standard. While some teachers avoided using examples to prevent copying, many shared past projects (e.g. essays, artefacts, videos of presentations) to model expectations and inspire students. Educators managed the delicate balance between offering authentic levels of challenge and providing support. Most did this by showing genuine excitement about student topics through asking questions, coupled with offering generic writing guidance and helping students manage their workload in taught sessions. However, one-to-one support from a mentor/supervisor was especially valued by students, reassuring them about expectations and helping to break down projects into manageable next steps, mostly done individually but within timetabled time.

> *What I can see is powerful, and that works and helps retain the students, is the one to one attention and the time and focus that they get. That that timetable slot is theirs. For that [slot], with that person, they should have their completely undivided attention. And all they're talking about is them and their piece of work. I think, for our students and the nature of our students, it might be one of the only times that they actually get that.*

In response to students falling behind, or for those who had learning support needs, interviews described additional drop in and surgery sessions as part of an inclusive delivery.

4.4.3.2. Targeted support

Proactive attempts at targeting support towards particular student groups to ensure equitable access to opportunities to benefit from the EPQ, was an agenda for only a

minority of providers. Nevertheless, in terms of student numbers it occurred in settings where the EPQ was compulsory and delivered at significant scale. Support focussed on developing academic research literacy through targeted writing support and building social/cultural capital and ensuring access to resources.

Educators keep selling the long-term benefits, having conversations with doubting students about the value of the EPQ beyond university. This included relating the skills learnt to a 'skills audit,' so students were aware of the benefits of the EPQ for career development. One example of a targeted approach was building social connections by inviting recent alumni to support students who do not have 'societal contacts' at home:

> *Students who are currently on a gap year, either before university or after university, we try and get them to work with our disadvantaged groups for an hour after school, once a week, to just guide them. So, give them that kind of sounding board of someone just to sit and say, "Great, let's have a go. Tell me about this. Explain what you mean by this. Should we see if we can find somewhere you can look at more?" So just somebody to ask this kind of question.*

As poor prior attainment was recognised as a barrier, offering writing workshops for vulnerable students and tailored assistance for those with additional needs was a successful intervention. In one provider where the EPQ was compulsory, writing support was targeted towards students with 4s, 5s and 6s at GCSE through an externally delivered writing skills session.

> *The Royal Literary Fund have writers… one of those comes into school to deliver a day workshop on planning and writing, and we invite our vulnerable students into that. It's been so effective… that's probably been the single biggest intervention for those groups… It's an academic writing programme and we've used it for EPQ and our vulnerable groups.*

In another institution scaffolded writing support was offered for EHCP students e.g. to help break down tasks and provide focus:

> *We say "you've got to have some of this, some of this, some of this and some of this," rather than just giving them a completely blank piece of paper. Yeah, but then obviously they have to do all of that for their project. That seems to be working quite well because the mental load of working out what they need to do before they even get to do it, we've sort of taken that away.*

In-house mentor training incorporated targeted practices, drawing on guidance from neurodiversity charitable foundations.

> *I think the structure is important, particularly if there's issues of neurodiversity. I train mentors with guidance from ADHD foundations, where they really emphasise the importance of a structured approach and to avoid confrontational directional type approaches.*

Monitoring uptake of optional enrichment opportunities (e.g. no-cost university library visits focussed on information literacy) is done proactively for under-represented students

(e.g. Bursary and SEND). Deploying a financial hardship scheme specifically for EPQ projects was another approach.

> *I don't feel that anybody who's on Bursary should be given any lesser chance than somebody who's not. Now the artefacts in particular, there can be some cost to producing the artefacts, so whether it's through the college bursary, or if I've got to go into my EPQ budget, then we will pay towards their final product.*

Educators consistently promoted the long-term benefits of the EPQ, linking it to university offers, career development and personal growth. They used scaffolding to enhance peer mentoring (e.g. structured question banks) and alumni mentoring to enhance external networking and build social capital. Confidence was developed by demystifying academic research and helping students understand that developing research expertise is accessible to them.

Building student confidence was also developed by deconstructing how knowledge is created through research. Educators helped students with no prior family experience of higher education not to be daunted by university, academic papers or the research process. By demystifying 'expertise', mentors helped students realise they have a right to knowledge.

> *I sometimes tell them that academics just read other people's work and write what it's about. And it's not cheating. It's not plagiarism. Just at university, you pull all the bits together and then draw new knowledge. And these students, they're reading academic documents from all these different prolific people, and they just realise [these academics/authors] they're just people. It kind of takes away the mysticism.*

Staff balanced up inequalities in student confidence during class discussions by drawing out less confident students (and curtailing others who dominated discussions). Students reported the importance of dedicated mentors who offer consistent guidance, help refine topics and provide motivation.

In conclusion, the EPQ is perceived to be more than a qualification — it is viewed by many staff and students as a transformative experience. The EPQ can be used to champion inclusive practice, foster creativity and belonging and ensure every student can succeed. With a commitment to equity, thoughtful planning, strategic resourcing and targeted support, the EPQ has the potential to become a powerful tool for opening up opportunities for the future.

5. Conclusion and recommendations

Prior research on the EPQ has focused predominantly on links to attainment and HE. Instead, this study looks at patterns of access, participation and outcomes, making an important contribution to an understanding of the extent to which the EPQ provides an opportunity for all. While previous work has found associations between EPQ uptake, and both A level and HE attainment, and indicated that it provides students with synoptic learning opportunities, critical thinking and other core academic skills, few studies specifically examined EPQ uptake and outcomes by ethnicity, SES and geography. This study considers these variables in detail. No prior studies to date have examined the impacts of COVID-19 on engagement and outcomes of the EPQ. This research therefore contributes to the field by providing a mixed methods approach to understanding the potential of the EPQ to provide opportunities for all using large scale administrative data, spatial analysis and interviews and focus groups with both educators and students. It offers a robust methodology to explore the EPQ in previous research and, importantly, encompasses student voice, where this is often underrepresented in research involving high-stakes assessments. The report presents unique evidence on uptake and attainment of the EPQ, variations by background characteristics, the barriers and practices educators and students experience and can therefore contribute to the policy discourse on attainment gaps, transitions, employability and widening participation.

Our key findings show that access to, and uptake of, the EPQ is unequal; only 11% of KS5 students were awarded the EPQ across the seven years studied, 21% in independent schools, 15% from academies, around 13% from community/foundation, voluntary aided and free schools and just 6% in FE/sixth form colleges. It was taken by 15% of those in the least deprived areas and 6.5% of those in the most deprived areas. A greater number of females (13%) than males (9%) took the EPQ. Overall uptake for the EPQ was highest for those in independent schools, students in the least deprived areas, those with higher prior attainment, White students and female students. When controlling for background factors, it seems that in terms of overall KS5 attainment, devoting time to the EPQ does not appear to undermine attainment in other subjects. Indeed, students with higher prior attainment appear to perform better at KS5 when they also take an EPQ. Even for students with the lowest levels of prior attainment, where studying the EPQ might have a slight negative impact on their KS5 grades, it could still offer additional opportunities. The findings suggest the EPQ is associated with a reduction in the attainment gap for boys at KS5. It is worth noting, however, that motivational effects may play a role in those choosing to enter for an EPQ.

Furthermore, spatial analysis suggested that population-adjusted EPQ uptake was lowest (below 10%) in large urban areas, post-industrial towns and deprived coastal areas. The highest uptake levels (above 50%) were found in market towns, reflecting instances of localised EPQ provision (opportunity) and high participation amongst the local population. Providers in less deprived areas showed both higher EPQ uptake and a greater share of top grades compared to providers in more deprived areas. However, the difference in attainment levels for top grades (percentage A*/A) between the least and most deprived areas was relatively modest, at around 5–10 percentage points. It is therefore suggested that systemic disparities in educational opportunity exist and that students from more

deprived areas face structural barriers that impact their access to the EPQ. These findings indicate an opportunity to reduce educational inequality by enhancing EPQ provision, uptake and attainment via targeted support in more deprived areas.

With regards to barriers and practices, teachers perceived a broad range of barriers to EPQ uptake, retention and success, with drop out being the most important barrier to using the EPQ to open up future opportunities for students. Teachers in our sample reported that the students most at risk from dropping out were those with: low prior attainment; restricted time due to paid part time work, caring responsibilities, or long commutes; and limited cultural capital relevant to research. The retention of students at each stage in the EPQ is a balance between institutional resourcing and procedures, student persistence and staff motivation and skills.

Beneficial outcomes for the EPQ extend well beyond attainment (grades), to include skills development for both students and educators. Benefits for students included reduced university offers, information literacy, lifelong learning skills, enhanced confidence and aspirations for employment or further study. Teachers benefited from enriching professional development. Two broad educational approaches were reported by teachers to support retention and successful outcomes: the majority focussed on inclusive practice and developing a sense of belonging for all students taking the EPQ; a small number used targeted approaches, with practices such as writing interventions, flexible timetabling and networking with external contacts, aimed at retention and success for specific student groups. The EPQ was prioritised where it was seen as integral to an institutional sense of belonging and part of the student 'experience' and was important for broadening the curriculum.

6. Key messages and recommendations for policy and practice

6.1. Messages for national policymakers and stakeholders

The EPQ offers benefits to students beyond just a graded qualification, for example, improving research and critical thinking skills, non-subject specific skills and learner agency. It is viewed by many staff and students as a transformative experience. Therefore, national policymakers and stakeholders should:

- Promote the EPQ to raise awareness and recognition of its value to HE and employers.
- Support institutions to adequately resource the EPQ and to share effective practice for its delivery so that all students can participate.
- Proactively target areas of geographical deprivation that currently do not have access to the award using the **GIS Web app**. This will open up the benefits of the EPQ to more students. The **GIS Web app** will also be helpful for awarding organisations, higher education institutions making contextual offers, local authorities and senior leaders of 16-19 educational establishments.

6.2. Messages for awarding bodies

- Educator perceptions vary about the levels of guidance they can provide to students. Clearer guidance on levels of support and the use of previous work as examples could enhance teacher confidence. Further guidance on how to support and assess creative project options would benefit providers of the award.

6.3. Messages for providers, educators and Higher Education Institutions

- Provide inclusive opportunities for young people to take the EPQ, regardless of prior attainment.
- Embrace and support a variety of assessment options to cultivate student creativity and sense of belonging for diverse student interests.
- With targeted support, the benefits of the EPQ can be realised for a broader group of students to ensure an opportunity for all. This might be most effective when the support addresses research literacy, specifically writing skills.
- Highlight the wider skills and employability benefits of the EPQ to all teachers, students and parents so that they understand its strategic value beyond just a grade.
- To facilitate students' choices and realistic perceptions of the strategic value of this qualification, HEIs should clearly signal whether their courses give reduced offers based on having an EPQ. Knowledge of availability of the EPQ to students (e.g. lack of EPQ provision in a geographical area) should be taken into consideration when making contextual offers.

6.4. Further research

- Analysis of Higher Education Statistics Agency (HESA) data for years 2015/16—2021/22 could be undertaken to explore participation and longer-term outcomes of EPQ students.
- Advanced spatial analysis methods could be employed to model EPQ opportunity and access, using travel-time catchment areas for local providers.
- Quantitative and qualitative analysis of data from EPQ centres that have chosen to close provision, or centres who do not currently offer the qualification, could be undertaken to enhance understanding of structural barriers to access.
- Conduct a quasi-experimental study to measure the impact of taking an EPQ.
- Conduct qualitative research on the opportunities afforded by the EPQ for those students who do not go into HE.

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Appendix 1 - Glossary

A level – GCE Advanced levels (A levels) are the main form of high stakes examinations taken for university entrance in England (and beyond) and are available in over 80 subjects. Students normally study three or more A levels over 2 years and they are generally assessed by a series of examinations in the Summer of the second year, the outcomes of which are graded from A*-E.

Awarding Bodies – also known as exam boards. Awarding bodies are institutions responsible for designing, developing and administering qualifications and assessments. With regards to the EPQ a number of exam boards offer the qualification including AQA, Edexcel, OCR, WJEC, ASDAN and UAL.

Centre Assessed Grades (CAG) – 2020 and 2021 grade assigned by teachers which was thought best represented students' likely achievement in the aftermath of examination cancellations due to COVID-19.

Extended Project Qualification (EPQ) – at level 3 the EPQ is a standalone qualification worth 28 UCAS points and can be taken alongside other level 3 qualifications (A levels or vocational qualifications). It is designed to extend students' abilities beyond their other subjects by completing an individual project on a topic of their choice resulting in an extended written project or production of a practical piece. It is assessed internally and aims to develop a wide range of independent learning and academic skills.

Foundation Project Qualification (FPQ) – a level 1 project qualification, usually taken in year 8.

Free School Meals (FSM) – the Education Act (1996) requires the provision of free school meals to disadvantaged pupils in maintained schools, academies and free schools in England. It is therefore often used as a proxy for measures of disadvantage in research.

GCSE – GCSE qualifications (General Certificate in Secondary Education) are the main level 1 and level 2 qualifications taken by 14-16 year olds in England (and beyond). They are available in more than 60 subjects and are graded on a scale of 1-9 and are largely examined by linear examinations, although some subjects may include performance or a portfolio (for example, drama or art).

Higher Education (HE) – Higher Education is pursued after the compulsory age for leaving education and includes undergraduate and postgraduate studies. It is usually undertaken at universities and Further Education colleges (known as Higher Education Institutes – HEIs).

Higher Education Statistics Agency (HESA) – HESA collects, assures and disseminates data about HE in the UK to provide a rich, open source of HE information for data users.

Higher Project Qualification (HPQ) – a level 2 project qualification worth equivalent to half a GCSE.

Income Deprivation Affecting Children Index (IDACI) – IDACI measures the proportion of all children aged 0 to 15 years living in income deprived families.

Key Stage 4 (KS4) – the National Curriculum in England is organised into blocks of years called 'key stages'. Key stage 4 is the two years of education taught, traditionally, between the ages of 14 to 16 years within secondary schools. It is the stage in which students will undertake level 1 and 2 studies.

Key Stage 5 (KS5) – the National Curriculum in England is organised into blocks of years called 'key stages'. Key stage 5 is the two years of education taught, traditionally, between the ages of 16 to 18 years within secondary school sixth forms and colleges. It is the last stage of compulsory schooling and the one in which students will undertake level 3 studies.

National Pupil Database (NPD) – the NPD is an administrative dataset held by the Department for Education which contains information on the educational experiences of all pupils in state schools across England. In its entirety it includes information on topics such as attainment, absence, exclusions, special educational needs and ethnicity. Personal details are linked to pupils' attainment and exam results across their educational lifespan. The NPD can also be linked to other datasets, including other administrative data such as HESA.

Non-Exam Assessment (NEA) – NEA is an alternative way to assess student performance outside of formal examinations and can include project work/coursework that is internally assessed and can be externally moderated.

Special Educational Needs (SEN) – The Children and Families Act (2014) defines a child as having Special Educational Needs (SEN) if they have a learning difficulty or disability which calls for special educational provision. These may impact an individual's ability to learn.

Universities and Colleges Admissions Service (UCAS) – UCAS is an organisation which manages applications to undergraduate courses at UK universities.

Appendix 2 - Technical notes for the quantitative data analysis

2.1. A note on the calculation of a measure of prior attainment

Each grade for every GCSE and GCSE-equivalent qualification has a notional point score. For each student, the measure of prior attainment was calculated by taking the weighted average of these points across all qualifications. Weights were applied to reflect situations where a qualification was worth more than a single GCSE. In a slight deviation from the method used by the DfE, if a student entered for a qualification on more than one occasion, the best result was included in the calculation. The prior attainment score was standardised so that it was centred around the mean for all KS5 students[5].

The mean for all KS5 students was 5.32 (just over a GCSE grade 5) and the standard deviation was 2.39.

[5] The mean for all KS5 students was 5.32 (just over a GCSE grade 5) and the standard deviation was 2.39.

2.2. COVID-19 years

Defined as a binary variable denoting whether the majority of awards for a student were made in a COVID-19 year. COVID-19 years were defined as 2019/20 and 2020/21; these were years in which grade outcomes were generated from teacher assessment. Non-COVID-19 years were set as the baseline category.

2.3. A note about model fit

The model fit was reasonable with a conditional R2 of 0.410. The interclass correlation was just 0.063, indicating that the proportion of residual variance in the dependent variable due to differences between schools and colleges was low. There was no evidence of multicollinearity between the main effect variables.

Table 10 Parameter estimates and effect sizes associated with the multilevel model describing the association between student characteristics and mean KS5 score

Effect	Independent Variable	Parameter Estimate	Standard Error	Effect Size	Effect Rank
fixed	Constant	32.041	0.066		
fixed	EPQ same year	0.630	0.097	0.066	31
fixed	EPQ earlier year	0.541	0.268	0.057	36
fixed	**Prior attainment**	**10.009**	**0.016**	**1.325**	**1**
fixed	Prior attainment (squared)	2.927	0.017	0.308	6
fixed	**Male**	**-1.530**	**0.016**	**-0.160**	**9**
fixed	Asian/Asian British	-0.364	0.026	-0.038	48
fixed	**Black/Black British**	**-1.375**	**0.036**	**-0.144**	**10**
fixed	Mixed	-0.639	0.047	-0.067	30
fixed	Ethnicity (Other)	-0.261	0.059	-0.027	60
fixed	Ethnicity (Unknown/Undisclosed)	-0.677	0.040	-0.071	28
fixed	Community & Foundation	-0.487	0.117	-0.051	42
fixed	Free School	-0.480	0.283	-0.050	43
fixed	Voluntary Aided/Controlled	-0.439	0.157	-0.046	46
fixed	FE/Sixth Form Colleges	0.316	0.131	0.033	51
fixed	School type (Other)	-0.200	0.397	-0.021	67
fixed	School type (Unknown)	-0.306	0.369	-0.032	55
fixed	IDACI (1)	-0.587	0.038	-0.061	34
fixed	IDACI (2)	-0.470	0.036	-0.049	45
fixed	IDACI (3)	-0.312	0.036	-0.033	53
fixed	IDACI (4)	-0.112	0.035	-0.012	76
fixed	IDACI (6)	0.179	0.036	0.019	70
fixed	IDACI (7)	0.338	0.036	0.035	50
fixed	IDACI (8)	0.522	0.036	0.055	37
fixed	IDACI (9)	0.665	0.036	0.070	29
fixed	IDACI (10)	0.873	0.036	0.091	22
fixed	IDACI (Unknown)	-0.261	0.073	-0.027	59
fixed	**COVID-19 year**	**3.427**	**0.016**	**0.358**	**4**
fixed	FSM	-0.819	0.028	-0.086	23
fixed	FSM (Unknown)	0.205	0.101	0.021	66
fixed	**EPQ same year * Prior attainment**	**1.140**	**0.072**	**0.119**	**12**
fixed	EPQ earlier year * Prior attainment	0.970	0.201	0.101	17
fixed	EPQ same year * Prior attainment (squared)	-0.291	0.065	-0.030	56
fixed	EPQ earlier year * Prior attainment (squared)	0.051	0.189	0.005	80
fixed	**EPQ same year * Male**	**1.259**	**0.052**	**0.132**	**11**

fixed	EPQ earlier year * Male	0.963	0.146	0.101	18
fixed	EPQ same year * Asian/Asian British	-0.946	0.076	-0.099	20
fixed	EPQ earlier year * Asian/Asian British	-1.035	0.209	-0.108	16
fixed	EPQ same year * Black/Black British	-0.199	0.127	-0.021	68
fixed	EPQ earlier year * Black/Black British	-0.497	0.318	-0.052	41
fixed	EPQ same year * Mixed	0.234	0.151	0.024	63
fixed	EPQ earlier year * Mixed	0.690	0.439	0.072	27
fixed	EPQ same year * Ethnicity (Other)	-0.563	0.203	-0.059	35
fixed	EPQ earlier year * Ethnicity (Other)	-0.617	0.600	-0.065	32
fixed	EPQ same year * Ethnicity (Unknown/Undisclosed)	-0.126	0.116	-0.013	74
fixed	EPQ earlier year * Ethnicity (Unknown/Undisclosed)	-0.361	0.350	-0.038	49
fixed	EPQ same year * Community & Foundation	0.157	0.102	0.016	72
fixed	EPQ earlier year * Community & Foundation	0.039	0.241	0.004	82
fixed	EPQ same year * Free	-0.095	0.275	-0.010	78
fixed	EPQ earlier year * Free	-0.692	0.819	-0.072	26
fixed	EPQ same year * Voluntary Aided/Controlled	-0.513	0.127	-0.054	38
fixed	EPQ earlier year * Voluntary Aided/Controlled	-0.962	0.358	-0.101	19
fixed	EPQ same year * FE/Sixth Form Colleges	-0.792	0.063	-0.083	24
fixed	**EPQ earlier year * FE/Sixth Form Colleges**	**-1.890**	**0.181**	**-0.198**	**8**
fixed	EPQ same year * School type (Other)	-3.556	0.724	-0.372	3
fixed	EPQ earlier year * School type (Other)	-3.877	1.858	-0.405	2
fixed	EPQ same year * School type (Unknown)	1.098	0.621	0.115	13
fixed	EPQ earlier year * School type (Unknown)	1.077	0.626	0.113	15
fixed	EPQ same year * IDACI (1)	-0.195	0.138	-0.020	69
fixed	EPQ earlier year * IDACI (1)	-0.945	0.378	-0.099	21
fixed	EPQ same year * IDACI (2)	-0.247	0.128	-0.026	62
fixed	EPQ earlier year * IDACI (2)	-0.437	0.341	-0.046	47
fixed	EPQ same year * IDACI (3)	-0.212	0.124	-0.022	64
fixed	EPQ earlier year * IDACI (3)	-0.501	0.337	-0.052	40
fixed	EPQ same year * IDACI (4)	-0.278	0.120	-0.029	57
fixed	EPQ earlier year * IDACI (4)	-0.112	0.328	-0.012	75
fixed	EPQ same year * IDACI (6)	-0.138	0.114	-0.014	73
fixed	EPQ earlier year * IDACI (6)	-0.268	0.320	-0.028	58
fixed	EPQ same year * IDACI (7)	-0.173	0.112	-0.018	71
fixed	EPQ earlier year * IDACI (7)	-0.207	0.310	-0.022	65
fixed	EPQ same year * IDACI (8)	-0.251	0.110	-0.026	61
fixed	EPQ earlier year * IDACI (8)	0.006	0.312	0.001	83
fixed	EPQ same year * IDACI (9)	-0.315	0.108	-0.033	52
fixed	EPQ earlier year * IDACI (9)	-0.108	0.308	-0.011	77
fixed	EPQ same year * IDACI (10)	-0.308	0.106	-0.032	54
fixed	EPQ earlier year * IDACI (10)	-0.062	0.304	-0.007	79
fixed	EPQ same year * IDACI (Unknown)	-0.507	0.366	-0.053	39
fixed	EPQ earlier year * IDACI (Unknown)	1.079	0.574	0.113	14
fixed	EPQ same year * COVID-19 year	0.759	0.051	0.079	25
fixed	EPQ earlier year * COVID-19 year	0.599	0.147	0.063	33
fixed	EPQ same year * FSM	0.473	0.117	0.049	44
fixed	EPQ earlier year * FSM	0.049	0.314	0.005	81
fixed	EPQ same year * FSM (Unknown)	-2.903	0.376	-0.303	7
fixed	EPQ earlier year * FSM (Unknown)	-3.180	0.995	-0.332	5

Effect	**Group**	**Variance**
Random	School Residual	6.18
Random	Student Residual	91.51

Appendix 3 - Technical notes to accompany the spatial analysis methodology and the qualitative study

This appendix can be found at **https://www.brookes.ac.uk/research/units/hss/projects/extended-project-qualification**.