

Are students who take the Extended Project Qualification better prepared for higher education?

Research Report

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Introduction

The Extended Project Qualification (EPQ) is available for students in Key Stage 5 (KS5), to be taken alongside other qualifications, such as A levels. It differs from most other academic qualifications at KS5 because it is not examined, but instead involves students undertaking an in-depth project in an area of their choosing. Students are required to plan the project, research and analyse sources of information, write up their analysis, draw conclusions and produce an evaluation of the processes involved. As such, it is promoted by exam boards as providing the skills required for university study or for work. Universities also seem to value the qualification, with many reducing their standard offers to students who have achieved a high grade in the EPQ (see, for example, <https://www.southampton.ac.uk/learnwithustransition/epq-support/admissions-policy.page>).

Previous research has demonstrated the potential benefits to students of taking an EPQ. On the quantitative side it has been shown to be associated with improved performance in other qualifications taken in KS5 (Gill, 2017a, Jones, 2016). Furthermore, Gill (2017b) found that taking an EPQ on top of other KS5 qualifications was associated with an increased probability of achieving at least an upper second-class degree. More recently, Dilnot, Macmillan & Wyness (2022) found that taking EPQ was associated with lower probability of dropping out, of repeating a year or of achieving below an upper second.

On the qualitative side, Stephenson & Isaacs (2019) surveyed undergraduate students who had taken an EPQ and teachers with experience of supervising the qualification. They concluded that both the students and teachers valued the EPQ, with teachers reporting that their students had become more self-confident and resilient. They also believed that the need to be self-sufficient was likely to be beneficial to their learning. Williamson & Vitello (2018) surveyed heads of departments in schools and colleges in 2017/18 and found that a large majority (86%) agreed that the EPQ was good preparation for university.

The main purpose of this research was to investigate whether students taking EPQ were better prepared for higher education (HE) than students not taking it. The following questions were addressed:

1. Are EPQ students more likely than non-EPQ students to progress to HE (after accounting for other factors likely to affect this, such as prior attainment)?
2. Are EPQ students less likely than non-EPQ students to drop-out of HE (after accounting for other factors)?
3. Is taking an EPQ associated with better degree performance (after accounting for other factors)?

This investigation is of particular interest now due to the increase in uptake of the qualification in recent years: between 2008 and 2016, the number of students taking it increased from 1,706 to 38,548 (He & Black, 2018). By 2019, this had increased to 45,687 (Gill, 2022).

Data and methods

The main source of data for this project was a dataset linking students between their records in the National Pupil Database (NPD) and in the Higher Education Statistics Agency (HESA) database. The NPD is administered by the Department for Education (DfE) and includes examination results for all students in all qualifications and subjects in schools and colleges

in England, as well as student and school background characteristics such as gender, ethnicity, level of income-related deprivation and school type. The HESA data has information on the students who attend universities in the UK. It includes details of the institution attended, the course subject and level, the degree classification obtained (where applicable) and some additional background characteristics, such as socio-economic status and level of parental education.

We requested the KS5 extract of the NPD for the 2015/16 linked to HESA data in 2016/17, 2017/18 and 2018/19. This enabled us to investigate the relationship between taking an EPQ and the probability of progression to HE, the probability of dropping out of HE and the probability of achieving a 'good' degree (first class or upper second class). For all the analyses, the NPD data was restricted to students who took at least one qualification equivalent in size to an A level and who were aged 17 or 18 at the start of the academic year.

For the analysis of progression to HE, we used the NPD data for 2015/16, matched to the HESA data for 2016/17, 2017/18 and 2018/19. This meant we were able to include students who had one or two years of deferment before progressing to HE. Students who were in the NPD data, but not in the HESA data for any of the three years were assumed not to have progressed to HE. It is possible that some of these students progressed in later years, or went to an HE institution in another country, but these are likely to be a small minority.

For the analysis of drop-out from HE, students who were present in the HESA data in one year (e.g., 2016/17) but were not present in the next year (e.g., 2017/18) were counted as having dropped out of HE. This is not a perfect measure, as some of these students may have transferred to a university in a different country or taken a year out (i.e., not dropped out), but we assumed that there will only be a very small number of such students. Two separate analyses of drop-out were undertaken. Firstly, students who dropped out in their first year and secondly, students dropping out either in year 1 or in year 2. For the first of these, students who started HE in 2017, but were not in the data for 2018, or students who started in 2018 (i.e., those who deferred a year), but were not in the data for 2019 were counted as drop-out. For the second analysis, students who started HE in 2017, but were either not in the data for 2018 or were in the data for 2018, but not 2019 were counted as drop-out.

For the analysis of degree class achieved, we used the NPD data for 2015/16 matched to the HESA data for 2018/19. This means that this analysis was limited to students who started HE immediately after finishing school and completed their degree in three years. This will include the majority of students, but we acknowledge that a significant proportion of students will not be included in this analysis.

For each of the research questions, descriptive analyses showing patterns of progression to and achievement in HE were undertaken. Then, we carried out regression analyses to fully account for the students' backgrounds when looking at how well EPQ prepared students for HE.

Regression analysis

For each of the research questions regression models were fitted. The first of these was a set of logistic regression models predicting the probability of students who completed their KS5 studies in 2016 progressing to HE within the next three years. We used a multilevel

model, as this accounted for the clustering of students within schools (leading to students within schools having, on average, more similar outcomes than students in different schools). For a more detailed description of multilevel logistic regressions see Goldstein (2011). The general form of the model was as follows:

$$\log\left(\frac{p_{ij}}{1-p_{ij}}\right) = \beta_0 + \beta_1 x_{1ij} + \beta_2 x_{2ij} + \dots + \beta_l x_{lij} + u_j + \varepsilon_{ij}$$

where p_{ij} is the probability of student i from school j progressing to HE, x_{1ij} to x_{lij} are the independent variables, β_0 to β_l are the regression coefficients, u_j is a random variable at school level, and ε_{ij} is the residual term.

The second set of logistic regression models predicted the probability of a student dropping out of HE in either their first or second year. There were two separate hierarchies within this data, with students clustered in schools and students clustered in HE institutions. This was accounted for by using a cross-classified multilevel model. The general form of the model was:

$$\log\left(\frac{p_{ijk}}{1-p_{ijk}}\right) = \beta_0 + \beta_1 x_{1ijk} + \beta_2 x_{2ijk} + \dots + \beta_l x_{lijk} + u_j + u_k + \varepsilon_{ijk}$$

where p_{ijk} is the probability of student i from school j and attending HE institution k dropping out of HE, x_{1ijk} to x_{lijk} are the independent variables, β_0 to β_l are the regression coefficients, u_j is a random variable at school level, u_k is a random variable at institution level, and ε_{ijk} is the residual term.

Similarly, the third set of models predicted the probability of achieving a first class degree (and separately the probability of achieving at least an upper-second class degree). A cross-classified multilevel model was employed with students nested in schools and in HE institutions. The general form of the model was:

$$\log\left(\frac{p_{ijk}}{1-p_{ijk}}\right) = \beta_0 + \beta_1 x_{1ijk} + \beta_2 x_{2ijk} + \dots + \beta_l x_{lijk} + u_j + u_k + \varepsilon_{ijk}$$

where p_{ijk} is the probability of student i from school j and achieving a first (or, separately, at least an upper second) in HE institution k .

The regression models were fitted using the *glmer* function in the R programming language. An example of the code used is shown in the appendix.

For each regression model, other contextual variables which were likely to have had an impact on the outcome variable were included. In each model we included gender, concurrent attainment, deprivation, ethnic group, first language, special educational needs (SEN) status, school type, school gender, and school mean KS5 attainment. Additionally, for the models predicting the probability of drop-out or the probability of achieving a good degree, we added students' socioeconomic classification, their parents' level of education, and the degree subject (all of which were in the HESA data).

Whilst none of these characteristics were directly relevant to any of the research questions being addressed, it was important that they were included in the models because it allows to be more confident that any significant effect of taking EPQ was genuine and not down to differences in the other factors. They were all characteristics which previous research (e.g., Chowdry, Crawford, Dearden, Goodman, Vignoles, 2008; Gill, 2017b; Vidal Rodeiro, 2019) found to be significant factors in determining the likelihood of progression, drop-out, and degree class achieved.

The measure of concurrent attainment was the students' average KS5 points score. This variable was already in the NPD data and was calculated by assigning a points score to each achieved grade¹ and averaging this across all KS5 qualifications taken by a student which were at least equivalent in size to an A level. The measure, therefore, excluded the grade achieved in EPQ (for those students who took it), as this is equivalent in size to an AS level.

Student deprivation was measured by the Income Deprivation Affecting Children Index (IDACI), which indicates the proportion of children in a very small geographical area (Lower Layer Super Output Area or LSOA) living in low-income families². This variable was available in the NPD. It varies between 0 and 1 and indicates how income deprived the area is that they live in (although it cannot tell us how income deprived the student actually is).

We used the ethnicity categories in the NPD to group students by their ethnic background: Asian, black, Chinese, mixed, white, other, and unclassified. Chinese students were in a category of their own due to a well-known tendency to perform very well compared to other Asian students. Students were also grouped by their first language (English or other).

For the students with SEN, we used the categories in the NPD. These were 'SEN, no statement', and 'SEN, with statement', with the second of these indicating children requiring the most support³.

These four variables (deprivation, ethnicity, first language, and SEN) were collected as part of the school census, using information provided by schools. However, independent schools and colleges were not required to provide this information, leading to large amounts of missing data from these school types. Table 1 shows the total number of students in each dataset used to answer the research questions and the number and percentage of students with missing data. Students with missing data for any of these variables were excluded from any analysis involving the variables.

¹ For example, the scores for A level grades were: A*=300, A=270, B=240, C=210, D=180, E=150, U=0

² For further information on IDACI calculation, including definitions of children, families, and income deprivation, see Smith *et al* (2015)

³ A statement of special educational needs is a legal document which outlines the educational needs of the child and how they will be met by the local education authority.

Table 1: Extent of missing data for school census variables

Dataset	Total number of students	Students with missing data (n)	Students with missing data (%)
Progression to HE	405,296	220,769	54.7
Drop-out (Y1)	267,342	129,754	48.5
Drop-out (Y1 or Y2)	210,999	96,102	45.5
HE achievement	107,013	47,951	44.8

For the analysis by school type, schools were grouped into five categories: comprehensive (including academies and secondary moderns), colleges (further education / tertiary / sixth form), independent schools, selective schools, and other schools.

Schools were also categorised by their 'gender' (i.e., boys, girls, or mixed). This variable was derived from the percentage of girls in each school. If this was greater than 95% then the school was categorised as a girls school, if it was less than 5% it was categorised as a boys school. Otherwise, it was categorised as a mixed school.

For the school KS5 attainment measure, we calculated the average KS5 points score (as described above) amongst all students in each school.

The socioeconomic classification variable in the HESA data indicated the classification of the student if they were 21 or over or the classification of their parents if under 21. The categories used are standard categories used in the UK census, which run from 1 ('Higher managerial & professional occupations') to 8 ('Never worked & long-term unemployed'), with 9 indicating 'not classified' (including students)⁴.

The HESA data also included a variable indicating whether students' parents had HE qualifications (e.g., degree, diploma, or certificate of HE).

Finally, the degree subject group was included in some models. HESA used a system called JACS (Joint Academic Coding System) to classify subjects into one of 18 different subject groups⁵. For students taking combinations of subjects in different subject groups we applied the following rule: if the percentage of the course within one subject group was greater than 50%, then assign the student to that group; otherwise assign the student to an additional group called 'Combined'.

Results

RQ1: Are EPQ students more likely than non-EPQ students to progress to HE?

We start with some descriptive statistics on the number and percentage of EPQ and non-EPQ students progressing to HE, broken down by background characteristics. Table 2

⁴ For a full list of the different categories, see the [HESA website](#)

⁵ For a full list of subjects in each subject group, see <https://www.hesa.ac.uk/support/documentation/jacs/jacs3-detailed>

shows the overall numbers and percentages. This is amongst students who finished KS5 in 2017.

Table 2: EPQ and non-EPQ students progressing to HE

Started HE	EPQ n	EPQ %	Non-EPQ n	Non-EPQ %
2017	28,602	74.5	182,397	49.7
2018	4,757	12.4	51,586	14.1
2019	649	1.7	10,956	3.0
All years	34,008	88.5	244,939	66.8
Did not progress	4,410	11.5	121,939	33.2

This shows that 88.5% of EPQ students went on to HE (within the next 3 academic years), compared with 66.8% of students who did not take an EPQ. It is also interesting to note that a higher proportion of non-EPQ students than EPQ students progressed to HE after deferring for one or two years.

Table 3 presents the percentages of EPQ and non-EPQ students progressing (and the difference between these), broken down by student and school characteristics. This table also shows the percentage of students in each category taking the EPQ.

Table 3: EPQ and non-EPQ students progressing to HE, by student characteristics

Category		Candidates	% taking EPQ	% EPQ progressing	% non-EPQ progressing	Difference in % progressing	% all progressing
Gender	Female	212,355	10.9	89.7	69.9	19.8	72.0
	Male	192,941	7.9	86.8	63.5	23.3	65.3
School type	College	177,210	5.8	87.4	55.5	31.9	57.3
	Comp / Acad.	154,942	11.7	87.1	73.7	13.4	75.3
	Independent	37,448	10.9	91.0	84.4	6.6	85.1
	Selective	23,523	21.8	94.6	89.3	5.3	90.5
	Other	10,505	8.4	85.1	65.1	20.0	66.8
Ethnic group	Asian	21,668	11.6	93.6	87.5	6.1	88.2
	Black	10,507	9.7	93.7	87.9	5.8	88.5
	Chinese	1,349	15.5	97.1	91.7	5.4	92.5
	Mixed	8,197	11.5	91.6	79.8	11.8	81.2
	White	137,205	13.4	87.5	71.5	16.0	73.7
	Other	3,235	10.5	92.9	87.2	5.7	87.8
	Unclassified	2,366	10.7	92.9	75.9	17.0	77.7
First language	English	156,279	13.2	88.2	73.3	14.9	75.2
	Other	27,536	10.9	92.9	86.2	6.7	87.0
	Unclassified	712	10.7	89.5	77.5	12.0	78.8
SEN status	None	175,395	13.0	89.0	75.6	13.4	77.3
	SEN, no statement	7,859	10.5	85.6	69.4	16.2	71.1
	SEN with statement	1,222	11.0	79.9	65.1	14.8	66.7
School gender	Boys	11,788	10.2	93.0	76.3	16.7	78.0
	Girls	18,630	17.5	93.8	86.4	7.4	87.7
	Mixed	374,878	9.1	87.9	65.6	22.3	67.6

This shows that, within each student category, EPQ students were more likely to progress to HE than non-EPQ students. However, it is notable that the difference was generally larger for categories where the overall percentage progressing was lower. For example, selective school students had an overall progression rate of 90.5%, with a difference between EPQ and non-EPQ students of 5.3 percentage points. In contrast, college students had a much lower overall progression rate of 57.3%, with a difference between EPQ and non-EPQ students of 31.9 percentage points. This suggests that taking an EPQ may be more beneficial (in terms of the likelihood of progressing) for student groups with lower overall progression rates.

For the non-categorical variables of interest, we present summary statistics, broken down by whether students took EPQ and by whether they progressed to HE. Table 4 presents this data for the mean KS5 point score variable.

Table 4: Mean KS5 points score, for EPQ and non-EPQ students progressing and not progressing to HE

Taking EPQ?	Progressing to HE?	Students	Mean of KS5 points score mean	SD of KS5 points score mean
No	No	121,939	202.52	39.91
	Yes	244,939	228.37	36.06
Yes	No	4,410	209.91	42.25
	Yes	34,008	238.59	35.29

This shows that students taking EPQ and those progressing to HE had a higher mean KS5 points score on average. It also shows that the difference between not progressing and progressing students was slightly larger for EPQ students than non-EPQ students.

Table 5 presents the same data for students' IDACI score and Table 6 for the mean KS5 points score at school level.

Table 5: IDACI score, for EPQ and non-EPQ students progressing and not progressing to HE

Taking EPQ?	Progressing to HE?	Students	Mean IDACI score	SD IDACI score
No	No	39,676	0.172	0.128
	Yes	120,716	0.164	0.127
Yes	No	2,649	0.155	0.118
	Yes	20,996	0.141	0.115

Students taking EPQ and those progressing to HE had lower IDACI scores. However, there was a bigger difference in IDACI between those progressing and those not doing so for the EPQ students (0.14) than for the non-EPQ students (0.08).

Table 6: School mean KS5 point score, for EPQ and non-EPQ students progressing and not progressing to HE

Taking EPQ?	Progressing to HE?	Students	Mean of school KS5 points score mean	SD of school KS5 points score mean
No	No	121,939	216.15	13.21
	Yes	244,939	224.20	15.93
Yes	No	4,410	222.52	14.93
	Yes	34,008	228.43	15.45

Students progressing to HE and those taking an EPQ attended schools with higher mean KS5 points score, on average.

Finally, Table 7 presents the number and the percentage of students progressing to HE by their EPQ grade.

Table 7: Students progressing to HE, by EPQ grade

EPQ grade	No of students	% students progressing
A*	6,897	95.4
A	9,176	94.0
B	8,232	90.3
C	6,629	84.6
D	3,793	80.2
E	1,890	74.8
U	832	68.4
X	969	76.3
Not taken	366,927	66.8

This shows a mainly consistent pattern, with higher percentages of students progressing for each higher EPQ grade (except for those achieving a grade X⁶). However, this measure had a substantial correlation with the A level mean (Pearson correlation coefficient = 0.462, n=38,418) which may partly explain why progression was higher amongst students achieving higher grades.

The results of the regression analyses are presented in Table 8. This shows the parameter estimates (with standard errors in brackets). Statistical significance (at the 5% level) is indicated by an asterisk⁷.

Several different models were run. Model 1 included just the student level variables, model 2 added in the school level variables, and model 3 added in any significant interaction effects

⁶ A grade X means 'no result' and could be for several reasons, including the candidate failing to complete work for all components, failing to provide an internal assessment sample, an incorrect combination of components, or a script not being available to be marked (OCR, 2016).

⁷ By statistically significant at 5% level, we mean that the p-value for the parameter was less than 0.05. The definition of p-value is as follows: if the true value of this parameter in the population was zero, the p-value is the probability that (by random sampling) we would get a value which was equal to or more extreme than the observed value.

between EPQ and the other predictor variables. Model 4 excluded the census variables because these had a lot of missing data and we wanted to check whether including these students changed the results of the models in a meaningful way. Finally, model 5 included a term for the grade achieved in the EPQ, which replaced the binary variable of taking an EPQ. The purpose of this model was to investigate whether achieving a higher grade in the EPQ was associated with an increased probability of progression.

For the regression models it was necessary to combine some of the school type categories. This was because the model failed to converge when all categories were used. We combined independent and selective schools into one category and all other school types into another category.

Table 8: Results of regression, predicting the probability of progressing to HE (Model 1=student level variables, 2=school level variables, 3=interactions, 4=excluding census variables, 5=including EPQ grade)

Fixed effects		Model 1 (n=183,979)	Model 2 (n=183,979)	Model 3 (n=183,979)	Model 4 (n=403,725)	Model 5 (n=183,979)
Intercept		1.020 (0.018)*	0.955 (0.019)*	0.949 (0.019)*	1.018 (0.020)*	0.953 (0.019)*
Taken EPQ	No					
	Yes	0.949 (0.026)*	0.937 (0.026)*	0.997 (0.029)*	0.981 (0.020)*	
EPQ grade	N/A					
	A*					1.462 (0.088)*
	A					1.356 (0.061)*
	B					1.137 (0.052)*
	C					0.798 (0.047)*
	D					0.660 (0.056)*
	E					0.444 (0.076)*
	U					0.185 (0.112)
X					0.414 (0.124)*	
Mean KS5 points score		0.018 (0.000)*	0.017 (0.000)*	0.017 (0.000)*	0.017 (0.000)*	0.017 (0.000)*
Gender	Female					
	Male	-0.172 (0.013)*	-0.170 (0.013)*	-0.170 (0.013)*	-0.132 (0.008)*	-0.166 (0.013)*
IDACI score		-0.732 (0.060)*	-0.695 (0.060)*	-0.696 (0.060)*		-0.691 (0.060)
Ethnic group	White					
	Asian	0.875 (0.031)*	0.864 (0.031)*	0.889 (0.031)*		0.865 (0.031)*
	Black	1.241 (0.037)*	1.240 (0.037)*	1.262 (0.037)*		1.243 (0.037)*
	Chinese	0.950 (0.112)*	0.933 (0.112)*	0.934 (0.112)*		0.933 (0.112)*
	Mixed	0.460 (0.032)*	0.458 (0.032)*	0.468 (0.033)*		0.458 (0.032)*
	Other	0.840 (0.062)*	0.840 (0.062)*	0.868 (0.064)*		0.841 (0.062)*
	Unclassified	0.364 (0.061)*	0.359 (0.061)*	0.355 (0.062)*		0.363 (0.060)*
First language	English		0			
	Other	0.390 (0.026)*	0.399 (0.026)*	0.398 (0.026)*		0.398 (0.026)*
	Unclassified	0.004 (0.108)	0.010 (0.108)	0.008 (0.108)		0.012 (0.108)

Fixed effects		Model 1 (n=183,979)	Model 2 (n=183,979)	Model 3 (n=183,979)	Model 4 (n=403,725)	Model 5 (n=183,979)
SEN status	None					
	SEN, no statement	-0.183 (0.029)*	-0.187 (0.029)*	-0.187 (0.029)*		-0.183 (0.029)*
	SEN, with statement	-0.158 (0.069)*	-0.147 (0.069)*	-0.148 (0.069)*		-0.146 (0.070)*
School type	Comp / College					
	Ind / Sel		0.830 (0.065)*	0.859 (0.065)*	0.396 (0.045) *	0.819 (0.064) *
School gender	Mixed					
	Boys		-0.052 (0.091)	-0.057 (0.091)	0.051 (0.084)	-0.052 (0.090)
	Girls		0.126 (0.072)	0.132 (0.072)	0.239 (0.064)*	0.118 (0.071)*
School mean KS5 point score			0.005 (0.001)*	0.005 (0.001)*	0.010 (0.001)*	0.005 (0.001)*
Taken EPQ*ethnic group	White					
	Asian			-0.362 (0.095)*		
	Black			-0.358 (0.141)*		
	Chinese			-0.017 (0.439)		
	Mixed			-0.136 (0.132)		
	Other			-0.418 (0.230)		
Unclassified			0.123 (0.263)			
Taken EPQ*school type	Comp / College					
	Ind / Sel			-0.229 (0.085)*		

The results of the regressions show a significant positive effect of taking EPQ on the likelihood of progressing to HE. The size of the effect was similar in models 1 to 4, between 0.949 and 0.997. This shows that the exclusion of students with no record for census variables (model 4) had little effect on the outcomes.

Interpretation of parameter estimates in logistic regression models is not straightforward, as they represent the log of the odds of progressing. However, we can make comparisons by converting the results to predicted probabilities of progressing for specific groups of students. These students will be referred to in the rest of the report as ‘typical’ students, and they refer to those who were in the base category for all categorical variables⁸, and with a value of the continuous variables (mean KS5 points score, IDAC1 score and centre mean KS5 point score) equal to the mean amongst all students.

Figure 1 presents the probabilities for students with different mean KS5 points scores and whether they took EPQ. This is for typical students (except that their mean KS5 points score could vary), using the results of model 3 in Table 8.

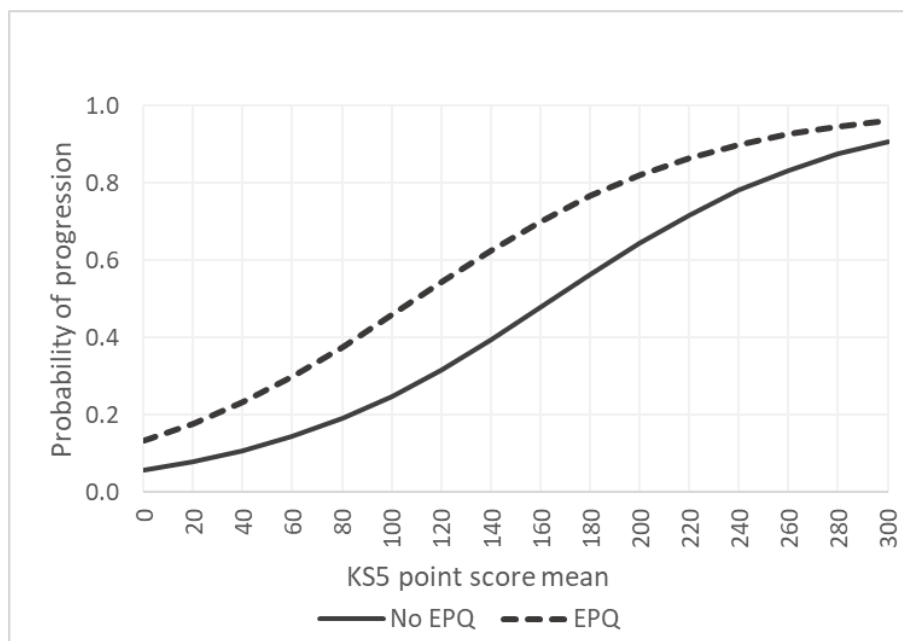


Figure 1: Predicted probabilities of progressing to HE by EPQ and KS5 mean points score

This illustrates the size of the difference in probability between EPQ and non-EPQ students. For example, for students with a mean KS5 points score of equal to the mean amongst all students (220, equivalent to one B grade and two C grades at A level), the probability was 0.87 for EPQ students and 0.72 for non-EPQ students.

The results of model 5 showed a consistent pattern, with higher EPQ grade associated with greater likelihood of progressing. Compared with students not taking EPQ, every grade had a significant and positive impact on the probability of progressing (apart from grade U). This effect was over and above any effect of KS5 attainment, as this was accounted for in the model.

⁸ Meaning a student who was female, white, English speaking, had no SEN, attended a comprehensive school or college, and attended a mixed sex school

Figure 2 shows the probabilities for typical students achieving each EPQ grade. There was very little difference in the probabilities for grades A* to B, which suggests that there was not much additional effect of achieving above a grade B.

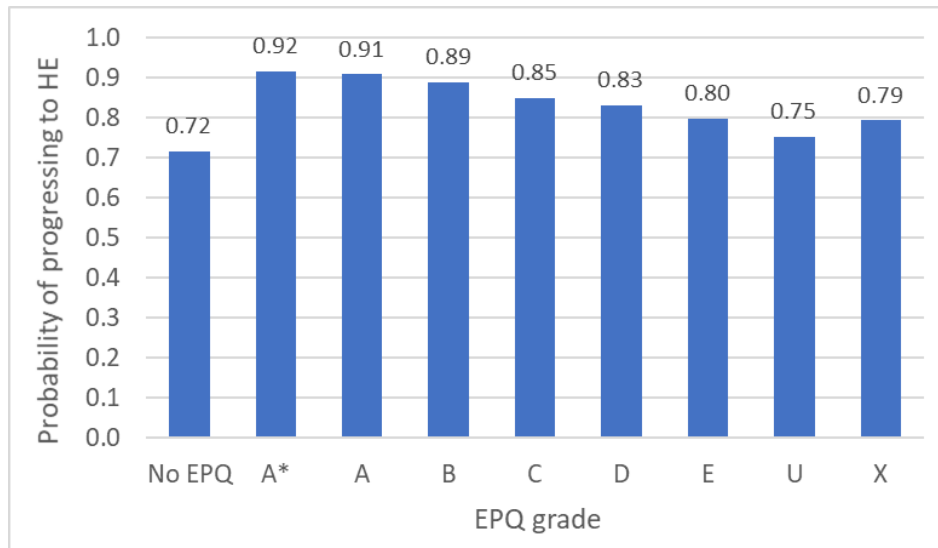


Figure 2: Predicted probabilities of progressing to HE by EPQ grade

It was also interesting that there was a significant positive effect of taking EPQ and only achieving a grade X, compared with not taking EPQ. This may be because even starting (but not finishing) an EPQ was beneficial.

There were two interaction effects which were statistically significant. The first of these was between ethnic group and taking EPQ. The negative parameter estimates for Asian and for black students mean that the positive effect of taking EPQ was less for these students than for the reference group (white students). This effect is illustrated in Figure 3 which shows the probabilities for typical students. The increase in probability for EPQ students was larger for white students (from 0.72 to 0.87) than for students from other ethnic backgrounds.

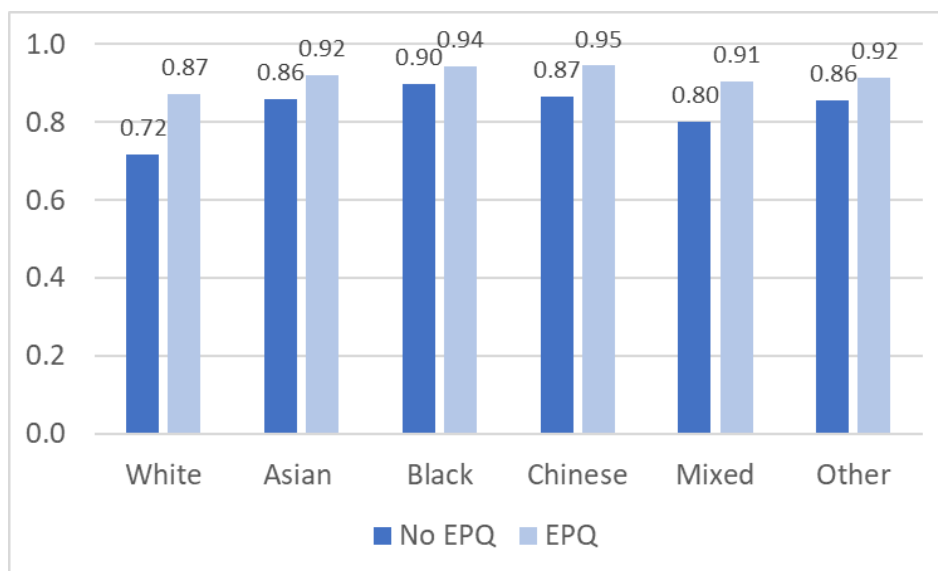


Figure 3: Predicted probabilities of progressing to HE by EPQ and ethnicity

The second significant interaction was between school type and taking EPQ, with the negative estimate for independent / selective schools indicating that the effect of taking EPQ was less for students in these schools. This is illustrated in Figure 4.

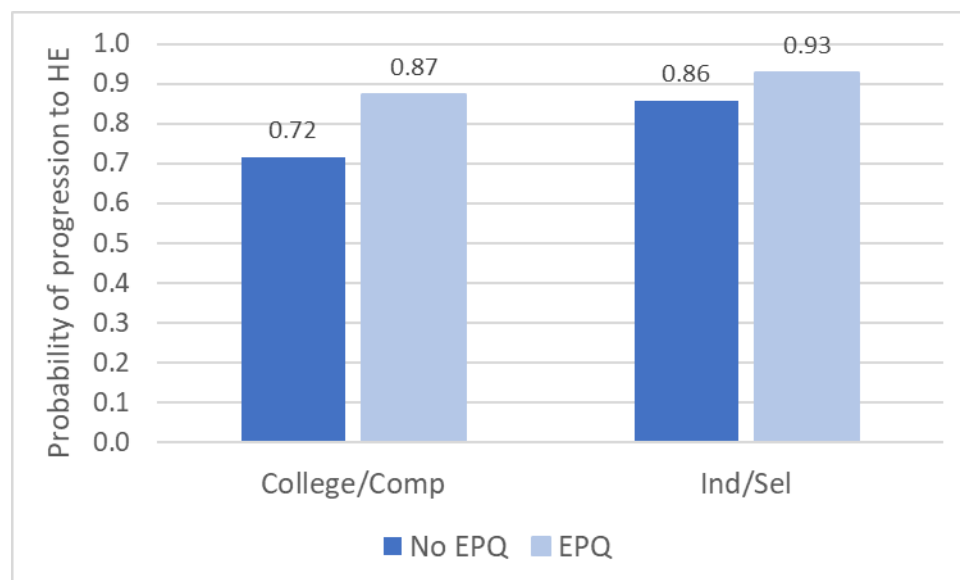


Figure 4: Predicted probabilities of progressing to HE by EPQ and school type

This shows that the increase in probability from taking EPQ was more for students attending college or comprehensive schools (from 0.72 to 0.87) than for those at independent or selective schools (from 0.86 to 0.93).

RQ2: Are EPQ students more likely than non-EPQ students to drop-out?

For this analysis, we investigated the probability of drop-out in year 1 separately from the probability of drop-out by the end of year 2 (i.e., in year 1 or year 2).

Drop out in year 1

Table 9 presents the number and percentage of EPQ and non-EPQ students dropping out in year 1. This shows that non-EPQ students were more likely to drop out in their first year (5%) than EPQ students (2.3%).

Table 9: EPQ and non-EPQ students dropping out, by year started HE

Started HE	EPQ students dropping out	EPQ %	Non-EPQ students dropping out	Non-EPQ %
2017	646	2.3	9,002	4.9
2018	128	2.7	2,715	5.3
All	774	2.3	11,717	5.0
Did not drop out	32,585	97.7	222,266	95.0

Table 10 presents the percentages of EPQ and non-EPQ students dropping out in year 1 (and the difference between these two), broken down by student and school characteristics. This also shows the percentage of students in each category taking the EPQ.

This shows that in every category, EPQ students were less likely to drop out than non-EPQ students. The biggest differences were for male students, those attending a college or a mixed gender school, mixed race students, those whose parents were not educated at HE, and those in socioeconomic classes 4 to 7.

Table 10: EPQ and non-EPQ students dropping out in year 1, by background characteristics

Category		Candidates	% taking EPQ	% EPQ dropping out	% non-EPQ dropping out	Difference in % dropping out	% all dropping out
Gender	Female	146,831	13.9	2.1	4.5	-2.4	4.2
	Male	120,511	10.8	2.6	5.6	-3.0	5.3
School type	College	95,821	8.9	2.5	6.7	-4.2	6.3
	Comp / Acad.	112,755	13.4	2.5	4.6	-2.1	4.3
	Independent	31,185	11.5	1.9	2.5	-0.6	2.4
	Selective	20,885	22.6	1.2	2.0	-0.8	1.8
	Other	6,721	10.8	4.9	6.4	-1.5	6.0
Ethnic group	Asian	18,753	12.4	1.1	3.4	-2.3	3.1
	Black	9,090	10.3	2.9	3.8	-0.9	3.7
	Chinese	1,228	16.4	-	-	-	2.3
	Mixed	6,462	13.2	1.3	4.1	-2.8	3.8
	White	97,501	16.2	2.5	4.6	-2.1	4.3
	Other	2,778	11.2	-	-	-	3.2
	Unclassified	1,776	13.0	-	-	-	4.5
First language	English	113,648	15.7	2.4	4.4	-2.0	4.1
	Other	23,404	11.8	1.3	3.8	-2.5	3.5
	Unclassified	536	12.7	0.0	3.9	-3.9	3.4
SEN status	None	131,483	15.1	2.2	4.3	-2.1	4.0
	SEN, no statement	5,322	12.9	2.8	5.1	-2.3	4.8
	SEN with statement	760	14.1	-	-	-	6.3
School gender	Boys	8,953	12.2	1.7	2.8	-1.1	2.6
	Girls	16,055	18.8	1.3	2.2	-0.9	2.1
	Mixed	242,334	12.0	2.5	5.3	-2.8	4.9
Parent educated at HE?	Yes	124,233	14.7	1.8	3.7	-1.9	3.4
	No	107,191	11.0	2.7	5.9	-3.2	5.6
	Don't know / not available	33,802	9.4	2.9	6.0	-3.1	5.7
Socio-economic class. (1=high, 8=low, 9=Not classified)	1	63,917	15.9	1.7	3.2	-1.5	3.0
	2	60,761	13.8	2.0	4.5	-2.5	4.1
	3	28,228	12.1	2.7	5.0	-2.3	4.8
	4	19,648	10.3	1.9	5.6	-3.7	5.2
	5	11,726	11.6	2.0	5.9	-3.9	5.4
	6	24,863	9.5	3.2	6.5	-3.3	6.2
	7	15,949	9.3	3.0	6.5	-3.5	6.2
	8	749	6.8	-	-	-	9.9
	9	36,936	10.2	3.0	5.4	-2.4	5.1

Tables 11 to 13 present the mean and standard deviations for the non-categorical background variables. Students taking an EPQ and those not dropping out had a higher

mean KS5 point score, a lower IDACI score and attended schools with higher mean KS5 point score, on average.

Table 11: Mean KS5 point score, by whether student dropped out in year 1 and by EPQ uptake

Taking EPQ?	Drop-out in Y1	Students	Mean of KS5 point score mean	SD of KS5 point score mean
No	No	222,266	229.81	35.30
	Yes	11,717	218.85	36.21
Yes	No	32,585	239.50	34.74
	Yes	774	220.39	40.10

Table 12: Mean IDACI score, by whether student dropped out in year 1 and by EPQ uptake

Taking EPQ?	Drop-out in Y1	Students	Mean IDACI score	SD IDACI score
No	No	111,561	0.163	0.126
	Yes	5,054	0.191	0.136
Yes	No	20,164	0.141	0.115
	Yes	466	0.163	0.126

Table 13: School mean KS5 point score, by whether student dropped out in year 1 and by EPQ uptake

Taking EPQ?	Drop-out in Y1	Students	Mean of centre KS5 point score mean	SD of centre KS5 point score mean
No	No	222,266	224.71	16.06
	Yes	11,717	219.69	13.66
Yes	No	32,585	228.58	15.45
	Yes	774	224.48	14.87

Table 14 shows the drop-out rate and the percentage of students taking EPQ, by degree subject area. For all subjects, EPQ students were less likely to drop out than non-EPQ students. The biggest differences between EPQ and non-EPQ students were for computer sciences (-4.2 percentage points), biological sciences (-3.7 p.p.), and mass communications (-3.3 p.p.). The smallest differences were for architecture, building and planning (-0.6 p.p.), mathematical sciences (-0.7 p.p.), and languages (-1.2 p.p.).

Table 14: Drop-out by degree subject group and EPQ

Subject group	Students	% taking EPQ	% EPQ dropping out	% non-EPQ dropping out	Difference in % dropping out	% all dropping out
Medicine / dentistry	4,856	27.6	-	-	-	0.6
Subjects allied to med	18,968	11.3	1.9	4.1	-2.2	3.9
Biological Sciences	33,939	12.3	2.1	5.8	-3.7	5.3
Veterinary Science	620	25.2	-	-	-	-
Agriculture	1,902	10.4	-	-	-	8.2
Physical Sciences	13,110	16.0	1.3	2.9	-1.6	2.6
Mathematical Sciences	6,452	10.9	2.1	2.8	-0.7	2.7
Computer Sciences	12,799	8.0	3.4	7.6	-4.2	7.3
Engineering / Technology	16,139	11.2	2.0	5.1	-3.1	4.7
Architecture, Building & Planning	4,708	10.7	3.6	4.2	-0.6	4.2
Social Studies	25,868	14.0	2.5	4.3	-1.8	4.1
Law	11,162	16.3	2.0	4.2	-2.2	3.8
Business / Administrative Studies	30,069	7.4	3.1	5.9	-2.8	5.7
Mass Communications	6,970	10.1	3.1	6.4	-3.3	6.1
Languages	12,970	19.0	2.0	3.2	-1.2	3.0
Historical / Philosophical Studies	11,436	21.5	1.8	3.2	-1.4	2.9
Creative Arts & Design	28,702	8.1	4.4	6.6	-2.2	6.5
Education	7,280	9.6	3.2	5.6	-2.4	5.3
Combined	19,272	14.9	2.0	4.2	-2.2	3.9

Table 15 presents the number and the percentage of students dropping out by their EPQ grade. This shows that students with higher EPQ grades were less likely to drop out, and this pattern held across all grades. However, EPQ grade correlated substantially with the A level mean (Pearson correlation coefficient = 0.451, n=33,359) which may partly explain why drop-out rate was lower amongst students achieving higher grades. Compared with students not taking EPQ, only those achieving a grade X were more likely to drop out.

Table 15: Drop-out rate by EPQ grade

EPQ grade	No of students	% students dropping out (Y1)
A*	6,520	1.2
A	8,498	1.6
B	7,289	2.0
C	5,478	3.0
D	2,949	4.0
E	1,366	4.7
U	548	4.9
X	711	5.9
Not taken	233,998	5.0

The results of the regression analyses are presented in Table 16. As with the analysis of progression, we fitted 5 different models. In this table a negative parameter estimate indicates a lower probability of dropping out. For example, in each model the parameter estimate for the EPQ indicator was about -0.5, indicating that taking EPQ was associated

with a lower probability of dropping out. In terms of EPQ grade, students achieving a grade A or B had the lowest probability of dropping out. Interestingly, this was lower than the probability for those achieving a grade A* (Model 5).

It is worth noting that the size of the EPQ parameter estimate for in model 4 (which excluded census variables) was very similar to model 2, (i.e., the equivalent model, excluding the significant interaction shown in model 3). This shows that the exclusion of students with no record for census variables (model 4) had little effect on the outcomes.

Table 16: Results of regressions modelling the probability of drop-out in year 1 (model 1= student factors, 2=school factors, 3=interactions, 4=excluding census variables, 5=EPQ grade)

Fixed effects		Model 1 (n=135,363)	Model 2 (n=135,363)	Model 3 (n=135,362)	Model 4 (n=261,075)	Model 5 (n=135,362)
Intercept		-4.480 (0.300)*	-4.314 (0.300)*	-4.336 (0.270)*	-4.460 (0.196)*	-4.340 (0.270)
Taken EPQ	No					
	Yes	-0.491 (0.056)*	-0.475 (0.057)*	-0.524 (0.055)*	-0.461 (0.041)*	
EPQ grade	n/a					
	A*					-0.557 (0.156)*
	A					-0.689 (0.122)*
	B					-0.692 (0.112)*
	C					-0.509 (0.107)*
	D					-0.304 (0.123)*
	E					-0.068 (0.164)
	U					-0.233 (0.278)
X					0.335 (0.222)	
Mean KS5 point score		-0.005 (0.001)*	-0.005 (0.001)*	-0.004 (0.001)*	-0.003 (0.000)*	-0.004 (0.000)*
Gender	Female					
	Male	0.231 (0.035)*	0.224 (0.036)*	0.250 (0.032)*	0.248 (0.022)*	0.247 (0.032)*
IDACI score		1.240 (0.134)*	1.228 (0.134)*	1.162 (0.123)*		1.160 (0.123)*
Ethnic group	White					
	Asian	-0.471 (0.064)*	-0.456 (0.064)*	-0.464 (0.059)*		-0.464 (0.059)*
	Black	-0.469 (0.073)*	-0.475 (0.073)*	-0.412 (0.066)*		-0.416 (0.066)*
	Chinese	-0.577 (0.232)*	-0.551 (0.232)*	-0.434 (0.205)*		-0.434 (0.205)*
	Mixed	-0.181 (0.078)*	-0.179 (0.078)*	-0.171 (0.071)*		-0.172 (0.071)*
	Other	-0.583 (0.136)*	-0.585 (0.136)*	-0.470 (0.119)*		-0.473 (0.119)*
	Unclassified	0.033 (0.138)	0.029 (0.139)	0.029 (0.125)		0.021 (0.125)
First language	English					
	Other	-0.184 (0.056)*	-0.193 (0.056)*	-0.188 (0.051)*		-0.187 (0.051)*
	Unclassified	-0.231 (0.284)	-0.248 (0.284)	-0.348 (0.257)		-0.347 (0.257)
SEN status	None					

Fixed effects		Model 1 (n=135,363)	Model 2 (n=135,363)	Model 3 (n=135,362)	Model 4 (n=261,075)	Model 5 (n=135,362)
	SEN, no statement	0.073 (0.077)	0.079 (0.077)	0.019 (0.070)		0.019 (0.07)
	SEN + statement	0.186 (0.177)	0.177 (0.177)	0.177 (0.157)		0.174 (0.157)
Degree subject	Medicine / dentistry					
	Subjects allied to medicine	0.724 (0.301)*	0.641 (0.302)*	0.668 (0.270)*	0.857 (0.193)*	0.673 (0.270)*
	Biological Sciences	0.991 (0.297)*	0.903 (0.297)*	0.948 (0.266)*	1.125 (0.191)*	0.954 (0.266)
	Veterinary Science ⁹	n/a	n/a	n/a	0.001 (0.617)	n/a
	Agriculture	1.328 (0.358)*	1.246 (0.357)*	1.191 (0.322)*	1.369 (0.219)*	1.202 (0.322)*
	Physical Sciences	0.540 (0.306)	0.452 (0.306)	0.479 (0.274)	0.752 (0.197)*	0.485 (0.274)
	Mathematical Sciences	0.894 (0.312)*	0.805 (0.312)*	0.815 (0.281)*	0.938 (0.205)*	0.821 (0.281)*
	Computer Sciences	1.276 (0.300)*	1.184 (0.301)	1.159 (0.270)*	1.185 (0.193)*	1.163 (0.270)*
	Engineering / Technology	0.917 (0.302)*	0.835 (0.302)*	0.836 (0.271)*	1.142 (0.193)*	0.839 (0.271)*
	Architecture, Building & Planning	0.801 (0.321)*	0.722 (0.321)*	0.749 (0.287)*	0.791 (0.205)*	0.752 (0.287)*
	Social Studies	0.967 (0.298)*	0.879 (0.298)*	0.929 (0.267)*	1.066 (0.192)*	0.932 (0.267)*
	Law	0.760 (0.305)*	0.676 (0.305)*	0.713 (0.274)*	0.896 (0.196)*	0.718 (0.274)*
	Business / Administrative Studies	1.078 (0.297)*	0.991 (0.297)*	0.977 (0.266)*	1.094 (0.191)*	0.979 (0.266)*
	Mass Communications	0.993 (0.307)*	0.898 (0.307)*	0.959 (0.275)*	1.078 (0.197)*	0.960 (0.275)*
	Languages	0.919 (0.304)*	0.828 (0.304)*	0.891 (0.272)*	1.047 (0.196)*	0.895 (0.272)*
	Historical / Philosophical Studies	0.763 (0.305)*	0.672 (0.306)*	0.754 (0.273)*	0.926 (0.197)*	0.760 (0.273)*
	Creative Arts & Design	1.114 (0.299)*	1.020 (0.299)*	1.002 (0.268)*	1.186 (0.191)*	1.004 (0.268)*
	Education	0.870 (0.306)*	0.777 (0.306)*	0.774 (0.275)*	0.894 (0.197)*	0.778 (0.275)*
	Combined	0.902 (0.300)*	0.808 (0.300)*	0.877 (0.269)*	1.063 (0.193)*	0.880 (0.269)*
Socioeconomic classification	1					
	2	0.099 (0.051)	0.095 (0.051)	0.098 (0.046)*	0.129 (0.032)*	0.098 (0.046)*
	3	0.083 (0.062)	0.078 (0.062)	0.068 (0.056)	0.130 (0.038)*	0.069 (0.056)
	4	0.219 (0.068)*	0.212 (0.068)*	0.225 (0.061)*	0.166 (0.042)*	0.224 (0.061)*
	5	0.170 (0.078)*	0.163 (0.078)*	0.118 (0.072)	0.156 (0.049)*	0.118 (0.072)

⁹ For models 1-3 and 5, it was not possible to generate an estimate for veterinary science

Fixed effects		Model 1 (n=135,363)	Model 2 (n=135,363)	Model 3 (n=135,362)	Model 4 (n=261,075)	Model 5 (n=135,362)
	6	0.284 (0.063)*	0.274 (0.063)*	0.257 (0.057)*	0.254 (0.038)*	0.257 (0.057)*
	7	0.203 (0.072)*	0.191 (0.072)*	0.157 (0.066)*	0.192 (0.043)*	0.156 (0.066)*
	8	0.302 (0.245)	0.296 (0.245)	0.252 (0.222)	0.463 (0.130)*	0.252 (0.222)
	Not classified	0.315 (0.059)*	0.311 (0.060)*	0.273 (0.054)*	0.263 (0.035)*	0.272 (0.054)*
Parent educated to HE?	Yes					
	No	0.268 (0.038)*	0.262 (0.038)*	0.258 (0.035)*	0.232 (0.023)*	0.257 (0.035)*
	DK / unavailable	0.324 (0.054)*	0.322 (0.054)*	0.368 (0.048)*	0.298 (0.031)*	0.366 (0.048)*
School type	Acad / Comp					
	College		0.228 (0.745)	0.325 (0.612)	0.280 (0.032)*	0.346 (0.612)
	Independent		n/a	n/a	-0.123 (0.054)*	n/a
	Selective		-0.493 (0.079)*	-0.441 (0.072)*	-0.408 (0.068)*	-0.440 (0.072)*
	Other		0.083 (0.083)	0.113 (0.076)	0.130 (0.071)	0.111 (0.076)
School gender	Mixed					
	Boys		-0.217 (0.126)	-0.115 (0.111)	-0.154 (0.089)	-0.114 (0.111)
	Girls		-0.196 (0.092)*	-0.165 (0.085)*	-0.197 (0.069)*	-0.166 (0.085)
School mean KS5 point score			0.002 (0.001)	0.004 (0.002)*	-0.002 (0.001)*	-0.002 (0.001)
Taken EPQ*mean KS5 point score				-0.004 (0.001)*		

Figure 5 presents the predicted probabilities of dropping out, by KS5 mean points score and whether EPQ was taken. This was for the 'typical' students, using the results of model 3 in Table 16.

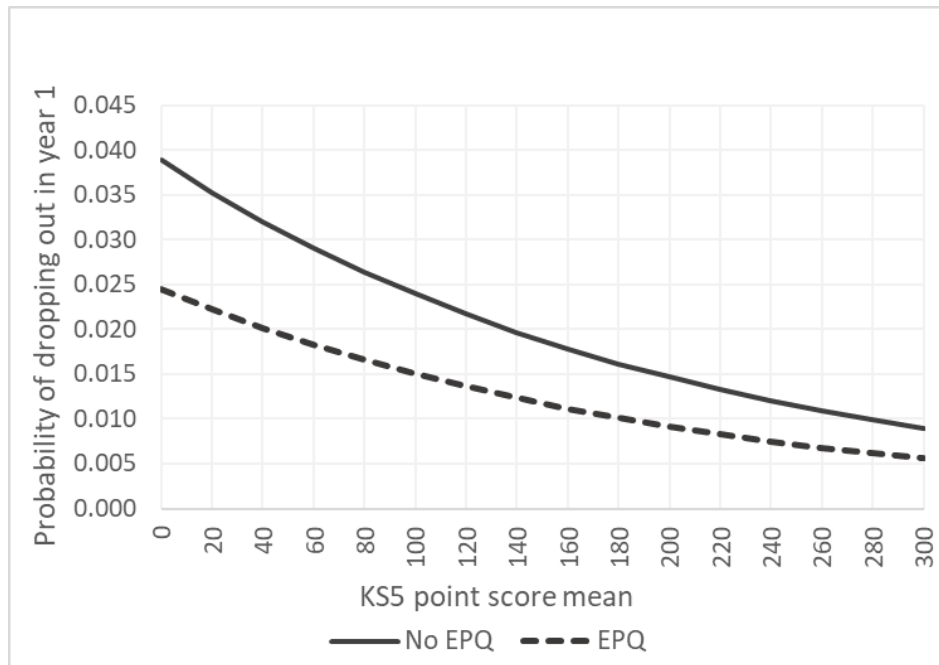


Figure 5: Predicted probabilities of drop-out in year 1, by EPQ and KS5 mean points score

This shows that the difference in the probability of drop-out was very small, despite it being statistically significant. For an EPQ student with a KS5 mean of 230 (equal to the mean amongst all students progressing to HE) the probability of dropping out was 0.008, compared with 0.013 for non-EPQ students.

Figure 6 presents the predicted probability by EPQ grade. This was for typical students with a mean KS5 points score of 230. This shows that the differences in drop-out rate were very small, although they were significant for grades A* to D, compared with not taking EPQ.

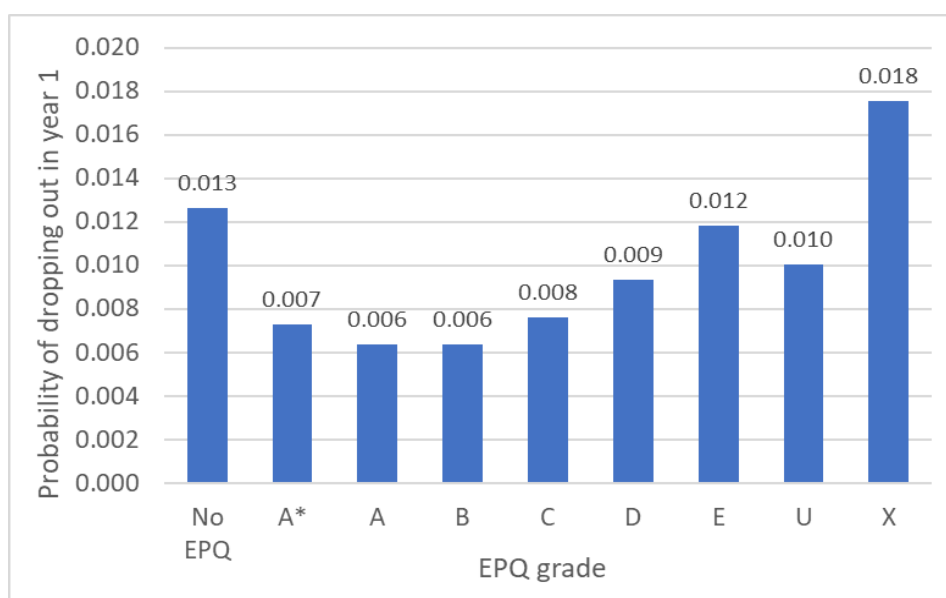


Figure 6: Predicted probabilities of drop-out in year 1 by EPQ grade

There was only one interaction effect that was statistically significant. This was between taking EPQ and mean KS5 points score, and this was a small negative effect (-0.004). This suggests that the effect of taking EPQ on the probability of dropping out was greater for students of higher ability. This is illustrated in Figure 7, which shows the probability of drop-out, by KS5 points score and whether EPQ was taken (for typical students, using the results of model 3). This suggests that for students with very low mean KS5 points score, the likelihood of dropping out was higher for EPQ students.

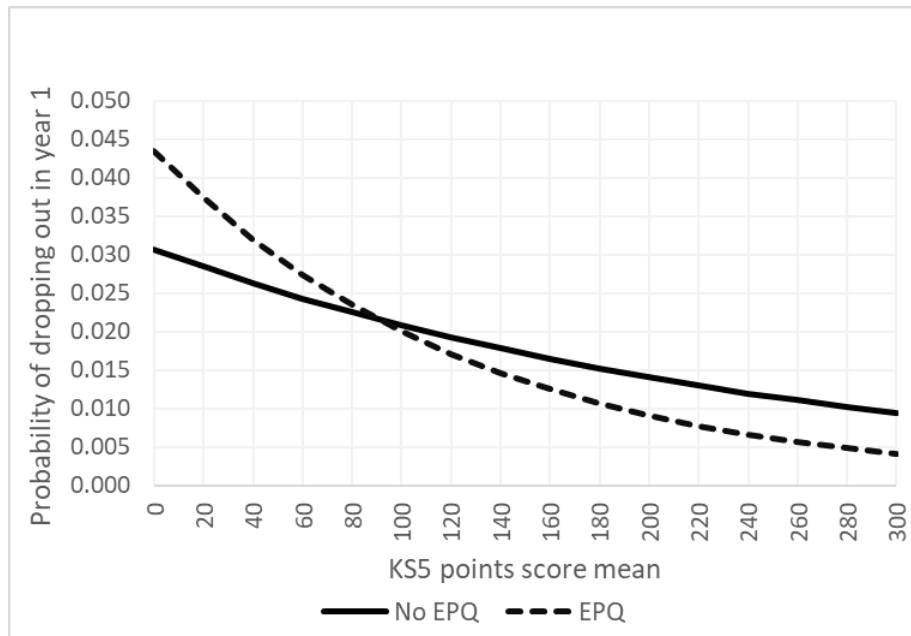


Figure 7: Predicted probabilities of drop-out in year 1, by EPQ and KS5 mean points score (including interaction effect between KS5 point score and drop-out)

EPQ and drop-out in year 1 or year 2

For this analysis of drop-out, students were categorised as dropping out in year 1 or year 2 if they appeared in the HESA dataset in 2017 but were not there in either 2018 or 2019.

Table 17 shows the percentage of EPQ and non-EPQ students dropping out. Table 18 presents the same data, by background characteristic.

Table 17: Percentage of EPQ and non-EPQ students dropping out in year 1 or year 2

Drop out	EPQ students	EPQ %	Non-EPQ students	Non-EPQ %
Yes	1,216	4.3	17,401	9.5
No	27,386	95.8	164,996	90.5

Table 18: EPQ and non-EPQ students dropping out of HE by year 2, by background characteristics

Category		Candidates	% taking EPQ	% EPQ dropping out	% non-EPQ dropping out	Difference in % dropping out	% all dropping out
Gender	Female	116,462	15.0	3.7	8.2	-4.5	7.5
	Male	94,537	11.8	5.1	11.2	-6.1	10.4
School type	College	71,314	10.2	4.7	13.3	-8.6	12.4
	Comp / Acad.	94,039	14.5	4.9	8.7	-3.8	8.2
	Independent	22,191	13.0	2.9	4.2	-1.3	4.0
	Selective	17,594	23.7	2.1	3.5	-1.4	3.2
	Other	5,534	11.7	5.6	11.4	-5.8	10.7
Ethnic group	Asian	16,266	12.8	2.9	7.0	-4.1	6.5
	Black	7,819	10.7	5.9	8.8	-2.9	8.5
	Chinese	1,066	17.4	-	-		2.7
	Mixed	5,349	14.0	3.6	8.5	-4.9	7.8
	White	80,649	17.2	4.4	8.3	-3.9	7.7
	Other	2,317	11.7	3.7	7.2	-3.5	6.8
	Unclassified	1,431	13.6	6.2	7.8	-1.6	7.6
First language	English	94,452	16.6	4.3	8.1	-3.8	7.5
	Other	20,025	12.2	3.7	8.0	-4.3	7.5
	Unclassified	420	15.0	0.0	7.0	-7.0	6.0
SEN status	None	110,008	15.9	4.2	8.0	-3.8	7.4
	SEN, no statement	4,274	13.8	4.9	10.9	-6.0	10.0
	SEN with statement	609	15.3	-	-		11.2
School gender	Boys	7,016	13.7	2.7	5.5	-2.8	5.1
	Girls	13,081	20.0	2.1	4.0	-1.9	3.6
	Mixed	190,902	13.1	4.5	10.0	-5.5	9.3
Parental educated at HE?	Yes	97,678	15.9	3.3	7.0	-3.7	6.4
	No	86,286	12.0	5.3	11.3	-6.0	10.6
	Don't know / not available	25,687	10.2	5.3	12.2	-6.9	11.5
Socioeconomic classification (1=high, 8=low, 9=Not classified)	1	50,866	17.1	3.1	6.1	-3.0	5.6
	2	48,614	14.8	3.7	8.5	-4.8	7.8
	3	22,771	13.0	5.2	9.5	-4.3	9.0
	4	15,540	11.1	3.8	10.7	-6.9	10.0
	5	9,499	12.7	4.2	10.8	-6.6	9.9
	6	19,703	10.4	5.6	12.4	-6.8	11.7
	7	12,568	10.4	6.3	12.9	-6.6	12.2
	8	562	7.5	-	-		17.1
	9	27,688	11.3	5.4	10.6	-5.2	10.0

In each category, the percentage of EPQ students dropping out was lower than the percentage of non-EPQ students. There was some tendency for the effect of taking EPQ to be larger for the groups where drop-out was higher (e.g., male students, college students, mixed gender school students, students in socioeconomic classes below 3).

Table 19 to 21 present summary statistics for KS5 point score mean, IDACI score and school KS5 point score mean, by drop-out and whether EPQ was taken or not. EPQ students and those not dropping out had higher mean KS5 points score, lower IDACI score, and attended schools with higher mean KS5 points score on average.

Table 19: Mean KS5 point score, by whether student dropped out in year 1 or year 2 and by EPQ uptake

Taking EPQ?	Drop-out in Y1	Students	Mean of KS5 point score mean	SD of KS5 point score mean
No	No	164,996	232.08	33.83
	Yes	17,401	217.74	36.00
Yes	No	27,386	240.63	34.02
	Yes	1,216	219.17	38.59

Table 20: Mean IDACI score, by whether student dropped out in year 1 or year 2 and by EPQ uptake

Taking EPQ?	Drop-out in Y1	Students	Mean IDACI score	SD IDACI score
No	No	88,681	0.163	0.126
	Yes	7,818	0.200	0.138
Yes	No	17,361	0.140	0.114
	Yes	765	0.174	0.130

Table 21: School mean KS5 point score, by whether student dropped out in year 1 or year 2 and by EPQ uptake

Taking EPQ?	Drop-out in Y1	Students	Mean of school KS5 point score mean	SD of school KS5 point score mean
No	No	164,996	225.23	15.81
	Yes	17,401	219.63	13.49
Yes	No	27,386	228.43	15.36
	Yes	1,216	223.08	13.99

Table 22 presents the drop-out rate, by subject group. In all subject groups apart from medicine / dentistry, EPQ students were less likely to drop out than non-EPQ students. The biggest differences between EPQ and non-EPQ students were for computer sciences (-9 percentage points), biological sciences (-7.1 p.p.), and engineering / technology (-6.5 p.p.). The smallest differences were for medicine / dentistry (0.1 p.p.), languages (-2.3 p.p.), and architecture, building and planning (-2.5 p.p.).

Table 22: EPQ and non-EPQ students dropping out of HE by year 2, by subject group

Subject group	Students	% taking EPQ	% EPQ dropping out	% non-EPQ dropping out	Difference in % dropping out	% all dropping out
Medicine / dentistry	3,890	29.1	1.1	1.0	0.1	1.1
Subjects allied to med	14,698	12.6	3.9	8.2	-4.3	7.6
Biological Sciences	27,331	13.2	3.9	11.0	-7.1	10.1
Veterinary Science	485	25.8	-	-	-	-
Agriculture	1,430	11.5	13.4	17.7	-4.3	17.2
Physical Sciences	10,868	16.9	2.5	6.0	-3.5	5.4
Mathematical Sciences	5,488	11.8	2.9	6.3	-3.4	5.9
Computer Sciences	9,935	9.2	6.5	15.5	-9.0	14.7
Engineering/Technology	12,716	12.4	4.9	11.4	-6.5	10.6
Arch., Building & Planning	3,620	11.9	6.1	8.6	-2.5	8.3
Social Studies	20,926	14.9	4.4	7.8	-3.4	7.3
Law	9,413	17.4	3.2	7.5	-4.3	6.8
Business/Admin. Studies	24,011	8.1	6.7	11.2	-4.5	10.8
Mass Communications	5,469	11.0	6.1	11.5	-5.4	10.9
Languages	10,670	20.3	3.5	5.8	-2.3	5.3
Hist / Phil Studies	9,491	22.5	3.0	5.8	-2.8	5.2
Creative Arts & Design	19,976	8.9	6.8	12.4	-5.6	11.9
Education	6,033	10.1	5.4	9.7	-4.3	9.3
Combined	14,536	16.0	3.9	8.1	-4.2	7.4

Table 23 presents the percentage of students dropping out, by EPQ grade.

Table 23: Drop-out rate (year 1 or year 2) by EPQ grade.

EPQ grade	No of students	% students dropping out (Y2)
A*	5,674	2.0
A	7,287	2.5
B	6,290	4.0
C	4,670	5.4
D	2,515	7.5
E	1,144	9.1
U	447	13.2
X	575	11.8
Not taken	182,403	9.5

As with drop-out in year 1, there was a clear pattern, with higher drop-out rates for students achieving lower grades for their EPQ. However, EPQ grade correlated substantially with the A level mean (Pearson correlation coefficient = 0.457, n=28,652) which may partly explain why drop-out rate was lower amongst students achieving higher grades.

Table 24 presents the results of the regression models. The table only shows the results of four models, because there were no significant interaction effects between EPQ and other variables.

Table 24: Results of regressions modelling the probability of drop-out in year 1 or 2 (model 1= student factors, 2=school factors, 3=excluding census variables, 4=EPQ grade)

Fixed effects		Model 1 (n=113,148)	Model 2 (n=113,140)	Model 3 (n=206,956)	Model 4 (n=113,140)
Intercept		-3.988 (0.235)*	-3.845 (0.235)*	-3.956 (0.171)*	-3.831 (0.235)*
Taken EPQ	No				
	Yes	-0.487 (0.042)*	-0.471 (0.042)*	-0.497 (0.033)*	
EPQ grade	N/A				
	A*				-0.528 (0.126)*
	A				-0.723 (0.099)*
	B				-0.593 (0.085)*
	C				-0.562 (0.087)*
	D				-0.319 (0.099)*
	E				-0.115 (0.135)
	U				0.045 (0.203)
X				0.433 (0.183)*	
Mean KS5 point score		-0.006 (0.000)*	-0.007 (0.000)*	-0.006 (0.000)*	-0.006 (0.000)*
Gender	Female				
	Male	0.366 (0.026)*	0.357 (0.027)*	0.318 (0.018)*	0.354 (0.027)*
IDACI score		1.302 (0.103)*	1.308 (0.103)*		1.304 (0.103)*
Ethnic group	White				
	Asian	-0.427 (0.047)*	-0.416 (0.047)*		-0.418 (0.047)*
	Black	-0.239 (0.051)*	-0.241 (0.051)*		-0.246 (0.051)*
	Chinese	-0.932 (0.201)*	-0.913 (0.201)*		-0.913 (0.201)*
	Mixed	-0.060 (0.057)	-0.058 (0.057)		-0.059 (0.057)
	Other	-0.423 (0.093)*	-0.424 (0.093)*		-0.427 (0.093)*
	Unclassified	-0.050 (0.110)	-0.055 (0.110)		-0.063 (0.110)
First language	English				
	Other	-0.134 (0.041)*	-0.139 (0.041)*		-0.139 (0.041)*
	Unclassified	-0.340 (0.222)	-0.349 (0.222)		-0.349 (0.222)
SEN status	None				

Fixed effects		Model 1 (n=113,148)	Model 2 (n=113,140)	Model 3 (n=206,956)	Model 4 (n=113,140)
	SEN, no statement	0.127 (0.056)*	0.132 (0.056)*		0.132 (0.056)*
	SEN + statement	0.126 (0.137)	0.118 (0.137)		0.117 (0.137)
Degree subject	Medicine / dentistry				
	Subjects allied to medicine	0.865 (0.233)*	0.805 (0.233)*	0.885 (0.167)*	0.798 (0.233)*
	Biological Sciences	1.023 (0.230)*	0.956 (0.231)*	1.070 (0.165)*	0.949 (0.231)*
	Veterinary Science	0.073 (0.754)	0.026 (0.754)	0.477 (0.449)	0.023 (0.754)
	Agriculture	1.828 (0.271)*	1.765 (0.270)*	1.810 (0.186)*	1.763 (0.271)*
	Physical Sciences	0.736 (0.236)*	0.670 (0.236)*	0.826 (0.169)*	0.663 (0.236)*
	Mathematical Sciences	1.180 (0.239)*	1.111 (0.239)*	1.101 (0.174)*	1.101 (0.240)*
	Computer Sciences	1.331 (0.233)*	1.262 (0.233)*	1.239 (0.167)*	1.253 (0.233)*
	Engineering/Technology	1.084 (0.233)*	1.024 (0.234)*	1.232 (0.167)*	1.014 (0.234)*
	Architecture, Building & Planning	0.933 (0.247)*	0.872 (0.247)*	0.794 (0.176)*	0.864 (0.247)*
	Social Studies	0.999 (0.231)*	0.932 (0.231)*	0.959 (0.166)*	0.921 (0.231)*
	Law	0.788 (0.237)*	0.726 (0.237)*	0.800 (0.169)*	0.720 (0.237)*
	Business/Admin. Studies	1.081 (0.231)*	1.017 (0.231)*	1.031 (0.165)*	1.005 (0.231)*
	Mass Communications	1.050 (0.238)*	0.977 (0.238)*	0.947 (0.170)*	0.967 (0.238)*
	Languages	1.007 (0.236)*	0.938 (0.236)*	1.003 (0.169)*	0.930 (0.236)*
	Hist / Phil Studies	0.844 (0.236)*	0.776 (0.236)*	0.864 (0.170)*	0.772 (0.237)*
	Creative Arts & Design	1.122 (0.232)*	1.051 (0.232)*	1.116 (0.166)*	1.041 (0.233)*
	Education	0.884 (0.237)*	0.813 (0.237)*	0.747 (0.171)*	0.805 (0.238)*
	Combined	1.015 (0.233)*	0.945 (0.233)*	1.010 (0.167)*	0.937 (0.233)*
Socioeconomic classification	1				
	2	0.109 (0.038)*	0.106 (0.038)*	0.126 (0.027)*	0.106 (0.038)*
	3	0.102 (0.046)*	0.098 (0.046)*	0.121 (0.032)*	0.099 (0.046)*
	4	0.180 (0.051)*	0.173 (0.051)*	0.148 (0.035)*	0.171 (0.051)*
	5	0.128 (0.059)*	0.121 (0.059)*	0.127 (0.042)*	0.122 (0.059)*
	6	0.244 (0.047)*	0.237 (0.047)*	0.245 (0.032)*	0.235 (0.047)*
	7	0.253 (0.053)*	0.244 (0.053)*	0.237 (0.036)*	0.242 (0.053)*
	8	0.205 (0.193)	0.205 (0.193)	0.361 (0.121)*	0.194 (0.193)

Fixed effects		Model 1 (n=113,148)	Model 2 (n=113,140)	Model 3 (n=206,956)	Model 4 (n=113,140)
	Not classified	0.297 (0.045)*	0.294 (0.045)*	0.270 (0.030)*	0.292 (0.045)*
Parent educated to HE?	Yes				
	No	0.271 (0.029)*	0.267 (0.029)*	0.230 (0.020)*	0.266 (0.029)*
	Don't know / unavailable	0.322 (0.040)*	0.320 (0.040)*	0.315 (0.026)*	0.318 (0.040)*
School type	Acad / Comp				
	College		-0.49 (0.746)	0.412 (0.033)*	-0.475 (0.746)
	Independent		n/a	-0.188 (0.051)*	n/a
	Selective		-0.5 (0.063)	-0.487 (0.062)*	-0.497 (0.063)*
	Other		0.097 (0.067)	0.084 (0.067)	0.093 (0.068)
School gender	Mixed				
	Boys		-0.108 (0.095)	-0.111 (0.080)	-0.107 (0.095)
	Girls		-0.186 (0.073)*	-0.208 (0.062)*	-0.185 (0.074)*
School mean KS5 point score		0.005 (0.001)*	-0.001 (0.001)	0.005 (0.001)*	

There was a significant and negative effect of taking EPQ on the probability of dropping out in year 1 or year 2. In terms of EPQ grade, the largest effect (compared with not taking EPQ at all) was for those achieving a grade A. Somewhat surprisingly, the drop-out probability for those achieving a grade A* was higher than for those achieving grades A, B, or C.

There was almost no difference in the size of the EPQ parameter estimate between model 3 (which excluded census variables) and models 1 and 2.

Figure 8 presents the probabilities, by KS5 points score and whether EPQ was taken. This reveals only small differences between EPQ and non-EPQ students. However, the differences were larger than the equivalent differences when looking at drop out in year 1 (see Figure 5). For EPQ students with a mean KS5 of 230 points, the probability of dropping out was 0.12, compared with 0.20 for non-EPQ students.

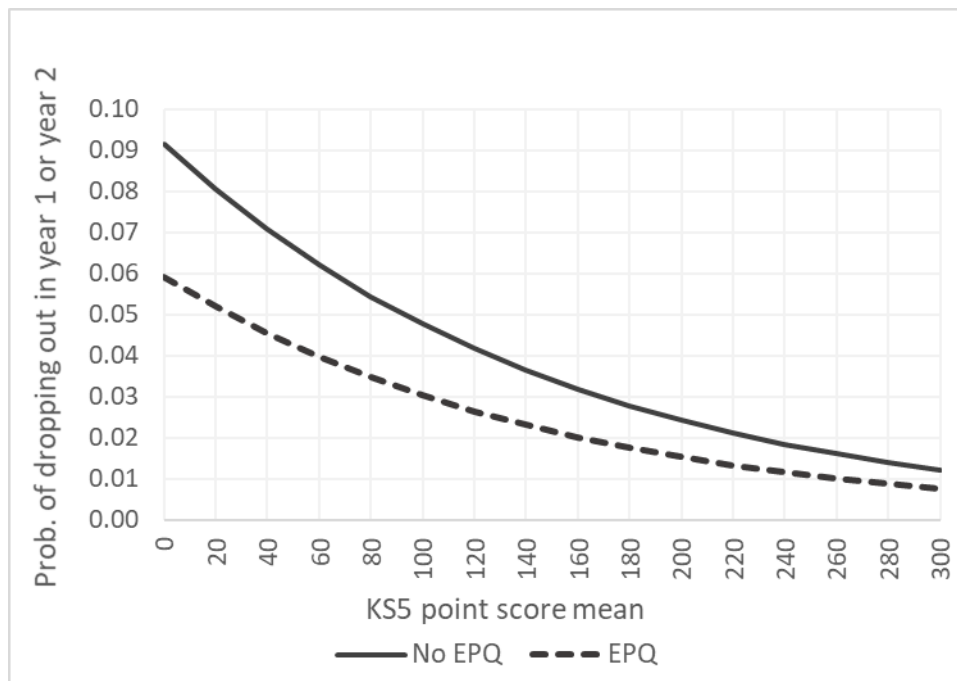


Figure 8: Predicted probabilities of dropping out in year 1 or year 2, by EPQ and KS5 point score

Figure 9 presents the probabilities by EPQ grade. Achieving grades A* to D in EPQ was associated with a significantly lower probability of dropping out, compared with not taking EPQ. However, achieving a grade X was associated with a significantly higher probability of dropping out.

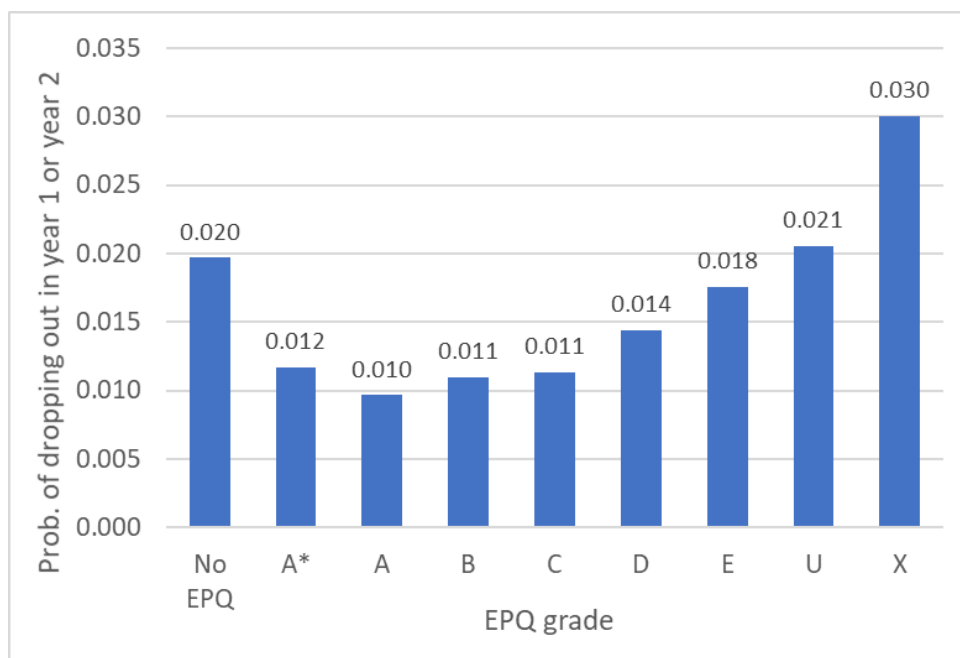


Figure 9: Predicted probabilities of dropping out in year 1 or year 2, by EPQ grade

RQ3: Is taking an EPQ associated with better degree performance?

For the final set of analyses we looked at the probability of achieving a good degree (first or upper second class), by whether EPQ was taken. Table 25 presents the breakdown of degree class for EPQ and non-EPQ students. This shows that EPQ students were more likely to achieve a first or at least an upper second than students without EPQ.

Table 25: Degree class distribution for EPQ and non-EPQ students

Degree class	EPQ students	EPQ %	Non-EPQ students	Non-EPQ %
First	4,843	30.97	22,437	24.55
Upper Second	8,869	56.72	50,343	55.09
Lower Second	1,776	11.36	16,748	18.33
Third	136	0.87	1,740	1.90
Unclassified	13	0.08	108	0.12
All	15,637	100.00	91,376	100.00

EPQ and achieving a first

Table 26 presents the percentage of EPQ and non-EPQ students achieving a first (and the difference between these), by background characteristics.

Table 26: EPQ and non-EPQ students achieving a first, by background characteristics

Category		Candidates	% taking EPQ	% EPQ achieving 1 st	% non-EPQ achieving 1 st	Difference in % achieving 1 st	% all achieving 1 st
Gender	Female	64,842	15.7	31.6	25.5	6.1	26.4
	Male	42,171	13.0	29.8	23.2	6.6	24.1
School type	College	34,943	11.3	30.3	22.3	8.0	23.2
	Comp / Acad.	48,922	15.6	29.9	25.4	4.5	26.1
	Independent	11,557	13.3	33.1	24.9	8.2	26.0
	Selective	8,670	24.6	35.3	30.1	5.2	31.4
	Other	2,784	13.9	26.4	22.5	3.9	23.1
Ethnic group	Asian	7,742	13.6	25.7	22.6	3.1	23.0
	Black	3,150	11.6	13.7	13.8	-0.1	13.8
	Chinese	532	17.9	28.4	24.7	3.7	25.4
	Mixed	2,538	14.7	27.0	23.5	3.5	24.0
	White	43,385	18.2	32.7	27.6	5.1	28.6
	Other	1,042	12.0	24.8	22.2	2.6	22.5
	Unclassified	673	13.5	30.8	22.2	8.6	23.3
First language	English	49,698	17.6	31.9	26.8	5.1	27.7
	Other	9,144	13.3	23.7	20.8	2.9	21.1
	Unclassified	220	17.3	31.6	23.1	8.5	24.6
SEN status	None	56,782	17.0	31.0	25.9	5.1	26.8
	SEN, no statement	2,005	15.3	24.2	23.2	1.0	23.3
	SEN with statement	273	17.6	37.5	24.4	13.1	26.7
School gender	Boys	3,093	14.5	30.6	25.2	5.4	26.0
	Girls	7,008	20.2	33.5	26.6	6.9	28.0
	Mixed	96,912	14.2	30.7	24.4	6.3	25.3
Parental educated at HE?	Yes	49,212	16.8	32.6	26.3	6.3	27.4
	No	43,994	13.5	28.7	23.6	5.1	24.3
	Don't know / not available	12,258	11.3	31.0	21.8	9.2	22.9
Socioeconomic classification (1=high, 8=low, 9=Not classified)	1	26,007	17.6	33.5	27.6	5.9	28.7
	2	25,146	16.1	31.8	25.5	6.3	26.5
	3	11,834	13.9	28.4	23.6	4.8	24.3
	4	7,654	12.7	29.0	22.6	6.4	23.4
	5	4,969	14.1	30.8	25.0	5.8	25.8
	6	9,514	11.9	27.9	22.0	5.9	22.7
	7	6,159	12.0	26.0	20.7	5.3	21.4
	8	271	8.1	-	-	-	15.9
	9	13,952	12.4	29.7	23.0	6.7	23.9

For almost all categories EPQ students were more likely than non-EPQ students to achieve a first. The only exception was black students, with 13.7% of EPQ students and 13.8% of non-EPQ students achieving a first. The biggest differences between EPQ and non-EPQ students were for male students, those attending independent schools, colleges or mixed gender schools, white students, students with a statement of SEN, and students whose parents were educated to HE level.

Table 27 to 29 present summary statistics for KS5 point score mean, IDACI score and school KS5 point score mean, by achieving a first and whether EPQ was taken. These show that students taking an EPQ and those achieving a first had a higher mean KS5 point score and lower IDACI score on average. However, there was little difference in the average of the centre mean KS5 point score for EPQ students and for those achieving a first compared with non-EPQ students and those not achieving a first.

Table 27: Mean KS5 point score, by achievement of a first and by EPQ uptake

Taking EPQ?	Achieved first	Students	Mean of KS5 point score mean	SD of KS5 point score mean
No	No	68,939	229.92	30.44
	Yes	22,437	240.60	30.04
Yes	No	10,794	234.66	31.60
	Yes	4,843	248.07	30.65

Table 28: Mean IDACI score, by achievement of a first and by EPQ uptake

Taking EPQ?	Achieved first	Students	Mean IDACI score	SD IDACI score
No	No	36,332	0.165	0.127
	Yes	12,619	0.143	0.114
Yes	No	6,894	0.146	0.117
	Yes	3,081	0.127	0.105

Table 29: Centre mean KS5 point score, by achievement of a first and by EPQ uptake

Taking EPQ?	Achieved first	Students	Mean of centre KS5 point score mean	SD of centre KS5 point score mean
No	No	68,939	224.58	15.25
	Yes	22,437	226.05	15.60
Yes	No	10,794	227.15	15.01
	Yes	4,843	228.85	15.12

Table 30 presents the percentages achieving a first, by subject group. In all subject areas, EPQ students were more likely to achieve a first than students without EPQ. However, the difference varied between subject areas, with the smallest differences amongst students taking subjects in the law (1.1 percentage points) or medicine / dentistry (1.9 p.p.) areas and the largest differences amongst students taking subjects in the agriculture (18.9 p.p.) or engineering / technology (11.0 p.p.) areas.

Table 30: EPQ and non-EPQ students achieving a first, by subject group

Subject group	Students	% taking EPQ	% EPQ achieving 1 st	% non-EPQ achieving 1 st	Difference in % achieving 1 st	% all achieving 1 st
Medicine / dentistry	299	33.1	36.4	34.5	1.9	35.1
Subjects allied to medicine	5,704	15.5	39.9	32.2	7.7	33.4
Biological Sciences	16,163	14.3	30.2	22.7	7.5	23.8
Veterinary Science	78	32.1	-	-		39.7
Agriculture	603	11.9	38.9	20.0	18.9	22.2
Physical Sciences	4,380	16.9	31.9	24.6	7.3	25.9
Mathematical Sciences	2,559	11.6	41.2	37.6	3.6	38.0
Computer Sciences	3,456	9.4	43.1	33.0	10.1	34.0
Engineering/Technology	2,375	10.8	39.3	28.3	11.0	29.5
Arch., Building & Planning	1,574	15.0	31.4	24.7	6.7	25.7
Social Studies	13,456	16.0	29.2	22.2	7.0	23.3
Law	5,876	19.0	18.9	17.8	1.1	18.0
Business/Admin. Studies	10,565	8.1	32.5	25.5	7.0	26.1
Mass Communications	3,721	12.3	32.0	24.2	7.8	25.1
Languages	5,522	22.3	30.1	21.9	8.2	23.7
Hist / Phil Studies	6,836	23.8	30.1	21.4	8.7	23.5
Creative Arts & Design	12,265	9.5	33.1	26.4	6.7	27.1
Education	4,302	11.1	28.6	22.9	5.7	23.6
Combined	7,279	17.9	30.7	22.5	8.2	24.0

Table 31 presents the percentage of students achieving a first, by EPQ grade

Table 31: Achieving a first, by EPQ grade.

EPQ grade	No of students	% students achieving first
A*	2,928	45.8
A	4,014	33.9
B	3,647	28.4
C	2,634	24.3
D	1,364	21.3
E	558	14.7
U	218	17.4
X	274	19.3
Not taken	91,378	24.6

The higher the EPQ grade, the greater the probability of achieving a first. However, EPQ grade correlated significantly with the A level mean (Pearson correlation coefficient = 0.435, n=15,637, sig. = <0.0001) which may partly explain why the probability of a first was higher amongst students achieving higher grades.

Table 32 presents the results of the regression analyses predicting the probability of achieving a first. As before, 5 separate models were run.

Table 32: Results of regressions modelling the probability of achieving a first (model 1= student factors, 2=school factors, 3=interactions, 4=excluding census variables, 5=EPQ grade)

Fixed effects		Model 1 (n=58,418)	Model 2 (n=58,336)	Model 3 (n=58,336)	Model 4 (n=104,875)	Model 5 (n=58,414)
Intercept		-0.788 (0.194)*	-0.833 (0.195)*	-0.830 (0.196)*	-0.972 (0.142)*	-0.864 (0.197)*
Taken EPQ	No					
	Yes	0.239 (0.027)*	0.226 (0.027)*	0.168 (0.034)*	0.297 (0.022)*	
EPQ grade	N/A					
	A*					0.718 (0.055)*
	A					0.356 (0.046)*
	B					0.115 (0.050)*
	C					0.030 (0.059)
	D					-0.112 (0.088)
	E					-0.438 (0.148)*
	U					-0.502 (0.235)*
X					-0.386 (0.221)	
Mean KS5 point score		0.018 (0.000)*	0.019 (0.000)*	0.019 (0.000)*	0.018 (0.000)*	0.019 (0.000)*
Gender	Female					
	Male	-0.220 (0.022)*	-0.225 (0.023)*	-0.247 (0.025)*	-0.191 (0.017)*	-0.218 (0.023)*
IDACI score		-0.895 (0.099)*	-0.951 (0.099)*	-0.951 (0.099)*		-0.953 (0.100)*
Ethnic group	White					
	Asian	-0.263 (0.040)*	-0.257 (0.040)*	-0.257 (0.040)*		-0.252 (0.040)*
	Black	-0.804 (0.059)*	-0.799 (0.059)*	-0.799 (0.059)*		-0.788 (0.059)*
	Chinese	-0.182 (0.108)	-0.173 (0.108)	-0.172 (0.108)		-0.163 (0.108)
	Mixed	-0.198 (0.051)*	-0.194 (0.051)*	-0.194 (0.051)*		-0.194 (0.051)*
	Other	-0.164 (0.084)	-0.158 (0.084)	-0.158 (0.084)		-0.147 (0.084)
	Unclassified	-0.285 (0.102)*	-0.255 (0.102)*	-0.255 (0.102)*		-0.242 (0.102)*
First language	English					
	Other	-0.189 (0.038)*	-0.188 (0.038)*	-0.188 (0.038)*		-0.188 (0.038)*
	Unclassified	-0.042 (0.174)	-0.028 (0.172)	-0.028 (0.172)		-0.024 (0.172)
SEN status	None					

	SEN, no statement	-0.196 (0.057)*	-0.192 (0.057)*	-0.192 (0.057)*		-0.185 (0.057)*
	SEN + statement	-0.095 (0.146)	-0.079 (0.146)	-0.078 (0.146)		-0.073 (0.146)
Degree subject	Medicine / dentistry					
	Subjects allied to med	0.418 (0.193)*	0.429 (0.193)*	0.436 (0.194)*	0.435 (0.139)*	0.451 (0.196)*
	Biological Sciences	-0.002 (0.191)	0.012 (0.191)	0.019 (0.191)	0.029 (0.137)	0.033 (0.193)
	Veterinary Science	0.184 (0.365)	0.170 (0.366)	0.179 (0.366)	0.347 (0.278)	0.155 (0.368)
	Agriculture	0.397 (0.250)	0.411 (0.250)	0.421 (0.251)	0.210 (0.181)	0.424 (0.252)
	Physical Sciences	0.079 (0.194)	0.093 (0.195)	0.100 (0.195)	0.169 (0.140)	0.126 (0.197)
	Mathematical Sciences	0.432 (0.196)*	0.439 (0.197)*	0.452 (0.197)*	0.564 (0.142)*	0.482 (0.199)*
	Computer Sciences	0.798 (0.197)*	0.814 (0.198)*	0.821 (0.198)*	0.745 (0.142)*	0.844 (0.200)*
	Engineering/Technology	0.555 (0.200)*	0.569 (0.201)*	0.578 (0.201)*	0.488 (0.145)*	0.599 (0.203)*
	Architecture, Building & Planning	0.128 (0.207)	0.140 (0.207)	0.145 (0.207)	0.151 (0.150)	0.170 (0.209)
	Social Studies	-0.030 (0.191)	-0.014 (0.191)	-0.009 (0.192)	0.017 (0.137)	0.015 (0.193)
	Law	-0.409 (0.194)*	-0.404 (0.195)*	-0.400 (0.195)*	-0.358 (0.140)*	-0.386 (0.197)*
	Business/Admin. Studies	0.363 (0.192)	0.378 (0.193)*	0.386 (0.193)*	0.345 (0.138)*	0.410 (0.195)*
	Mass Communications	0.129 (0.197)	0.149 (0.198)	0.153 (0.198)	0.284 (0.142)*	0.181 (0.200)
	Languages	-0.264 (0.194)	-0.253 (0.194)	-0.247 (0.194)	-0.078 (0.139)	-0.235 (0.196)
	Hist / Phil Studies	-0.218 (0.192)	-0.204 (0.193)	-0.200 (0.193)	-0.057 (0.139)	-0.188 (0.195)
	Creative Arts & Design	0.133 (0.193)	0.153 (0.193)	0.159 (0.193)	0.236 (0.138)	0.187 (0.195)
	Education	-0.017 (0.196)	-0.002 (0.196)	0.003 (0.197)	0.087 (0.142)	0.030 (0.199)
Combined	-0.097 (0.192)	-0.084 (0.193)	-0.078 (0.193)	0.011 (0.139)	-0.053 (0.195)	
Socioeconomic classification	1					
	2	-0.026 (0.027)	-0.029 (0.027)	-0.028 (0.027)	-0.069 (0.021)*	-0.030 (0.027)
	3	-0.071 (0.036)*	-0.073 (0.036)*	-0.073 (0.036)*	-0.143 (0.027)*	-0.072 (0.036)*
	4	-0.094 (0.043)*	-0.094 (0.043)*	-0.095 (0.043)*	-0.189 (0.033)*	-0.092 (0.044)*
	5	-0.034 (0.049)	-0.038 (0.049)	-0.037 (0.049)	-0.077 (0.038)*	-0.034 (0.049)
	6	-0.098 (0.042)*	-0.099 (0.042)*	-0.099 (0.042)*	-0.220 (0.031)	-0.096 (0.042)*
	7	-0.109 (0.049)*	-0.111 (0.049)*	-0.110 (0.049)*	-0.295 (0.037)*	-0.106 (0.050)*
	8	-0.325 (0.239)	-0.341 (0.239)	-0.340 (0.239)	-0.517 (0.174)*	-0.348 (0.239)
	Not classified	-0.078 (0.037)*	-0.079 (0.037)*	-0.080 (0.037)*	-0.169 (0.026)*	-0.078 (0.037)*
	Yes					

Parent educated to HE?	No	-0.092 (0.023)*	-0.095 (0.023)*	-0.095 (0.023)*	-0.044 (0.018)*	-0.094 (0.023)*
	Don't know / unavailable	-0.117 (0.036)*	-0.116 (0.036)*	-0.116 (0.036)*	-0.144 (0.026)*	-0.111 (0.036)*
School type	Acad / Comp					
	College		-0.176 (0.662)	-0.180 (0.662)	-0.396 (0.030)*	-0.221 (0.664)
	Independent		n/a	n/a	-0.008 (0.039)	n/a
	Selective		0.321 (0.040)*	0.321 (0.040)*	0.243 (0.043)*	0.317 (0.041)*
	Other		-0.232 (0.060)*	-0.231 (0.060)*	-0.203 (0.063)*	-0.229 (0.060)*
School gender	Mixed					
	Boys		-0.032 (0.072)	-0.034 (0.072)	-0.043 (0.063)	-0.026 (0.072)
	Girls		-0.041 (0.048)	-0.040 (0.048)	-0.075 (0.042)	-0.041 (0.048)
School mean KS5 point score			-0.009 (0.001)*	-0.009 (0.001)*	-0.003 (0.001)*	-0.009 (0.001)*
Taken EPQ*Mean KS5 point score	No					
	Yes			0.002 (0.001)*		
Taken EPQ*gender	No – Female					
	Yes – Male			0.124 (0.054)*		

There was a significant positive effect of taking EPQ on the probability of achieving a first. The grade achieved in EPQ was also a significant factor, with grades A*, A and B associated with an increased probability and grades E and U associated with a reduced probability of a first compared with not taking EPQ.

The size of the EPQ parameter estimate was somewhat larger for model 4 (which excluded census variables) than for model 2 (the equivalent model, excluding the significant interactions shown in model 3).

It is worth noting that the size of the EPQ parameter estimate for in model 4 (which excluded census variables) was very similar to model 2, (i.e., the equivalent model, excluding the significant interaction shown in model 3). This shows that the exclusion of students with no record for census variables (model 4) had little effect on the outcomes.

Figure 10 presents the predicted probabilities of achieving a first for EPQ and non-EPQ students, by KS5 points score. This was for a typical student, using the results of model 3 in Table 32. EPQ students with a mean KS5 points score of 230 had a predicted probability of achieving a first of 0.39, compared to 0.34 for non-EPQ students.

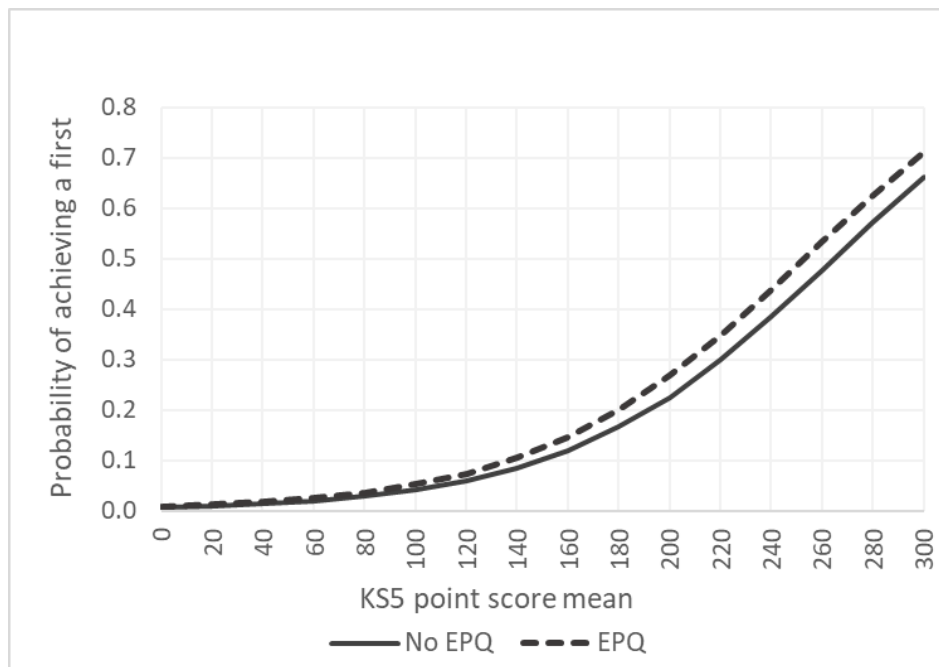


Figure 10: Predicted probabilities of achieving a first, by EPQ and KS5 points score

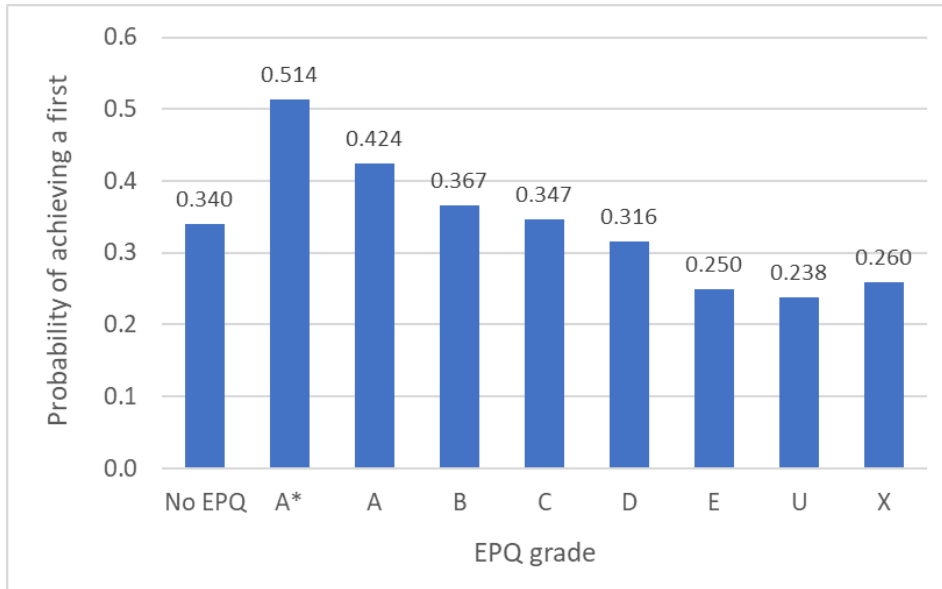


Figure 11: Predicted probabilities of achieving a first, by EPQ grade

In model 3, there were two significant interaction effects. The first of these was between taking an EPQ and the mean KS5 points score. This was a positive (although very small) effect, meaning that the effect of taking EPQ was greater for students with higher mean KS5 points score. This is illustrated by the predicted probabilities presented in Figure 12. This shows a larger gap between the lines at higher mean KS5 points scores. At very low mean KS5 points scores the effect is reversed so that taking an EPQ was associated with lower probability of achieving a first. However, there will be very few students with such low points scores achieving a first. It should also be noted that, the interaction effect although being statistically significant, made very little difference to the probabilities of achieving a first.

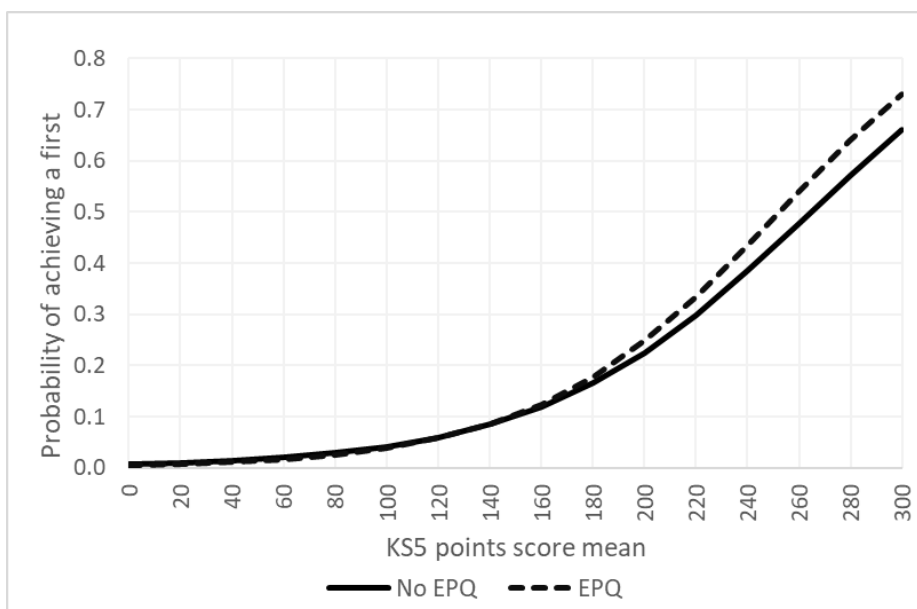


Figure 12: Predicted probabilities of achieving a first, by EPQ and KS5 points score (including interaction between EPQ and KS5 points score)

The second significant interaction was between taking an EPQ and gender. This was a positive effect for male students meaning that for them the effect of taking EPQ was larger than for females. Figure 13 shows the probabilities for typical students, by gender and whether EPQ was taken. Females had a probability of 0.43 for non-EPQ and 0.47 for EPQ students, compared with 0.37 and 0.44 for males.

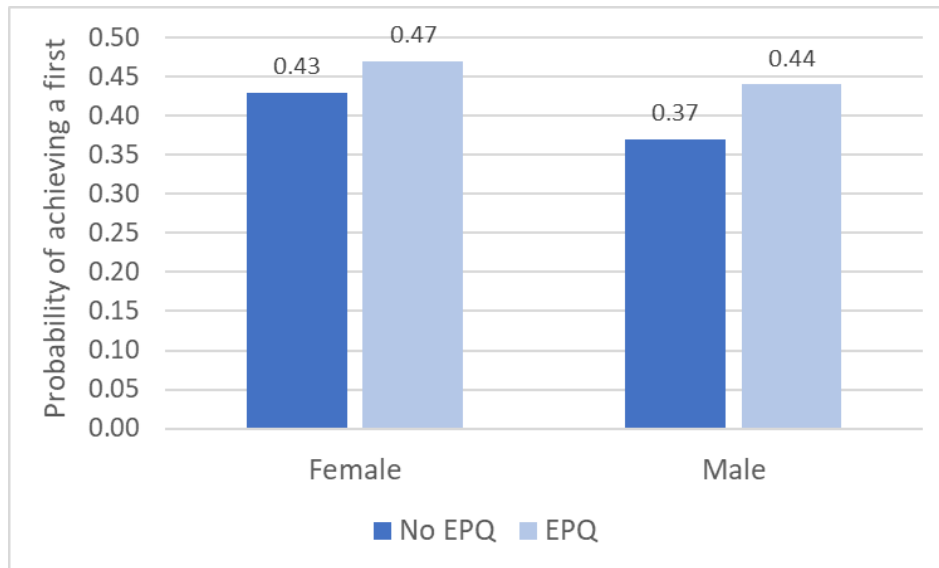


Figure 13: Predicted probabilities of achieving a first, by EPQ and gender

EPQ and achieving at least an upper second

Table 33 presents the percentage of EPQ and non-EPQ students achieving at least an upper second (and the difference between these), by background characteristics. In every category, EPQ students were more likely than non-EPQ students to achieve at least an upper second. The differences were larger for male students, those attending a college or mixed gender school, Chinese students, those whose first language was not English, students with a statement of SEN, and students whose parents were not educated at HE.

Table 33: EPQ and non-EPQ students achieving at least an upper second, by background characteristics

Category		Candidates	% taking EPQ	% EPQ achieving 1 st / 2(i)	% non-EPQ achieving 1 st / 2(i)	Difference in % achieving 1 st / 2(i)	% all achieving first / 2(i)
Gender	Female	64,842	15.7	89.4	82.2	7.2	83.3
	Male	42,171	13.0	84.6	75.9	8.7	77.0
School type	College	34,943	11.3	87.6	74.3	13.3	75.7
	Comp / Acad.	48,922	15.6	86.5	81.1	5.4	81.9
	Independent	11,557	13.3	91.7	85.4	6.3	86.3
	Selective	8,670	24.6	91.9	87.8	4.1	88.8
	Other	2,784	13.9	83.0	78.2	4.8	78.8
Ethnic group	Asian	7,742	13.6	83.1	76.0	7.1	77.0
	Black	3,150	11.6	73.2	69.3	3.9	69.7
	Chinese	532	17.9	85.3	77.1	8.2	78.6
	Mixed	2,538	14.7	87.4	80.3	7.1	81.3
	White	43,385	18.2	88.7	84.3	4.4	85.1
	Other	1,042	12.0	80.0	76.8	3.2	77.2
	Unclassified	673	13.5	89.0	78.2	10.8	79.6
First language	English	49698	17.6	88.2	83.3	4.9	84.2
	Other	9144	13.3	81.7	74.1	7.6	75.1
	Unclassified	220	17.3	86.8	78.6	8.2	80.0
SEN status	None	56782	17.0	87.6	82.0	5.6	83.0
	SEN, no statement	2005	15.3	80.7	76.5	4.2	77.2
	SEN with statement	273	17.6	85.4	76.9	8.5	78.4
School gender	Boys	3,093	14.5	88.2	83.8	4.4	84.5
	Girls	7,008	20.2	92.2	86.7	5.5	87.8
	Mixed	96,912	14.2	87.2	79.0	8.2	80.2
Parental educated at HE?	Yes	49,212	16.8	89.1	82.3	6.8	83.5
	No	43,994	13.5	86.6	78.3	8.3	79.4
	Don't know / not available	12,258	11.3	84.1	76.0	8.1	76.9
Socioeconomic classification (1=high, 8=low, 9=Not classified)	1	26,007	17.6	90.0	84.3	5.7	85.3
	2	25,146	16.1	88.6	81.5	7.1	82.7
	3	11,834	13.9	87.1	79.3	7.8	80.4
	4	7,654	12.7	86.2	76.5	9.7	77.7
	5	4,969	14.1	86.7	79.5	7.2	80.5
	6	9,514	11.9	84.8	75.4	9.4	76.5
	7	6,159	12.0	81.9	73.7	8.2	74.7
	8	271	8.1	68.2	60.6	7.6	61.3
	9	13,952	12.4	86.4	77.8	8.6	78.8

Table 34 to 36 present summary statistics for KS5 point score mean, IDACI score and school KS5 point score mean, by achieving at least an upper second and whether EPQ was taken. These show that EPQ students and those achieving at least an upper second had a lower IDACI score on average. They also attended schools with a slightly higher mean KS5

point score, on average. In terms of mean KS5 point score, EPQ students who did not achieve an upper second had a lower mean KS5 points score than non-EPQ students who failed to achieve an upper second. Conversely, EPQ students who did achieve an upper second had a higher mean KS5 points score than non-EPQ students who achieved an upper second.

Table 34: Mean KS5 point score, by achievement of a first and by EPQ uptake

Taking EPQ?	Achieved at least upper second	Students	Mean of KS5 point score mean	SD of KS5 point score mean
No	No	18,596	222.64	31.41
	Yes	72,780	235.07	30.00
Yes	No	1,925	220.81	32.39
	Yes	13,712	241.34	31.03

Table 35: Mean IDACI score, by achievement of a first and by EPQ uptake

Taking EPQ?	Achieved at least upper second	Students	Mean IDACI score	SD IDACI score
No	No	8,899	0.190	0.135
	Yes	40,052	0.153	0.120
Yes	No	1,259	0.168	0.131
	Yes	8,716	0.136	0.110

Table 36: Centre mean KS5 point score, by achievement of a first and by EPQ uptake

Taking EPQ?	Achieved at least upper second	Students	Mean of centre KS5 point score mean	SD of centre KS5 point score mean
No	No	18,596	221.74	14.12
	Yes	72,780	225.76	15.54
Yes	No	1,925	224.42	14.55
	Yes	13,712	228.13	15.08

Table 37 presents the percentages achieving a first, by subject group. In all subject groups, EPQ students were more likely to achieve at least an upper second than non-EPQ students. The largest differences were for agriculture (16 percentage points) biological sciences (9.3 p.p.), and subjects allied to medicine (9.3 p.p.) and the smallest for medicine / dentistry (1.4 p.p.), and veterinary science (3.5 p.p.).

Table 37: EPQ and non-EPQ students achieving at least an upper second, by subject group

Subject group	Students	% taking EPQ	% EPQ achieving 1 st / 2(i)	% non-EPQ achieving 1 st / 2(i)	Difference in % achieving 1 st / 2(i)	% all achieving 1 st / 2(i)
Medicine / dentistry	299	33.1	91.9	90.5	1.4	91.0
Subjects allied to med	5704	15.5	89.2	79.9	9.3	81.4
Biological Sciences	16163	14.3	87.7	78.4	9.3	79.7
Veterinary Science	78	32.1	96.0	92.5	3.5	93.6
Agriculture	603	11.9	84.7	68.7	16.0	70.7
Physical Sciences	4380	16.9	83.4	76.6	6.8	77.7
Mathematical Sciences	2559	11.6	79.1	75.1	4.0	75.5
Computer Sciences	3456	9.4	82.2	75.3	6.9	75.9
Engineering/Technology	2375	10.8	79.4	71.7	7.7	72.5
Arch., Building & Planning	1574	15.0	83.5	77.1	6.4	78.0
Social Studies	13456	16.0	88.6	82.2	6.4	83.2
Law	5876	19.0	85.9	78.0	7.9	79.5
Business/Admin. Studies	10565	8.1	83.7	77.0	6.7	77.5
Mass Communications	3721	12.3	87.6	82.4	5.2	83.1
Languages	5522	22.3	92.2	87.2	5.0	88.3
Hist / Phil Studies	6836	23.8	93.8	88.8	5.0	90.0
Creative Arts & Design	12265	9.5	85.5	79.3	6.2	79.9
Education	4302	11.1	84.8	76.1	8.7	77.1
Combined	7279	17.9	88.3	81.1	7.2	82.4

Table 38 presents the percentage of students achieving a first or upper second, by EPQ grade.

Table 38: Achieving at least an upper second, by EPQ grade.

EPQ grade	No. of students	No. students achieving 2(i)	% students achieving 2(i)
A*	2,928	2,811	96.0
A	4,014	3,680	91.7
B	3,647	3,213	88.1
C	2,634	2,155	81.8
D	1,364	1,080	79.2
E	558	401	71.9
U	218	170	78.0
X	274	202	73.7
Not taken	91,378	72,780	79.7

There was a consistent pattern with higher grades indicating a higher percentage of students achieving an upper second or a first. The only exception was that grade U students (78.0%) were more likely than grade E students (71.9%).

Table 39 shows the results of the regression analyses, with the same 5 models as before.

Table 39: Results of regressions modelling the probability of achieving at least an upper second (model 1= student factors, 2=school factors, 3=interactions, 4=excluding census variables, 5=EPQ grade)

Fixed effects		Model 1 (n=58,414)	Model 2 (n=58,414)	Model 3 (n=58,414)	Model 4 (n=104,875)	Model 5 (n=58,414)
Intercept		1.808 (0.294)*	1.724 (0.294)*	1.699 (0.295)*	1.490 (0.221)*	1.640 (0.294)*
Taken EPQ	No					
	Yes	0.284 (0.035)*	0.270 (0.036)*	0.306 (0.037)*	0.383 (0.029)*	
EPQ grade	N/A					
	A*					1.183 (0.132)*
	A					0.572 (0.076)*
	B					0.346 (0.066)*
	C					0.013 (0.066)
	D					-0.011 (0.089)
	E					-0.478 (0.124)*
	X					-0.086 (0.215)
Mean KS5 point score		0.012 (0.000)*	0.013 (0.000)*	0.012 (0.000)*	0.013 (0.000)*	0.012 (0.000)*
Gender	Female					
	Male	-0.473 (0.025)*	-0.475 (0.026)*	-0.474 (0.026)*	-0.410 (0.019)*	-0.468 (0.026)*
IDACI score		-1.222 (0.104)*	-1.237 (0.105)*	-1.233 (0.105)*		-1.235 (0.105)*
Ethnic group	White					
	Asian	-0.308 (0.042)*	-0.313 (0.042)*	-0.313 (0.042)*		-0.311 (0.043)*
	Black	-0.665 (0.049)*	-0.662 (0.049)*	-0.662 (0.049)*		-0.647 (0.049)*
	Chinese	-0.350 (0.117)*	-0.361 (0.117)*	-0.361 (0.117)*		-0.351 (0.117)*
	Mixed	-0.217 (0.056)*	-0.218 (0.056)*	-0.218 (0.056)*		-0.216 (0.056)*
	Other	-0.177 (0.085)*	-0.174 (0.085)*	-0.174 (0.085)*		-0.166 (0.085)*
	Unclassified	-0.318 (0.107)*	-0.302 (0.107)*	-0.301 (0.107)*		-0.289 (0.107)*
First language	English					
	Other	-0.190 (0.039)*	-0.184 (0.038)*	-0.183 (0.038)*		-0.182 (0.038)*
	Unclassified	-0.027 (0.186)	-0.003 (0.186)	-0.007 (0.185)		-0.006 (0.186)

SEN status	None					
	SEN, no statement	-0.301 (0.059)*	-0.301 (0.059)*	-0.299 (0.059)*		-0.294 (0.059)*
	SEN + statement	-0.141 (0.158)	-0.130 (0.158)	-0.132 (0.158)		-0.128 (0.158)
Degree subject	Medicine / dentistry					
	Subjects allied to med	0.215 (0.296)	0.240 (0.296)	0.258 (0.297)	0.251 (0.221)	0.301 (0.298)
	Biological Sciences	0.252 (0.293)	0.283 (0.294)	0.301 (0.294)	0.330 (0.220)	0.347 (0.295)
	Veterinary Science	0.566 (0.673)	0.562 (0.673)	0.562 (0.674)	0.883 (0.519)	0.567 (0.675)
	Agriculture	0.455 (0.357)	0.480 (0.357)	0.498 (0.357)	0.075 (0.245)	0.528 (0.358)
	Physical Sciences	-0.133 (0.296)	-0.102 (0.296)	-0.084 (0.297)	0.074 (0.222)	-0.028 (0.298)
	Mathematical Sciences	-0.461 (0.298)	-0.433 (0.298)	-0.410 (0.299)	-0.271 (0.224)	-0.355 (0.300)
	Computer Sciences	0.481 (0.300)	0.515 (0.300)	0.533 (0.300)	0.528 (0.223)*	0.587 (0.302)
	Engineering/Technology	0.023 (0.300)	0.051 (0.301)	0.068 (0.301)	0.095 (0.224)	0.122 (0.302)
	Architecture, Building & Planning	0.116 (0.306)	0.141 (0.306)	0.158 (0.307)	0.280 (0.228)	0.214 (0.308)
	Social Studies	0.320 (0.294)	0.351 (0.294)	0.370 (0.295)	0.464 (0.220)*	0.423 (0.296)
	Law	0.088 (0.295)	0.112 (0.296)	0.128 (0.296)	0.233 (0.221)	0.176 (0.297)
	Business/Admin. Studies	0.364 (0.294)	0.397 (0.295)	0.415 (0.295)	0.484 (0.220)*	0.472 (0.296)
	Mass Communications	0.676 (0.300)*	0.715 (0.300)*	0.730 (0.301)*	0.881 (0.224)*	0.791 (0.302)*
	Languages	0.425 (0.297)	0.457 (0.298)	0.473 (0.298)	0.683 (0.223)*	0.523 (0.299)
	Hist / Phil Studies	0.735 (0.297)*	0.766 (0.297)*	0.782 (0.298)*	0.922 (0.222)*	0.829 (0.299)*
	Creative Arts & Design	0.393 (0.295)	0.432 (0.295)	0.450 (0.296)	0.532 (0.220)*	0.510 (0.297)
	Education	0.119 (0.297)	0.154 (0.297)	0.171 (0.298)	0.317 (0.222)	0.228 (0.299)
Combined	0.243 (0.295)	0.276 (0.295)	0.293 (0.296)	0.424 (0.221)	0.347 (0.297)	
Socioeconomic classification	1					
	2	-0.057 (0.035)	-0.055 (0.035)	-0.053 (0.035)	-0.091 (0.025)*	-0.055 (0.035)
	3	-0.079 (0.043)	-0.075 (0.043)	-0.074 (0.043)	-0.157 (0.031)*	-0.074 (0.043)
	4	-0.181 (0.049)*	-0.176 (0.049)*	-0.177 (0.049)*	-0.265 (0.035)*	-0.172 (0.049)*
	5	-0.027 (0.059)	-0.023 (0.059)	-0.023 (0.059)	-0.087 (0.043)*	-0.018 (0.059)
	6	-0.112 (0.047)*	-0.106 (0.047)*	-0.105 (0.047)*	-0.296 (0.033)*	-0.103 (0.047)*
	7	-0.201 (0.054)*	-0.197 (0.054)*	-0.196 (0.054)*	-0.369 (0.038)*	-0.191 (0.054)*
	8	-0.536 (0.189)*	-0.537 (0.189)*	-0.536 (0.189)*	-0.745 (0.135)*	-0.542 (0.189)*
	Not classified	-0.189 (0.043)*	-0.187 (0.043)*	-0.187 (0.043)*	-0.272 (0.030)*	-0.185 (0.043)*

Parent educated to HE?	Yes					
	No	-0.041 (0.027)	-0.038 (0.027)	-0.037 (0.027)	-0.004 (0.020)	-0.036 (0.027)
	Don't know / unavailable	-0.174 (0.039)*	-0.171 (0.039)*	-0.170 (0.039)*	-0.197 (0.028)*	-0.162 (0.039)*
School type	Acad / Comp					
	College		-0.518 (0.537)	-0.515 (0.536)	-0.458 (0.033)*	-0.585 (0.537)
	Independent		n/a	n/a	0.102 (0.047)*	n/a
	Selective		0.431 (0.052)*	0.428 (0.052)*	0.366 (0.055)*	0.423 (0.052)*
	Other		-0.136 (0.064)*	-0.135 (0.064)*	-0.112 (0.068)	-0.129 (0.064)*
School gender	Mixed					
	Boys		0.025 (0.085)	0.023 (0.085)	-0.038 (0.075)	0.025 (0.085)
	Girls		0.021 (0.059)	0.020 (0.059)	0.005 (0.054)	0.015 (0.059)
School mean KS5 point score			-0.006 (0.001)*	-0.006 (0.001)*	0.000 (0.001)	-0.006 (0.001)*
Taken EPQ*Mean KS5 point score	No					
	Yes			0.004 (0.001)*		

The results in Table 39 show that there was a small, but significant and positive effect of taking EPQ on the probability of achieving at least an upper second. This is illustrated by the predicted probabilities displayed in Figure 14 (for typical students, using the results of model 3 in Table 39). For students with a KS5 mean points score of 230, the probability was 0.89 for EPQ students and 0.86 for non-EPQ students.

As with the model predicting the probability of a first, the size of the EPQ parameter estimate was somewhat larger for model 4 (which excluded census variables) than for model 2 (the equivalent model, excluding the significant interactions shown in model 3).

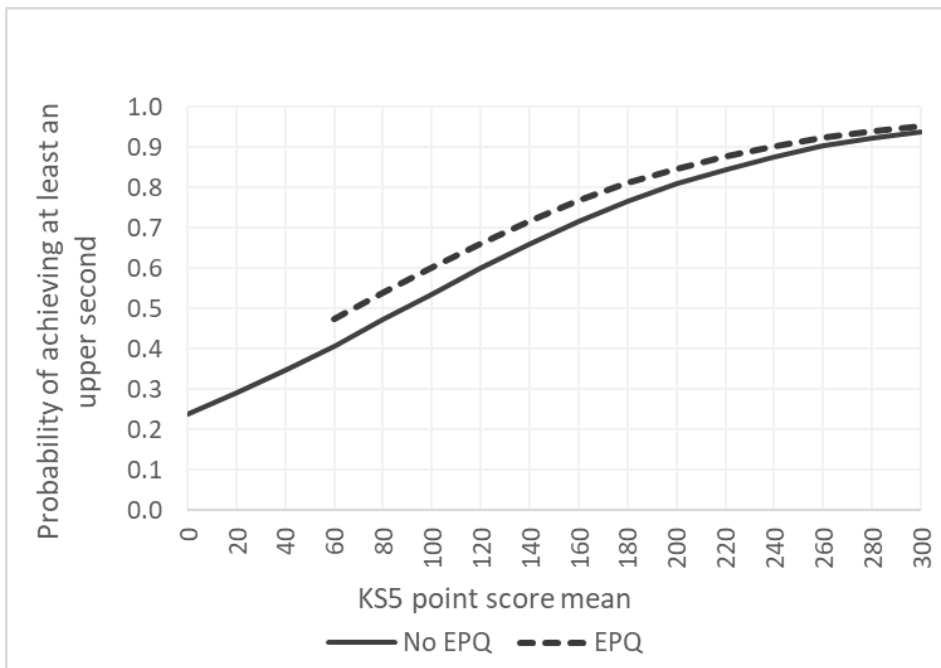


Figure 14: Predicted probabilities of achieving at least an upper second, by EPQ and KS5 points score

The effect of each EPQ grade is illustrated in Figure 15. Grades A*, A and B were associated with a significantly higher probability of achieving at least an upper second and grade E associated with a significantly lower probability compared with not taking EPQ.

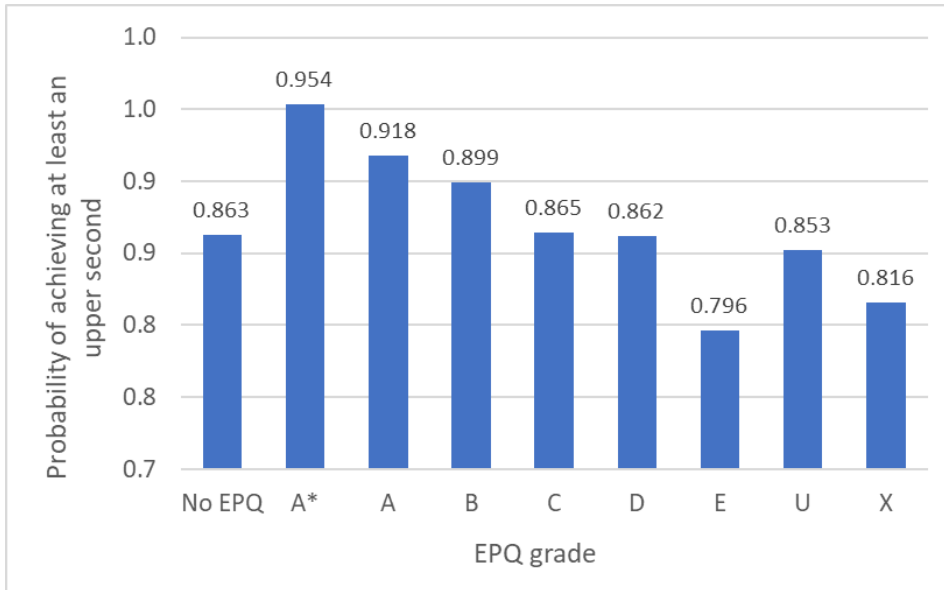


Figure 15: Predicted probabilities of achieving at least an upper second, by EPQ grade

There was one significant interaction between EPQ and KS5 mean points score, which was positive, meaning that the effect of taking EPQ was larger for those with better KS5 results. The effect is shown in Figure 16.

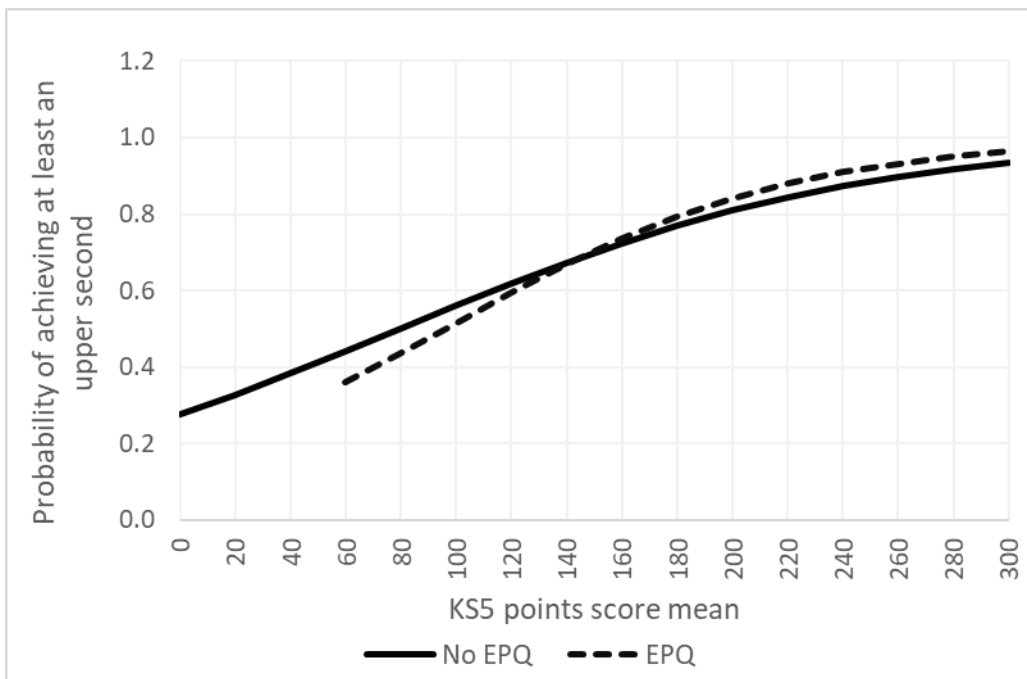


Figure 16: Predicted probabilities of achieving at least an upper second, by EPQ and KS5 points score (including interaction between EPQ and KS5 points score)

In this figure, the effect of EPQ was negative for students with very low KS5 points score, and positive for point scores above 160. However, the differences in probabilities were very small.

Conclusions

Students taking EPQ were more likely to progress to HE (88.5% within the next 3 years) than those not taking the qualification (66.8%). This pattern persisted across different groups of students defined by their background characteristics.

The results of the regression analyses found that EPQ students were more likely to progress, even after accounting for other factors that might affect the likelihood of progressing (e.g., attainment at KS5, gender, ethnic group etc.). The size of the EPQ effect was substantial. For example, a typical student with a mean KS5 points score equal to the mean had a probability of progressing of 0.87 if they took EPQ and 0.72 if they didn't. There was also evidence that achieving a higher EPQ grade was associated with greater likelihood of progressing, after accounting for other factors including KS5 attainment.

There were also two significant interaction effects. The first of these showed that the positive association between taking EPQ and progressing to HE was larger for white students than for students from any other ethnic background. Secondly, the positive effect of taking EPQ was larger for students attending college or comprehensive schools than for those attending selective or independent schools. Both these interactions suggest that the EPQ had more of an impact on students who were less likely to progress. This may be because teachers were aware that EPQ could be useful in preparing students for HE and therefore encouraged some of the less able students who wanted to progress to take the qualification.

The results of the analysis of drop out from HE found that students taking an EPQ were less likely to drop-out (2.3% in year 1, 4.3% by the end of year 2) than non-EPQ students (5.0% in year 1, 9.5% by the end of year 2). These findings were confirmed by the regression analyses, which accounted for other factors including attainment at KS5. The differences in predicted drop-out rates between EPQ and non-EPQ "typical" students were small (0.008 for EPQ students and 0.013 for non-EPQ students for drop-out in year 1; 0.012 for EPQ students and 0.020 for non-EPQ students for drop-out by the end of year 2). However, if we think about this in relative terms then taking EPQ reduced the probability of drop-out by more than 50% compared to not taking EPQ.

There was also some evidence that achieving a higher grade in EPQ was associated with lower probability of dropping out. For example, the probability of dropping out was 0.10 for students achieving a grade A and 0.18 for those achieving a grade E.

For the final research question, we found that EPQ students were more likely to achieve a good degree (31% achieved a first and 87.7% at least an upper second) than non-EPQ students (24.6% and 79.6% respectively). The results of the regressions also revealed an association between taking EPQ and increased likelihood of achieving a good degree, after accounting for other factors including KS5 attainment. These effects were small, but statistically significant. This outcome supports previous research (Gill, 2017b), which showed that students taking EPQ alongside A levels had a higher probability of achieving a first or at least an upper second than students taking A levels only.

There was also evidence that students achieving a higher grade in their EPQ were more likely to get a good degree. For example, a typical student achieving a grade A* (and with a mean KS5 score of 230) had a predicted probability of a first of 0.51, compared with just 0.25 for a student achieving a grade E.

For both analyses predicting the probability of a good degree, the size of the EPQ effect was larger in model 4 (0.297 for the probability of a first, 0.383 for the probability of at least an upper second) than in model 2 (0.226 and 0.270 respectively). Model 4 excluded census variables, which meant a much larger number of students in the model (mostly independent school and sixth form college students) compared to model 2. However, the difference this makes in terms of relative probabilities was not large. For example, the probability of a typical student achieving a first according to model 2 was 0.39 for EPQ students and 0.34 for non-EPQ students, compared with 0.37 and 0.31 respectively according to model 4.

Overall, the results in relation to the probability of drop-out and the probability of achieving a good degree suggest that EPQ students were slightly better prepared for HE than non-EPQ students. They were less likely to drop-out and more likely to achieve a first or at least an upper second-class degree. This finding supports the results of the qualitative analysis undertaken by Stephenson & Isaacs (2019), which suggested that taking EPQ boosted students' attitudes towards learning and their self-perception, attributes which should help with coping with HE studies.

However, as with all studies of this type, the results come with a substantial caveat. We cannot be sure of a causal relationship between taking EPQ and increased likelihood of progression to HE or better outcomes. In terms of progression, it may be that many students chose to do the EPQ because they had already decided to attend HE and they believed it would mean that they were better prepared. For these students, taking EPQ did not increase their chances of progressing. In terms of drop-out rates and degree class, it may be that academically motivated students were more likely to take an EPQ and it is this motivation which led to better outcomes at HE, rather than taking the EPQ *per se*.

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Appendix

Example R code for cross-classified multilevel logistic regression model (probability of achieving a first)

```
Model_first = glmer (first ~ epq + mean_al + ks5_gender + idaci + EthnicGroupMajor +  
  LanguageGroupMajor + SENprovisionMajor + main_subject_group +  
  he_sec + he_pared + schooltype + school_gender + centre_mean_al +  
  (1 | laestab) + (1 | HE_XINSTID01_19), data = dat3, family = binomial,  
  nAGQ = 0)
```