UNIVERSITY OF BIRMINGHAM

Labour market expectations, relative performance and subject choice

Project Report

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1 Project Summary

This project evaluated effects of an intervention which provided students with information about the differences between earnings of graduates from different subjects. The research focused on 15/16 year old students choosing subjects to study in the sixth form (Year 12). The study collected data from students before and after they had taken GCSE examinations at age 16. Therefore, the sample was restricted to schools serving the 13-18 or 11-18 age range. We also restricted the sample to schools with large sixth forms and over-sampled private schools in order to capture a good range of types of private school. For these reasons our sample of students comprises largely 'above average' achievers who achieved grades at age 16 which made going to university a realistic option. Schools serving a large part of the country were approached on a random basis. The effect of the intervention was evaluated using a 'a single blind cluster randomised controlled trial'. That is, schools did not know whether they had been assigned to receive the intervention or an alternative lesson reflecting typical practice. We controlled for pupil and school characteristics using data gathered through questionnaires before and after the intervention and matched data from the National Pupil Database. These sources enabled us to examine differences between intentions to study subjects before and after the intervention and differences between intentions to study subjects and subjects subsequently studies. Qualitative interviews were used to check how the intervention was implemented and how students interpreted the questions. The trial was registered with the social science registry (AEARCTR-0000468) and the trial protocol is available on the project web site.

This report presents the key findings (Section 2); outlines the policy and research background (Section 3); presents the project research questions and objectives (Section 4); summarises the key activities of the project (Section 5); and provides some details on the sampling and data collection (Section 6).

2 Key Findings

2.1 Students' intentions towards participation in Higher Education are positively associated with expectations of graduate salaries *and* with cultural capital. Moreover, students with higher cultural capital had higher expectations of graduate salaries.

2.2 Pupils attending state schools were less optimistic in their grade expectations than pupils attending private schools (where optimism is defined as expected grade minus a grade predicted on the basis of prior achievement, gender and eligibility for free school meals). The association between optimism in grade expectations for maths and optimism in grade expectations for English was modest.

2.3 On average, there was a positive relationship between pupils' optimism in grade expectations and subsequent grades achieved (aligning with the literatures on academic self-concept and self-efficacy). Pupils overestimated their actual grade in maths by an average of one quarter of a grade and overestimated their performance in English by an average of one third of a grade The school component of the positive association (roughly 15%) between pupil grades and optimism in pupil grade predictions is sufficient to be an appreciable concern for schooling policy and would benefit from further research which takes a more in-depth and/or experimental approach. If this result is supported by further research it suggests that strategies which succeed in *getting students to believe* they can achieve a grade or more than predicted on past results would raise average achievement. This is, of course, different from *schools setting targets* which they expect students to work towards.

2.4 Students were asked to state the salaries they expected graduates of different subjects to earn at age 30. They substantially over-estimated earnings for pure subjects relative to applied subjects. For example, they believed that graduates in politics or sociology earned roughly 25% more than graduates in Education, whereas average graduate salaries at age 30 have been higher for Education graduates than for graduates in Politics or Sociology. Likewise they believed that graduates in pure science earned more than graduates in engineering whereas the situation is reverse. Policies that promote STEM subjects without distinguishing between Mathematics, Computing and Engineering and pure science are unlikely to alleviate these problems.

2.5 Students substantially over-estimated variation around the mean for the earnings of graduates in each subject. They also believed, incorrectly, that this degree of variation was similar for each subject. They believed variation in what *they* would earn if they studied one subject rather than another was more strongly associated with their own aptitudes and interests than with differences between average salaries for graduates in different subjects.

2. 6 We found strong associations between students' beliefs about their own likely earnings if they graduated in a subject and their choices of subjects to study in the final years of schooling. The probability of intending to study a subject was more strongly associated with expected earnings than with any other variable. The size of these differences remained strong when using students' expectations of average graduate salaries rather than their expectations for themselves. This provides some grounds for believing that students' beliefs about graduate salaries are related to their choices from advanced level (A-level) onwards.

2.7 We found evidence of substantial changes between students' intentions and actual choices of A-level subjects. We analysed these changes in terms of subjects that the Russell Group of universities has termed 'facilitating' and subjects they originally described as 'soft' and more recently as 'not-facilitating'. Students who achieved higher GCSE grades than expected increased the proportion of facilitating A-level subjects they studied. Students who achieved lower grades than expected switched away from facilitating subjects. These associations were much stronger for Mathematics than English. This indicates that either students or schools (or both) are willing to put aside their previous predictions of achievement in response to examination grades which are known to include measurement error.

2.8 Providing Year 11 students with information about variation in graduate earnings by subject affected their actual choice of A-level subjects. The estimated effects are shown by the Odds Ratio column in Table 1. The Odds Ratio for Biology (0.73) means that students in the intervention group were 30% less likely than students in the control group to study Biology. The Odds Ratio for Mathematics (1.39) means that students in the intervention group were nearly 40% more likely than students in the control group to study Mathematics. The p (probability) values in the final column for Biology, Computing and Mathematics are each less than 0.05 suggesting that it is very unlikely that these effects occurred as random, chance, events. The low recruitment to Computing in intervention schools was surprising given that the information given to students did not distinguish between the salaries of graduates in Mathematics or Computing. The information also did not distinguish between the earnings of different science graduates but we only observed a significantly lower recruitment to Biology. We found no evidence of difference by gender of socio-economic status in responsiveness to the information.

Table 1: Effect of intervention on student's actual choice of A-levels (N=5,593)

	Odds-ratio	Adjusted Confidence Interval		p-value
		lower	upper	
Biology	0.73	0.54	1.00	0.048
Business	1.00	0.69	1.45	0.990
Chemistry	1.08	0.82	1.43	0.568
Computing	0.61	0.38	0.99	0.045
Economics	1.05	0.73	1.52	0.785
English	1.18	0.94	1.48	0.154
Geography	0.88	0.66	1.19	0.419
History	1.09	0.83	1.43	0.540
Languages	0.95	0.68	1.33	0.774
Maths	1.39	1.06	1.82	0.016
Physics	0.98	0.74	1.29	0.884
Psychology	0.96	0.66	1.39	0.828

Further details of these outcomes and the analysis through which they were derived can be found in publications from the project and listed on the project web site
http://www.birmingham.ac.uk/research/activity/education/cheea/research/subject-choice.aspx

Davies, P., Qiu, T. and Davies, N. (2014). Cultural and Human Capital, Information and Higher Education Choices, *Journal of Education Policy* 29, 6, pp. 804-825.

Other papers are currently under submission and may be obtained from Peter Davies, School of Education, University of Birmingham. P.davies.1@bham.ac.uk

3 Background

Policymakers have expressed concern that recruitment to undergraduate subjects has inadequately responded to employers' demand or national interests (Roberts 2002, European Commission 2003, Browne 2010, HEFCE 2010). These policy statements have argued that relatively high graduate premia for science, technology, engineering and mathematics (STEM) subjects reflect excess demand for STEM graduates and that government interventions are required to boost recruitment to these subjects. In England, policy makers have added modern foreign languages to the list of 'strategically important and vulnerable' subjects in need of government assistance (HEFCE 2010).

This assistance has been provided by subsidies and grants for activities that promote recruitment to subjects which are deemed strategic and vulnerable. This policy approach suffers from several weaknesses. First, it is not well aligned with the UK evidence on variation in graduate salaries (e.g. Chevalier 2011, O'Leary & Sloane 2011, Walker & Zhu, 2011). Whilst some STEM subjects (notably Computing, Mathematics and Engineering) have relatively high graduate earnings, other STEM subjects (notably Biology) and Languages do not. Second, it relies heavily on disputed evidence about the relatively higher externalities arising from STEM subjects than other subjects. Third, and most critically, attracting people into STEM subjects through subsidies is unlikely to be an effective way of attracting people into new STEM graduate jobs if they can switch into other more remunerative employment (e,g, in finance) once they graduate.

Nonetheless, it can still be argued that students should be better informed about the consequences of their subject choices. Students face two problems in forming their expectations of graduate wages: (i) predicting the distribution of wages across graduates of each subject; and (ii) predicting their own future wages within these distributions. Manski (2004) strongly encourages research to gather evidence which enables separation of these two aspects, but previous research has tended to focus either on beliefs about the market average or the wage that a student believes they will earn. This study gathered data which allowed analysis of the relationship between these two beliefs.

A small number of studies have begun to examine the effects on educational choices of providing students with labour market information through a randomized controlled trial. Jensen (2010) found that 14 year-old students in the Dominican Republic who were given information about graduate earnings were more likely to intend to go to university. McGuigan et al. (2012) found that 14-15 year-old students in London who accessed a web site providing information about graduate premia and employment improved the accuracy of their knowledge, but with little effect on their intentions to further study. Kerr et al. (2012) found that school students in Finland who were given information about variation in graduate earnings were less likely to apply for humanities courses in polytechnics and more likely to apply for social science or business and finance in polytechnics. Differences between the effects of these trials may be attributable to the

form of the intervention (in class or online in students' own time) or the context (e.g. country) in which the intervention took place.

This study differs from previous trials in several ways. First, we gathered data on: (i) students' expectations of average graduate wages by subject as well as their expectations for their own earnings; (ii) students' beliefs about the distribution of wages around the average; and (iii) the strength of different motivations in their choice of subject. Second, our intervention took place within normal lesson time and was explained using a structured and pre-planned lesson, in contrast to the web-based intervention reported by McGuigan *et al.* (2012). We hypothesised that providing students with information about graduate salaries would affect their choice of A-level subjects.

4 Research Question and Objectives

The central question was: Would students make better decisions (for themselves and for society) if they were better informed about the labour market implications of studying different subjects?

Project objectives	Associated outcomes
1. To reveal the accuracy of school students' knowledge about earnings of graduates of different subjects and the extent to which accuracy varies by student background.	Evidence which can inform policy towards school students' information needs. Evidence of the extent to which information needs vary by socio-economic group and ethnicity.
2. To develop a one lesson intervention which provides Year 11 students with information on labour market outcomes based on recent research.	A research based intervention to address the 'student information needs' agenda
3. To evaluate, through a randomized controlled trial, the effect of providing labour market information on students' subject preferences and actual choices.	Evidence of a simple intervention which could be used in schools to help students to make well-informed subject choices.

5 Summary of Project Activities

Element	Date finished
Sample identification and recruitment	March-Sep 2011
Establishment and updating of web site	Established and updating
Design of intervention and placebo lessons	Jan-Sep 2011
Collection of baseline data	Sep 2011-Jan 2012
Intervention (and placebo)	Oct 2011-March 2012
Post-intervention collection of data	March-May 2012
Analysis of Y11 data	Jan-Nov 2012
Data collection from Year 12 students with their real subject selections	Oct 2012-Feb 2013
Analysis of Year 12 data	ongoing
Data requested from National Pupil Database and merged with baseline and post-intervention data	Dec 2012-March 2013
Set up a complete dataset	ongoing
Analysis of the complete data (including data imputation)	ongoing
Report writing	ongoing
Dissemination activities	See Section 12 for details

5.1 Ethics

The project design received approval from the Ethics Committee of the University of Birmingham (ERN_10-1340).

5.2 Random Allocation to Intervention and Control Groups

The allocation of schools between the intervention and control groups was carried out by the Medical Trials Unit at the University of Birmingham. The method used was stratified randomisation, with stratification by the three categorical variables: private or state school, mixed or single sex school, whether the A Level points per students for that school in 2010 was above or below the mean for that sector (Private or state). Randomisation was blocked (varying sizes 2-8) and carried out in STATA.

5.3 Design of Questionnaire, Intervention and Control Lessons

The baseline questionnaire (Appendix 1), the Intervention lesson and teacher guidance (Appendix 2), the Control Lesson (Appendix 3) and the Post-Test Questionnaire (Appendix 4) are included as appendices to this report. The baseline questionnaire included background questions on students' cultural capital and motivation in order to identify differences between students which might affect either their initial beliefs (about graduate premia) or subject preferences or the effect of the intervention. The design of the question to gather data on students' beliefs about graduate premia was informed by the literature on expectations (Manski 2004) and was revised following his experience with trial schools. The Post-Test Questionnaire (follow-up questionnaire) repeated

questions regarding the subject preferences and graduate premia after intervention and control lessons.

5.4 **Provision of lesson materials**

Schools were sent either the intervention lesson and guidance or the alternative control lesson and guidance according to the random allocation. The administration of the lessons was devolved to schools on the basis that any subsequent implementation would be through teachers in schools. Therefore, the trial was designed to replicate as far as possible the conditions under which these lesson materials might be used. Schools did not know whether or not they were in the intervention group. Queries about the materials and the implementation process were generally handled by the project administrator, with a minority of questions being referred to the project director.

5.4 Variation in Implementation

There was some variation in the way in which the project was implemented in schools. In a number of cases the school did not include their whole cohort. In each of these cases the reasons for this were explored and, as far as we could tell, these reasons concerned practicability (matters of available staff etc) rather than the exclusion of a particular group type of student who were expected to give different types of responses. We gathered evidence of variation in the implementation of the intervention through interviews with staff and by asking schools to return to us the resource sheets used by students in the lesson. The extent to which the student activity sheets were completed provided an indication of how thoroughly the activities had been implemented in each school. A majority of the schools returned sheets with student names so, for these schools, we will be able to examine the extent to which partial completion of the activities affected outcomes.

5.5 Actual Subject Selection after Implementation of Intervention and Control

After baseline and follow-up data collection (from Year 11 students), we further requested data on actual subject choice from these students when they are in Year 12, as reflections on whether they would make the same choice again. We contacted only schools who returned the follow-up questionnaires to start with, and then we extended this request to all 50 schools to get the maximum numbers of observation. Through email (or later by telephone), we specified the three parts of information that we requested: i) students' actual subject selections for their sixth-form studies; ii) whether or not they continued their studies; and iii) where they continued their studies. We attached the names of Year 11 students from last year who gave their permission for these data to be matched. We also mentioned that if we inadvertently receive any data relating to a student not on this letter we will erase that information from our records. We gathered information from 46 schools, and within these, 37 schools have previously completed both baseline and follow-up questionnaires, whereas 9 schools only returned baseline

questionnaires. Therefore, for the former, we would be able to compare students' original subject preference, after intervention/placebo choice and their actual choice.

5.6 Matching with NPD data

In our baseline questionnaire, we asked students' permission to match their data with information (such as gender, achievement grades and eligibility for free school meals) in the NPD. This match gave us opportunity to make comparisons between students' expected GCSE grades and their actual grades, and it also potentially provided longitudinal evidence from this sample in the future. We requested Key Stage 4 'amended' data for 2011/12 academic year matched to Spring Census 2012 data and prior attainment at Kay Stage 3 and 2. Due to the confidential nature of the data, we agreed that we provided the names of 50 schools and pupils, and the NPD did the matching based on our records, and then sent it back to us. We were informed that the matching was conducted by either getting a direct match on names and school or by conducting fuzzy matching on names, which involves manual checking and also allows for shortened versions of names to be accepted. We have a total of 4369 matched records from the NPD.

6 Sampling

6.1 Procedure used for recruiting schools

- Starting from the 2010 Sixth form performance tables.
- Following Institution Types eliminated: Further Education Colleges and Sixth Form Colleges. Institutions with no name. This left 2617 records.
- All institutions with less than 100 students in KS5 removed leaving 1981 records.
- Restricted to postcodes starting: AL, B, BA. BR, BS, CH, CR, CV, CW, DE, E, EN, GL, HA, HP, IG, KT, L, LE, LU, M, MK, N, NG, NN, NW, OL, OX, RG, RH, RM, SE, SG, SK, SL, SM, ST, SW, TW, UB, W, WA, WD WR, WS, WV. 1156 records. (957 state schools, 199 private schools)
- The sample structure ignores clustering at the classroom level. This raises the possibility that variance which would be attributed to the classroom level has been attributed to the school or individual level. Zhu et al. (2012) investigate the effects for estimates of effects on academic outcomes which ignores clustering at classroom level. They conclude that the implications for results are very small and restricted to cases where the effects of classroom clustering are large.

6.2 Recruitment process

The first contact with schools was through a telephone call to the head teacher's (or principal's) secretary. The secretary was asked to make an appointment for a telephone call with the head teacher. When an appointment for a telephone call was in place, the head teacher was sent information outlining the project and what it would entail for the school. This information formed the basis for an initial conversation with the head teacher. The typical pattern of events thereafter was that the matter was discussed by the school's senior management team. Following this discussion either the head teacher or another member of the senior management would contact me to convey their decision and to discuss, where appropriate, arrangements for implementing the project.

	State Schools	Private Schools
Number contacted	130	60
Number agreed	36	20
Success rate	28%	33%

The sponsorship of the project by the Nuffield Foundation appeared to be an important factor in securing school's willingness to participate, indicating the high credibility which the Foundation enjoys with schools in both sectors. Contact with the school secretary and the head teacher was made by Professor Peter Davies.

We recruited a stratified random sample of 50 schools from a selection of postcode areas in England which covered a full range of metropolitan, urban and rural areas. Restricting

our sample to schools with at least 100 students in their 'sixth forms' and schools enrolling students between the ages of 13 and 18 yielded a total of 958 state schools and 195 private schools. We created two (state and private) randomized lists of schools and invited schools to participate in the order of each list. We stratified the sample to include 20 private schools and 30 state schools. Our sample selection criteria favored schools which were larger than average, with higher than average levels of achievement and lower than average proportions of students from lower socio-economic backgrounds. In fact, almost all the students in the sample expected to gain at least grade C in their GCSE maths and English examinations. This contrasts with national figures: 64% of all students gained at least grade C in English and 58% of all students gained at least grade C in maths. The grade C benchmark in English and math has traditionally been regarded as a minimum qualification at age 16 to indicate a trajectory towards participation in higher education. Moreover, of the students in our sample expecting grades A*-C in English, 54% expected to achieve either a grade A* or a grade A. Of the students in our sample expecting grades A*-C in maths 58% expected to achieve either a grade A* or a grade A. These proportions are more than double (23% for English and 26% for math) the equivalent ratios for all students in the country. Therefore, the proportion of the students in our sample who enrol at research-intensive universities and the proportion of the students in our sample achieve high degree classifications is likely to be well above the national average. Graduates from research-intensive university and graduates with high degree classification have significantly higher earnings than other graduates (Hussain et al. 2009, Walker and Zhu 2011). We therefore anticipated that the students in our sample would expect to have higher graduate earnings than their expectation of the average graduate salary.

189 schools had been contacted by the time that 50 schools firmly committed themselves to participation in the project. Six of the schools which declined to participate had initially indicated that they would participate but then withdrew on the grounds of workload. The majority of the 139 schools which declined to participate did so before any details of the project had been discussed. Nonetheless, we cannot rule out the possibility that policies towards subject choice were different between the schools which agreed to participate and the schools which declined. We therefore compared schools which agreed to participate with those which did not agree. Within our two main groups of schools (state and private) we compared schools which accepted the invitation to participate with those which declined to participate in the project. We compared means for: School size, numbers of students in the sixth form, % of students gaining 5 grades A*-C at GCSE, Value added performance between 16 and 18, % of students' eligible for free school meals and index of multiple deprivation. We found one significant difference for the state schools: schools which agreed to participate had slightly lower recorded value added scores (991 compared to 1004, $p=.004$). There were no significant differences for the private schools.

Schools were asked to issue all Year 11 students with a questionnaire. We gathered 5,012 completed questionnaires. We collected data on students' characteristics including parental education and occupation, ethnicity, and expected examination grades at age 16. We also asked students for permission to match their data with information (such as gender, achievement grades and eligibility for free school meals) in the National Pupil Database. We asked students to indicate the strength of their motivations for higher salary, job status, technical skill, caring for others, environmental concern, creativity, enjoying the university experience in (i) their intentions towards participation in university and (ii) the major at university. We asked students whether they wanted to: (i) continue in full-time study after the age of 16; (iii) which subjects they wanted to study between the ages of 16 and 18 and (iii) they wanted to study at university. We also asked for their expectations of the difference a university degree would make to their salary and their confidence in this prediction. Finally we asked them for their expectations of the average, lower quartile and upper quartile salary for graduates in each of 11 subjects. For each subject we asked for their expectation of the salary they expected if they were to study that subject at degree level.

Twenty per cent of students did not answer the questions asking about their beliefs about graduate salaries and their earnings expectations. Of those students who answered the questions about expected graduate salaries, roughly twenty per cent did not provide an answer to the question asking them about their expectations of *their own* salaries. We analyzed these two sub-groups of students to check whether non-completion and found no association with intentions to go to university or math achievement, after controlling for other factors. Since data on subjective probabilities are constructed in mathematical terms. Students with lower levels of achievement in maths may finder it harder to complete questions about their expectations.

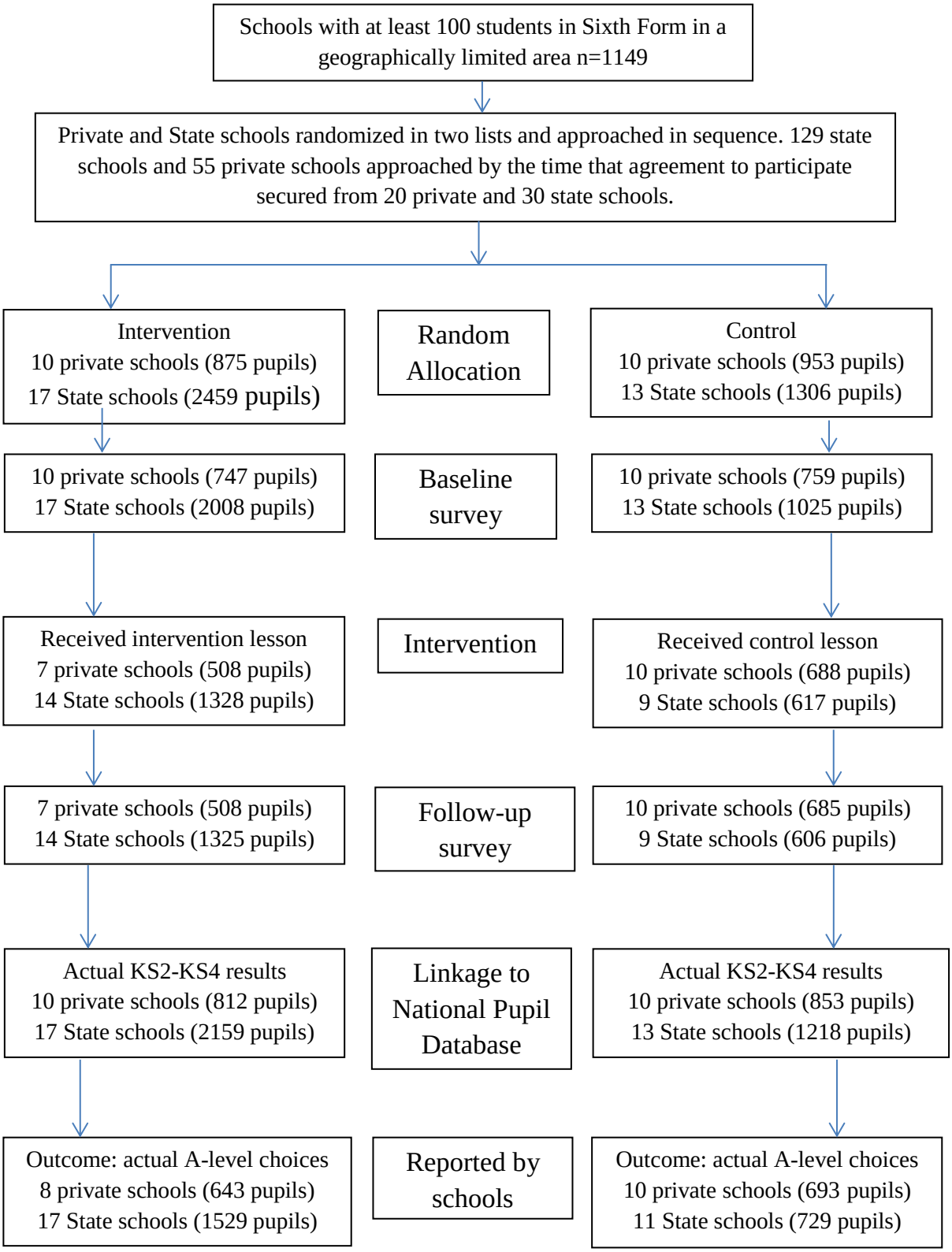
6.3 Sample Attrition

	State Schools	Private Schools	Total
Schools Approached	130	60	190
Schools Agreed	36	20	56
Acceptance rate (%)	28	33	29
Returned First Questionnaire	30	20	50
Returned Second Questionnaire	23	17	40

A majority of the schools which withdrew from the project after agreeing to participate cited work pressures or staff illness as their reason for withdrawal. However, four schools (14% of those initially agreeing which were allocated to the intervention group) withdrew from the project citing disquiet with providing students with information about future salaries. A project co-ordinator in a private school referred to 'serious concerns about

appearing to reinforce … in pupils' minds the relationship between perceived success in life and financial reward.' At another private school the co-ordinator explained that the school was withdrawing because of their 'fear would be that students would take such information entirely at face value and that, in some cases at least, make them reassess their A-Level options at this stage'. A co-ordinator in one state school wrote that 'we found the focus on potential earnings as a reason for A Level choice to the exclusion of any other factors e.g. job satisfaction most uncomfortable. We are also unhappy with highlighting the correlation between higher earnings and Science degrees.' Another state school explained its withdrawal from the project on the basis that teachers 'raised a concern that the survey focuses on outcomes based on highest potential earnings. This is not the only reason for pursuing further education, we have a considerable number of students applying for non academic courses and those following the A level path have chosen their courses based upon interests and aptitude'. The lesson materials did not, of course, suggest that future earnings should be the only consideration in students' subject choice. However, teachers in a minority of schools were unhappy, in principle, that information about future earnings should be presented to pupils and were worried that this information might affect subject choice. Details of the sampling and attrition are presented in Figure 1.

Figure 1: Flowchart of sampling, allocation and attrition



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Without Classroom-Level Information. *Educational Evaluation and Policy Analysis* 34, 1, pp. 45-68.

Appendix 1 Plans and expectations about future work and study

PLEASE TICK THE BOX YES OR NO TO EACH OF THESE QUESTIONS	YES	NO
I have been given a copy of the information sheet explaining about this questionnaire and I understand that it is part of a research project.		
I am willing for my answers to be used in the research project		
I am willing for my answers to these questions to be matched up with the information (such as my exam results) which is held on the National Pupil Database		
I understand that my answers will be held confidentially and that I will not be identified any reports by the research team.		

1. Name			
First Name		Family Name	

2. How would you describe your ethnic background? (tick box)					
Black-Caribbean		Indian		White	
Black African		Pakistani		Chinese	
Black-Other		Bangladeshi		Other Ethnic Group	

3. Use the letters on the following diagram to answer 3A and 3B					
Kitchen Worker Labourer Office Cleaner Window Cleaner	**D**	Architect, Accountant Director, Doctor Lawyer, Vet	**B**	Computer Operator, Nurse, Secretary, Sales Rep Shop Assistant	**E**
Bus Driver Bricklayer Carpenter Cook Plumber Electrician Car Mechanic Hairdresser	**A**	Aircraft Pilot, Engineer Manager, Police Officer Teacher	**F**	Bus Conductor, Care Assistant, Farm Worke Postal Delivery Worker Telephone Operator	**C**
3a. Which group contains jobs that are most similar to the one your mother does (did)?					
3b. Which group contains jobs that are most similar to the one your father does (did)?					
3c. Which group contains jobs that are most similar to the one(s) you are aiming at by the time you are 30?					

4. Please tick Yes, No or Don't Know for each question						
4a. Has your mother ever been to university?	Yes		No		Don't Know	
4b. Has your father ever been to university?	Yes		No		Don't Know	

5. What grades do you expect to get for GCSE?			
			My Expected Grade
English Language			
Mathematics			
Science (if you have grades for separate sciences use the rows below)			
Subject	Grade	Subject	Grade
Subject	Grade	Subject	Grade

6.					

7. How often do you do each of these activities in your spare time?					
		Often	Sometimes	Hardly Ever	Never
(a)	Watching popular entertainment on television				
(b)	Going to Art Galleries or Museums				
(c)	Going to the Theatre				
(d)	Going to Classical Music Concerts				
(e)	Playing a Musical Instrument				
(f)	Listening to Classical Music				
(g)	Keeping up with current affairs on TV				
(h)	Keeping up with Current Affairs on the Radio				
(i)	Keeping up with Current Affairs by reading a 'Quality' Newspaper (or the web site of a quality newspaper/ BBC etc.				

8. About how many books were there around your family's house when you were 14 years old?	
(Tick whichever is closest to your best estimate)	
None	
1 or 2	
Around 10	
Around 20	
Around 50	
Around 100	
Around 200	
Around 500	
1000 or more	

9. How often do your parents or carers talk with you about each of these topics?					
	How often do your parents or carers	Often	Sometimes	Hardly Ever	Never
(a)	Talk with you about your school work				
(b)	Talk with you about current events in society, politics or the economy?				
(c)	Talk with you about books you or they have been reading?				
(d)	Talk with you about your choice of subjects at school				

(e)	Talk with you about the effect of your school work on your future employment				

10. Which of the following statements About <u>next year</u> most applies to you?	
	(X)
I definitely intend to stay at school or college	
I will probably stay at school or college	
It is unlikely that I will stay at school or college	
I will definitely not stay at school or college	

11. If you were to carry on with your full-time education after your GCSEs how likely would it be that you would choose to study each of these subjects? (Put a X in the appropriate column for each row)

	Definitely Not	**Unlikely**	**Possible**	**Likely**	**Definitely**
Art					
Biology					
Business Studies					
Chemistry					
Computing					
Design and Technology					
Economics					
English					
Geography					
History					
Languages (e.g. French or German)					
Maths					
Media Studies					
Music					
Physical Education					
Physics					
Psychology					
Travel and Tourism					

12. Which of the following statements most applies to you? (Put a cross against one option)	
Options	**(X)**
I definitely intend to go to university	
I will probably go to university	
It is unlikely that I will go to university	
I will definitely not go to university	

13. How important are each of the following in deciding whether or not to go to university? (Please put in rank order)	
Motivation	**Rank (1-6) Where 1 is the MOST important**
Developing new friendships and contacts	
Enjoying the university experience	
Higher Salary	
Higher Status of job/profession	
Expert knowledge in a subject	
Broader awareness of culture and society	

14. A) How much difference do you think going to university would be likely to make to <u>your</u> annual earnings by the time you are 30? (Tick 1 box)						
At least 10% less	**5% less**	**No difference**	**5% more**	**10% more**	**15% more**	**At least 20% more**

b) How confident that your earnings prediction in 13(a) is accurate? (Tick 1 box)				
Very unsure	**Not Confident**	**Quite Confident**	**Confident**	**Very Confident**

15. How important will each of the following be in deciding <u>which subject</u> to study at university? (Please <u>put in rank order</u>)	
Motivation	**Rank (1-6) Where 1 is the MOST important**
Creativity of Job	
Opportunity to care for or develop others	
Opportunity to make a positive contribution to society/environment	
Salary	
Status of job/profession	
Technical knowledge and skill required for future employment	

15 the average University graduate earns roughly £30,000 by the time they are 30. Using this figure as a benchmark, <u>what difference do you think the subject of a degree makes</u>?

In the Table below put AV to show how much you think the average graduate in that subject earns. Put an H to show how much you think a graduate just in the top quarter of earners for that subject would earn and a L to show how much you think a graduate just in the bottom quarter of earners for that subject would earn.

In the last column put a figure to show how much you think you might earn if you studied for a degree in this subject.

	Thousands of pounds in salary at age 30											
	15	20	25	30	35	40	45	50	55	60	65	
Example Subject 1		L		A V	H							£40,000
(An average graduate in Subject 1 would earn £30,000, with someone just in the top quarter of earners would earn £35,000 and someone in the bottom quarter of earners would earn £20,000. I think I would earn £35000)												
Example Subject 2				L		A V		H				£35,000
(An average graduate in Subject 2 would earn £40,000, with someone just in the top quarter earning £50,000 and someone just in the bottom quarter earning £30,000. I think I would earn £35,000)												How much I think ***I*** would earn
	15	20	25	30	35	40	45	50	55	60	65	
Art												
Business Studies												
Education												
Engineering												
History												
Languages												
Law												
Politics or Sociology												
Maths and Computing												
Physics or Chemistry												
Medicine Related												

Appendix 2 Lesson Materials for Intervention Schools

Activity 1: Average salaries for different subjects

Summary: This activity is designed to draw students' attention to average differences in earnings of graduates with different degrees. The task requires you to randomly divide students into 2 groups and then to give students a series of options in which they can either stick with the salary they have from the previous round or switch to another option. Once students have decided whether to stick or switch you will tell them what they would earn (or would have earned) if they switched to the new option. The outcomes are different for the two groups (Males and Females). See Table 1 on Page 4.

Procedure

1. **Randomly Allocate the students into two groups 1 and 2**. Tell Group 1 they will be the 'females' and Group 2 the 'males'. Tell them that that they will start with an income that is average for people with at least 2 A levels **who choose not to go to university**.
2. The annual income for **Group 1 is £22000 and for Group 2 £27500.**
3. Tell students they will now face a series of choices about whether to continue with their study and if so what to study and they will be told what they are likely to earn as a result.
4. The first choice is whether to go out to work with A levels or to study for an Arts degree (e.g. Art History, English, History of Philosophy). Ask students to commit to one of these choices and record it on their form.

So a Student in Group1 who decided to do an Arts degree would have a student sheet which looked like this after you have given them the option of sticking with their previous

	Group 1 (Circle) 2	Typical annual earnings	Change in Annual Earnings
	Leaving education with 2 or more A levels	£22000	
1	Arts Degree		
2			
3			
4			
5			
Etc.			

5. **Announce to students that for those who switched to an Arts Degree the new salaries are:**

	With Arts Degree
Group 1	26000
Group 2	26500

So a student in Group 1 who switched an Arts degree would now have a student form looking like this:

	Group (Circle) 1 2	Typical annual earnings	Change in Annual Earnings
	Leaving education with 2 or more A levels	£22000	
1	Arts Degree	26000	4000
2			
3			
4			
5			
Etc.			

The figure in this final column is the difference between the £22000 and the £26400.

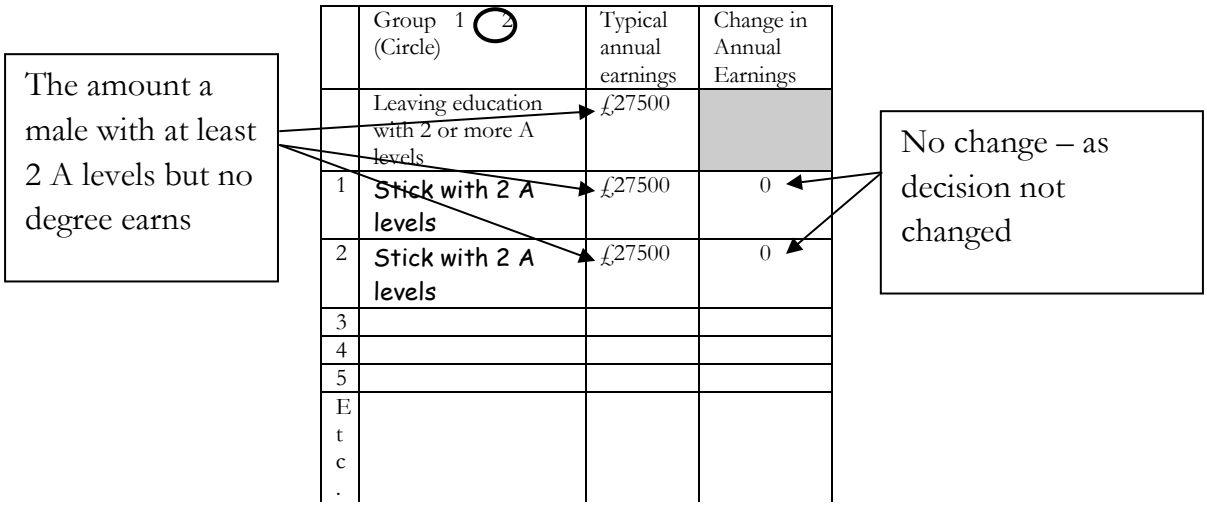
6. **Now give students the option of sticking with their current choice or opting for a History degree (point out that History is one kind of Arts degree)**

Once they made their choices, announce the salary outcomes. For those who choose to switch to a History Group are:

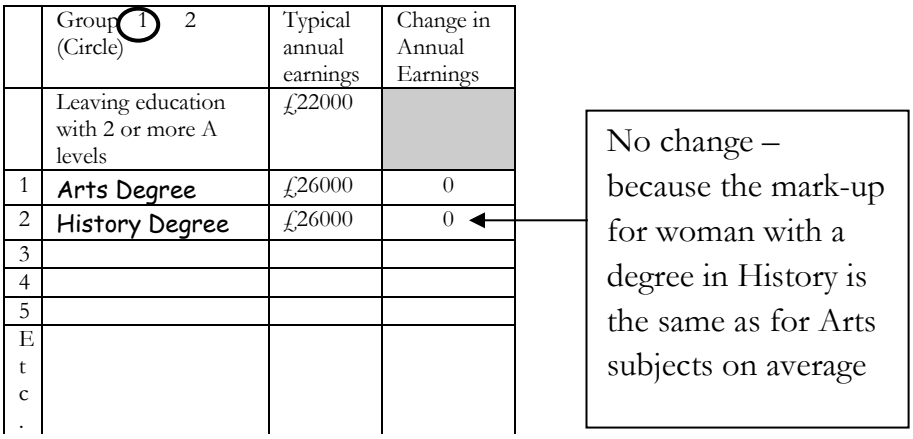
	With History Degree
Group 1	26000
Group 2	30000

Ask students to write the salary they now get (according to their choice) in the middle column and work out the extra salary they got in the third column.

A student in **Group 2** who decided to stick with leaving after A levels should have a record sheet that looks like this:



A student in **Group 1** who decided to switch first to an Arts degree and then to a History degree should have a record sheet that looks like this:



7. Continue this process (Give students the choice of sticking with their current choice – e.g. leaving after A levels or an Arts Degree- ask them to write their choice in the first column, announce the salaries for the new degree option and get students to write the salary for their choice in the middle column and the change in salary in the right hand column). Use the figures in Table 1 which follows.

Table 1 The sequence of subjects and average earnings for each group.

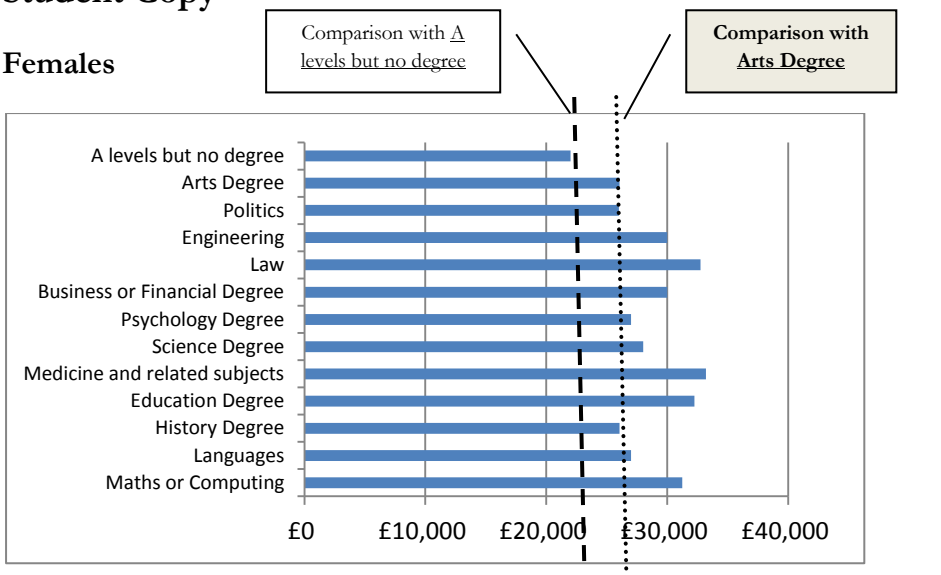
	Group 1 2 (Circle)	Typical annual earnings		Change in Annual Earnings
		Group 1 (Females)	Group 2 (Males)	
	Leaving education with 2 or more A levels	£22000	£27500	
1	Arts Degree	£26000	£26,500	
2	History Degree	£26000	£30,000	
3	Education Degree	£32250	£33,500	
4	Science Degree	£28000	£33,000	
5	Psychology Degree	£27000	£31,500	
6	Business or Financial Degree	£30000	£33,500	
7	Law	£32750	£34,000	
8	Engineering	£30000	£36,750	
9	Politics	£26000	£30,500	
10	Maths or Computing	£31250	£36,500	
11	Languages	£27000	£31,500	

Activity 2: Variations in the distribution of salaries for different subjects

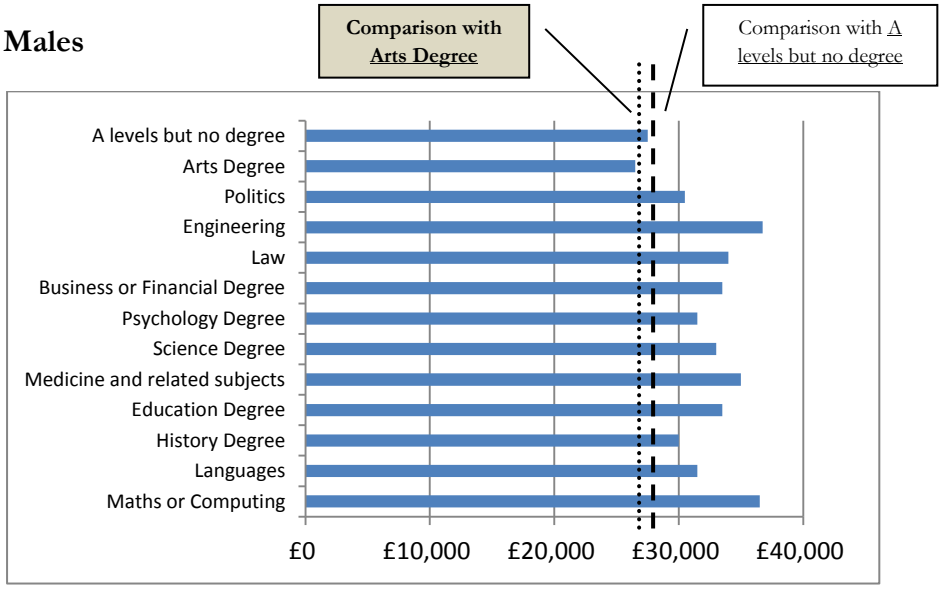
Summary: This activity is designed to consolidate students' awareness of the information used in the first activity. You may choose to organise this as an individual or a paired activity according to what you think is most suitable for the class. Two vertical lines on each bar chart are intended to draw students' attention to two comparisons: with average earnings of a student who has at least two A level passes but does not go to university and average earnings of a student who graduates with any degree in the category 'Arts'.

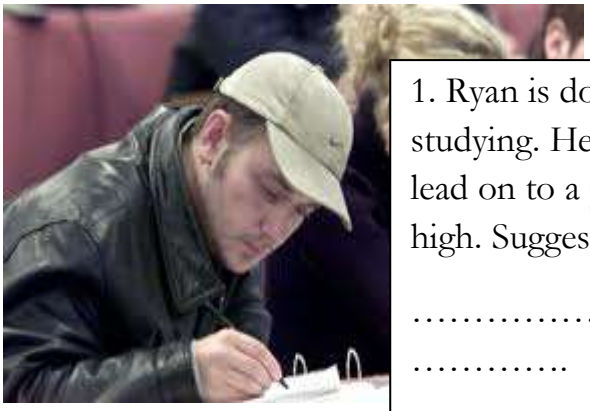
Student Copy

Females



Males





1. Ryan is doing well in each of the subjects he is studying. He wants to study a subject which is likely to lead on to a job where his earnings will be relatively high. Suggest three subjects he might consider

…….
…….

…….
…….

…….

2. Steph also intends to go to university. She is particularly interested in History, Politics and Education. She wants to study a subject which is likely to lead on to a job where her earnings will be relatively high. Which subject does it make most sense for her to choose?

…….

3 Do the salaries differences encourage men who are very motivated by high earnings to study the same subjects as women who are very motivated by high earnings? (explain your answer)

…….
…….

…….
…….

…….
……..

…….
……..

Teacher's Copy

Follow on questions

1	Ryan's choice	Engineering, Maths and Computing, Law offer the highest earnings on average relative to other subjects in the list (Accounting and Economics also offer high earnings, but the average for all Business subjects is somewhat lower)
2	Steph's choice	Education offers the highest earnings amongst these three subjects.
3	Female/male differences	For every subject, the difference between leaving education after A levels and going to university was greater for women. For some subjects (notably Law, Education and Medicine), there was little difference in the relative advantage for men and women.

Activity 3: The difference a Degree makes to how much you earn after you take account of fees and lost earnings

Summary: This activity is designed to draw students' attention to some of the factors which cause graduate earnings from the same subject to differ between individuals. The true/false/uncertain questions are intended to focus students' attentions on salient comparisons. The last couple of questions are intended to encourage them to think carefully about what the data do and do not suggest.

Student Copy

Degrees are classified differently from A levels and other qualifications gained at school or college.

		% of graduates in 2010
Top Classification	**1st ('First')**	**14%**
	2i ('Two-one')	**49%**
	2ii ('Two-two')	**27%**
	3rd ('Third')	**6%**
Bottom Classification	**Unclassified**	**4%**

Researchers have calculated the financial benefits of different degrees after taking off the cost of:

- The Tuition Fee paid to the university.
- The money you would have earned if you had got a job instead of going to university.

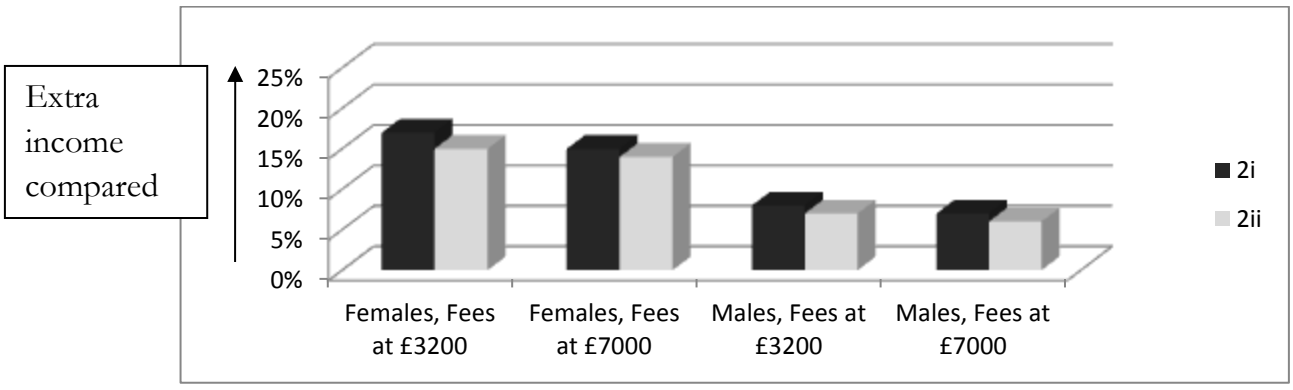
The bar charts for this activity show how much a difference a degree makes *after* taking account of fees and lost earnings.

For each of the statements look at the bar charts and decide whether the statement is true, false or uncertain according to these bar charts.	
	True/False or Uncertain?
1. Doing a science degree (rather than getting a job at 16) makes more difference to the earnings of a woman than a man.	
2. Doing a Law, Economics or Management Degree makes more difference than other subjects to a man's earnings.	
3. An increase in university fees from £3200 per year to £7000 a year halves the difference a degree makes to earnings.	
4. Graduates who get a 2i degree earn about 10% more than graduates who get a 2ii degree.	
5. Choice of degree subject makes much more difference to a man's future earnings than to a woman's future earnings.	
6. Every woman who studies for an engineering degree earns between 10 and 15% more than a woman with A levels who does not go to university.	
7. Women who get a Mathematics degree earn about twice as much as men who get a Mathematics degree.	

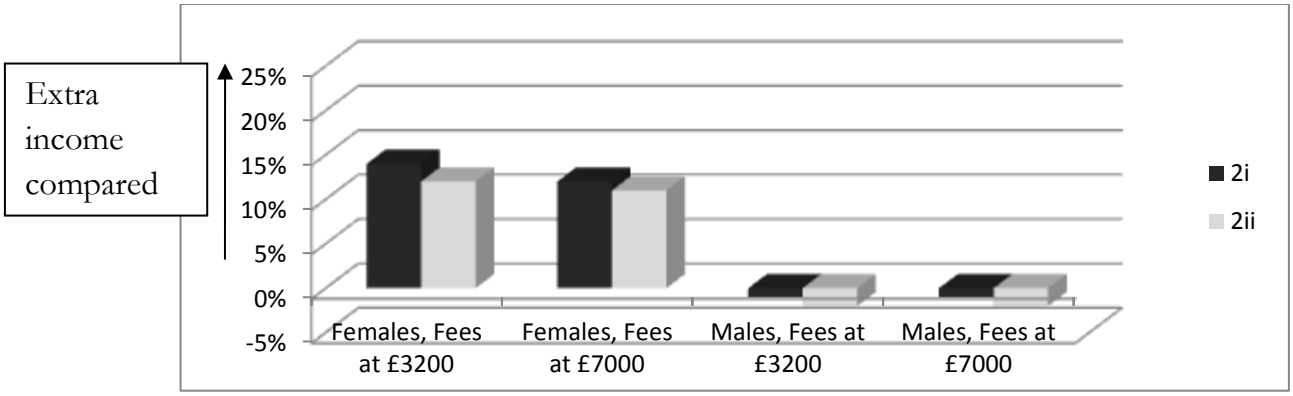
Science, Technology, Engineering and Mathematics Degrees

Law, Economics and Management Degrees

Joint Degrees (Combinations of two or more subjects)



Other Social Science subjects (i.e. not economics) and Arts degrees



Teacher's Notes

You may find it helpful to work through an explanation of one of the bars before asking students to start the task.

For example, the first two bars (one black, one grey) in the 'STEM' chart show females graduates' earnings compared to leaving schools with just A levels, after taking off fees of £3200 and lost earnings when studying. They show that on average a female with a 2i in a STEM subject was 15% a year better off with a STEM degree than with just A levels and a female with a 2ii in a STEM subject as almost exactly the same – very slightly less than 15% a year better off.

The bar charts suggest that there is a considerable difference for males, but little difference for females between these subject classifications. It is important to note that the earlier data (Activities 1 and 2) show that there is considerable difference between subjects *within* each of these classifications. The class of degree makes a small difference (mostly around one percentage point) in the earnings of graduates in three of the classifications (STEM, Combined and Other Social Science and Arts) but quite a big difference for graduates in Law, Economics and Management. This may reflect a higher proportion of recruitment from these subjects by large companies particularly in the City of London. A change in fees as shown in the table also makes a rather modest difference – often only around one percentage point.

Note on the data

Activities 1 and 2

The figures used in these activities are based on calculations of the difference that a degree subject makes. These calculations are taken from a study by O'Leary, N. & Sloane, P. (2005) The return to a university education in Great Britain, *National Institute Economics Review*, 193(75), 75-89. This study uses data from 1994-2002 so it is relatively old. These researchers have published another paper more recently O'Leary, N. & Sloane, P. (2011). The Wage Premium for University Education in Great Britain during a Decade of Change, *The Manchester School*, 79, 4, pp. 740-764. This more recent paper compares the periods 1997-1990 with 2004-06 during which there was a substantial rise in the number of graduates. It reports little change in the additional earnings of graduates or the relative position of graduates in different subjects. This analysis is slightly less fine grained the earlier analysis published in 2005 and that is why relative figures have been taken from the earlier study. The study presents 'mark-ups' (in percentages) for different degrees. More recent average absolute earnings figures have been used to give baseline earnings and the differences calculated using the percentages from the O'Leary and Sloane study of 2005.

There is broad agreement between these and other studies of differences in earnings of graduates from different subjects. But as with all data, these figures give us indications rather than hard and fast certainties and the figures are averages calculated from the earnings of different students at different universities. There should be opportunities in class discussion to remind students about this.

Activity 3

The figures for the proportion of students gaining each class of degree in 2010 are from the Higher Education Statistical Agency. The calculations of the benefits of a degree after taking account of tuition fees and lost earnings are taken from Walker, I. and Zhu, Y. (2010) Differences by degree: Evidence of net financial rates of return to undergraduate study in England and Wales. Discussion Paper 5254 IZA. Bonn.

The figures are calculated on the basis of graduate earnings in the period 1994-2009. The studies by O'Leary and Sloane (and others) have found little change in the financial benefits of one degree compared to another over this period.

Ian Walker and Yu Zhu have published several analyses of the economic benefits of degrees. The IZA is a leading European organisation publishing peer reviewed research. As usual with research on this topic the data are from the Labour Force Survey which is a national randomised survey. As with all such sources it is important to note that this source only allows a rough estimate. Many of the respondents to this survey do not provide information on their earnings. So whilst the sample sizes are sufficient for statistical comparison we cannot be sure that differences between the people who provided information are the same as the people who did not provide information about their earnings. That said, there are no strong reasons for believing that this is likely to be the case.

Appendix 3 Teachers' Notes on the Materials for the 'Control/Placebo' Lesson

Lesson Outline

The activities in this lesson are designed to help students **to develop a critical approach to information that they encounter when thinking about subjects to study after the age of 16**. The structure of the lesson is taken from one 'student choice' web site (Studential, at http://www.studential.com/further_education/alevels/choosingyouralevels) which encourages students to think about:

- The subjects they enjoy
- The workload of different subjects
- Their own strengths
- 'Traditional' vs. 'Non-traditional' subjects

The lesson draws on information relevant to the last two of these points:

(i) A leaflet produced by the Russell Group Universities titled 'Informed Choices' and available on the web at http://www.russellgroup.ac.uk/media/informed-choices/InformedChoices-latest.pdf. This leaflet includes a section about 'preferred' and 'non-preferred subjects'.

(ii) A Report by researchers at the University of Durham's Curriculum, Evaluation and Management Centre titled 'Relative Difficulty of Examinations in Different Subjects (2008, p.5). This is available on the web at http://www.score-education.org/media/3194/relativedifficulty.pdf

The lesson format consists of a series of activities. You may wish to organise these as individual, paired or small group activities according to what will work best with this class. You may also punctuate the activities with whole class discussion of students' answers.

List of Activities

Activity 1 To introduce four perspectives (enjoyment, workload, personal strengths and 'traditional vs non-traditional subjects).

You may wish to ask students to read the information and complete tasks 1a-1c before pausing for a brief review of their answers. When this activity was trialled it took students about 10 minutes.

Task 1a How reliable (how true) are these statements?

Task 1b How important are each of these factors to you when thinking about what to study after age 16? (Put a tick in one of the columns for each row)

Task 1c Which of these statements is closest to what is meant by Voice 4?

Activity 2 To evaluate web site reliability in relation to information about so-called 'banned' subjects

You are advised to ask students to complete Tasks 2a-2c and then to stop whilst you review their answers with them. The notes on Activity 2 provide information about the booklet produced by the Russell Group universities. These notes list the subjects which, according to the Russell Group, are 'facilitating subjects'. There is no absolute 'right' answer' to Tasks 2b-2c, but you are encouraged to se the list from the Russell Group as a perspective to discuss. The notes also give you the web address for this booklet. In reviewing these tasks it may be useful to check that students know that the majority of universities do not belong to the 'Russell Group'. This activity took about 15 minutes when the lesson was trialled.

Task 2a The 'Russell Group' of Leading UK universities recently produced a list of sixth form subjects which they refer to as 'facilitating subjects' which will be good to do for a wide range of degree subjects at University.

Task 2b Choose ONE subject which you think would be good to do for a wide range of options at university and explain why you think it would be a 'facilitating subject'.

Task 2c Choose ONE subject which you think would NOT be good to do for a wide range of options at university and explain why you think it would NOT be a 'facilitating subject'. Notes on Activities

Task 2d (Only complete this task once you have reviewed your answers to Task 2a). Now you have this additional information how reliable is Voice 4 in the first task? Could you re-write the statement in Voice 4 so that it is more reliable?

Activity 3 To review the notion of students' strengths in relation to a comparison of subject difficulty

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This activity took about 25 minutes when the lesson was trialled. You might want to divide it into two parts with a review after Task A. You are advised to use evidence from a report by researchers at the University of Durham in reviewing Task B with students. Some key points from this research are provided in the notes on this Activity. The notes also provide a web address for the report. There is some conflict between the use of the term 'soft' subject in the Russell Group document and the comparison of subject difficulty provided by the researchers from the University of Durham.

Task 3a Another suggestion (Voice 3) on the web site is that you should aim to study your best subjects. How well do you think you know how easy or hard for you each of these subjects would be if you studied them in the sixth form? Decide whether you think each subject would be easy, medium or hard for you and then tick one of the columns to show how sure or unsure you are about your judgement.

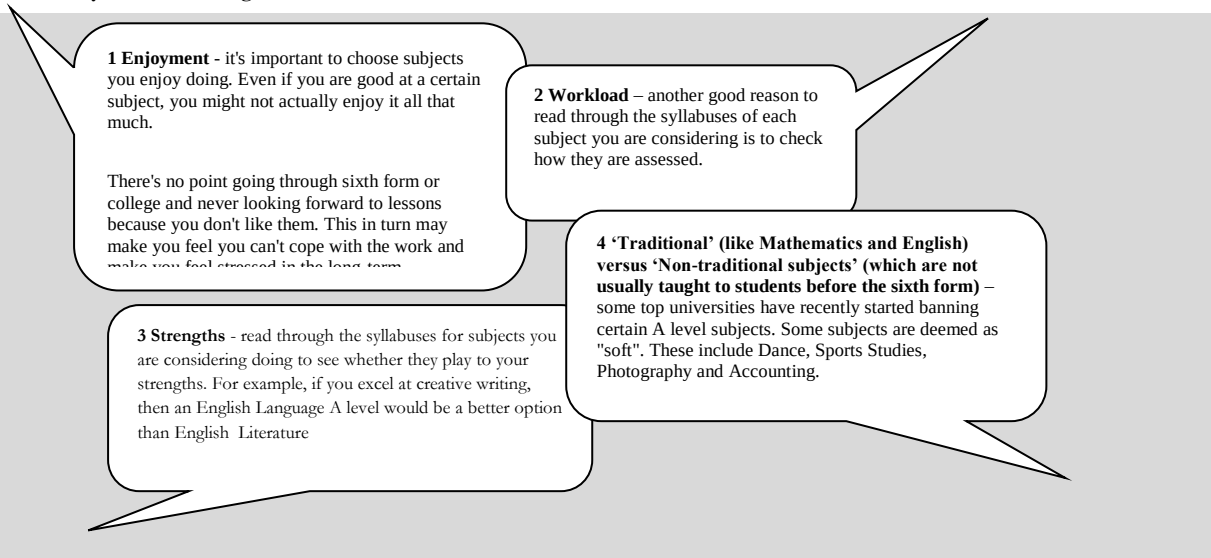
Task 3b How hard are each of these subjects for the average sixth form student?

Notes on Activities

Activity 1 To introduce the four perspectives (enjoyment, workload, personal strengths and 'traditional vs non-traditional subjects.

Voice 4 is adapted from the Studential web site. The web site uses the word 'blacklist' which has been replaced in this Activity by the term 'banned' in line with the reporting of a story in the Guardian Friday 20 August 2010(http://www.guardian.co.uk/education/2010/aug/20/a-level-subjects-blacklist-claim). This change is made to avoid use of the term 'blacklist' which it would be inappropriate to report without encouraging a critical discussion of the term. When trialling this activity some students asked about the meaning of the labels 'traditional' and 'non-traditional' subject. Some exemplification was added in the brackets)

1. **Here are some things which a 'student advice' web site (Studential) tells you to think about when choosing what to study between the ages of 16 and 18.**



Activity 2 To evaluate web site reliability in relation to information about so-called 'banned' subjects

Voice 4 in Activity is refers to the Russell Group publication 'Informed Choices'. This publication effectively divides sixth form subjects into three categories

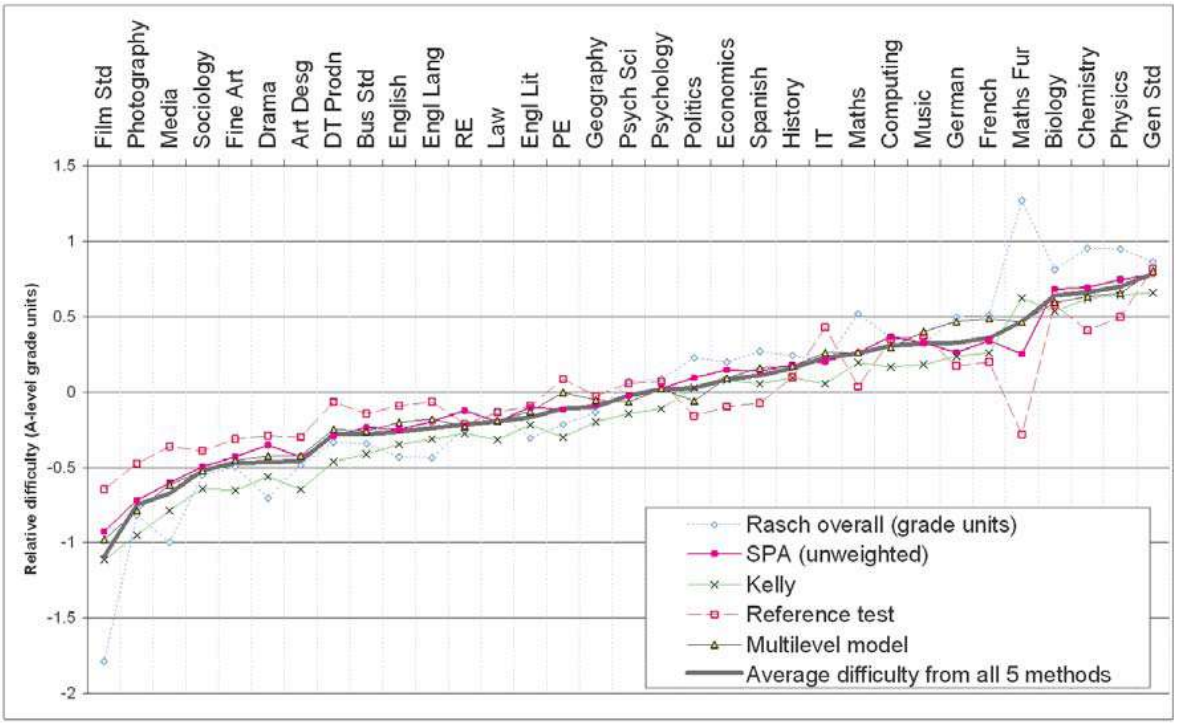
'Hard' Subjects		**'Soft' Subjects**
Facilitating Subjects	**Other Subjects 'providing suitable preparation for University Entry'**	**Subjects 'with a practical or vocational bias'**
"Subjects that are required more often than other subjects"	"Subjects were less often required for entry to an undergraduate degree"	"Students who take one 'soft subject' do not generally experience problems applying to a Russell Group university."
Biology	**Economics**	**Art and Design**
Chemistry	**Religious Studies**	**Business Studies**
English (Literature)	**Welsh**	**Media Studies**
Geography	**(amongst others)**	**Photography**
History		**(amongst others)**
Languages (Ancient and Modern)		
Mathematics and Further Mathematics		

Therefore, the reference to some subjects being banned (or 'blacklisted') is a distortion of the information released by the Russell Group. The booklet advises students to include *no more than one* of the subjects in its 'soft' subjects list. In addition, the booklet refers to some subjects (it lists Economics, Welsh and Religious Studies) which it suggests will be considered as academically equivalent to the subjects in the Facilitating' List.

Activity 3 To evaluate the idea of a 'soft' subject referring to evidence provided by the Curriculum, Evaluation and Management Centre at the University of Durham

A Report by researchers at the University of Durham's Curriculum, Evaluation and Management Centre titled 'Relative Difficulty of Examinations in Different Subjects (2008). This is available on the web at http://www.score-education.org/media/3194/relativedifficulty.pdf

Page 5 of the report includes a graph comparing several estimates of differences in subject difficulty.



Some points of interest in this Figure are:

- It is not easy to see a clear cut division of 'hard/traditional' and 'easy/non-traditional' in this comparison. For example English and Business Studies are at the same position in terms of level of difficulty and you might not imagine this from the Russell Group document. Likewise Geography and PE appear at about the same position.
- Whilst Maths appears above average difficulty in the comparison it is not that much different from History and Economics.
- According to this information the answers to Task 3b would be

Biology	Hard	French	Hard
Business Studies	Easy	General Studies	Hard
Design and Technology	Easy	Geography	Medium

(Production)			
Drama	Easy	Mathematics	Medium
Economics	Medium	Physics	Hard
English	Easy	Psychology	Medium

Appendix 4 Follow up questionnaire

Name			
First Name		Family Name	

Please note – if you or your parent/carer has indicated previously that you would prefer for your responses not to be recorded in this research project this will apply also to your responses to this follow-up questionnaire.

Question 4 asks you to comment on your experience of the project lesson. If you are unclear about which lesson this was, please ask your teacher for clarification.

Labour market expectations, relative performance and subject choice

Project information sheet

The School is participating in a project run by the University of Birmingham and funded by the Nuffield Foundation. This project is looking at students' knowledge of the implications of their choices at age 16 and the effect that information has on their choices. The results of the study will help the school in its planning to assist students in making well-informed choices. It will also help national policy in showing how particular kinds of information can help students to make 'well-informed' choices.

The project will involve a questionnaire to be completed by Year 11 students, a lesson on sixth form choices and an associated web page which parents and students can access.

You have been asked for permission for your questionnaire answers to be used in the study.

You have also been asked to give your permission for your questionnaire answers to be matched with your examination results from the National Pupil Database. This is so that the project team can check whether students with different patterns of examination results have different plans for sixth form study. The completed questionnaires and the matched information from the National Pupil Database will be kept securely in a locked cabinet which is only accessible to the research team.

There will be a project report and associated publications. You will not be named or identified in any way in these publications.

1. If you were to carry on with your full-time education after your GCSEs how likely would it be that you would choose to study each of these subjects? (Put a X in the appropriate column for each row)

	Definitely Not	Unlikely	Possible	Likely	Definitely
Art					
Biology					
Business Studies					
Chemistry					
Computing					
Design and Technology					
Economics					
English					
Geography					
History					
Languages (e.g. French/German)					
Maths					
Media Studies					
Music					
Physical Education					
Physics					
Psychology					
Travel and Tourism					

2 The average University graduate earns roughly £30,000 by the time they are 30. Using this figure as a benchmark, <u>what difference do you think the subject of a degree makes</u>?

In the Table below put AV to show how much you think the average graduate in that subject earns. Put an **H** to show how much you think a graduate just in the top quarter of earners for that subject would earn and an **L** to show how much you think a graduate just in the bottom quarter of earners for that subject would earn.

In the last column put a figure to show how much you think you might earn if you studied for a degree in this subject.

	Thousands of pounds in salary at age 30											
	15	20	25	30	35	40	45	50	55	60	65	
Example Subject 1				L		A V		H				£35,000
(An average graduate in Subject 2 would earn £40,000, with someone just in the top quarter earning £50,000 and someone just in the bottom quarter earning £30,000. I think I would earn £35,000)												How much I think ***<u>I</u>*** would earn
	15	20	25	30	35	40	45	50	55	60	65	
Art												
Business Studies												
Education												
Engineering												
History												
Languages												
Law												
Politics or Sociology												
Maths and Computing												
Physics or Chemistry												
Medicine Related												

3 Do you agree with each of the following statements about the lesson you had giving information for choosing subjects to study after you are 16? Put a cross in the appropriate column for each question.

	Strongly Disagree	**Disagree**	**Uncertain**	**Agree**	**Strongly agree**
a. I understood all the information					
b. I knew all that information before					
c. I think the information was reliable					

Appendix 5 The brief abstract for AERA 2013 annual conference

Expectations of Graduate Wages: Students' Pre-College and College Choices

Peter Davies[1], Tian Qiu[1] and Neil Davies[2]

[1] Centre for Higher Education Equity and Access, University of Birmingham, UK

[2] Centre for Causal Analysis in Translational Epidemiology, University of Bristol, UK.

Abstract

This study investigates relationships between secondary school students' beliefs about effects of university choices on future earnings and intentions to study particular subjects in their final two years of schooling. The data are drawn from a survey of 5,012 15-16 year-old students attending 50 schools in England. Whilst re-drafting the paper for presentation at the AERA conference we have found that we had too much data to address college and pre-college choices in the same paper. We have a paper on college choices which we will be happy to send to any interested parties. In this paper we concentrate on the wash-back of beliefs about graduate salaries on to students' subject choices in their final years of schooling.

Appendix 6 The brief abstract for SRHE 2012 annual conference

Cultural and human capital, information and higher education choices

Peter Davies and Tian Qiu
Centre for Higher Education Equity and Access, University of Birmingham

Abstract
This study extends previous research by using data from a fairly large random selection of secondary schools to (i) examine the distinctiveness of three elements of cultural capital: highbrow culture, Scientific, technical and media oriented framing, and 'Strategic interaction between education and schooling' and (ii) analyse associations between measures of cultural capital, students' beliefs about graduate premia, students' confidence in their beliefs about graduate premia and their expectations about participation in higher education. These associations are relevant to the relationships between cultural and human capital in the context of college choices.