CAMBRIDGE ASSESSMENT

Prior learning of undergraduates in UK higher education institutions

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Background

In a climate of significant reform in education it is crucial to better understand how level 3 qualifications, both academic and vocational, are used by young people to reach their goals, in particular, to progress to higher education and employment.

Students applying to study a course in a higher education institution have to make two choices: what subject to study and at which institution. These decisions are influenced by a range of factors, for example their personal interests, their socio-economic background and, particularly, their prior qualifications and performance.

Aims of the study

The main aim of this work was to provide quantitative evidence to understand how different types and combinations of qualifications are used by young people to gain access to higher education institutions (universities and colleges of higher education).

Specifically, the research focused on the following issues:

a) Investigating if students' characteristics (*e.g.* prior educational institution, socio-economic status) were linked to different educational pathways and gave access to different types of institutions and subjects.

b) Understanding the range of qualifications and combinations of qualifications held by learners aged 16–19 who progressed to different types of higher education institutions (*e.g.* mission groups) and to different subjects.

c) Identifying the higher education destinations (both institutions and subjects) of learners holding different types of mainstream qualifications and of learners with a mixed economy of qualifications.

Given that A Levels are the dominant route to university study, a particular aim of this study was to understand the relationship between subject choice and attainment at A Level and higher education destinations.

Methodology

The data used was an extract of the HESA student records covering all full-time, first year undergraduates aged 17–19, domiciled in England, studying at UK universities in the 2011/12 academic year (250175 students). The data consisted of the university subject and the HE mission group of the institution where each student was studying, along with information on prior qualifications and socio-demographic characteristics. Considering data on undergraduates enabled us to focus on university participation in terms of institution attended and subject chosen, conditional on being enrolled at university.

The issues listed above were addressed in the first instance through descriptive analyses. Multilevel logistic regression was also used to give an assessment of the university groups

and courses in which students with particular prior qualifications were over or under represented, while controlling for other factors such as gender, prior educational institution and socio-economic status.

In order to analyse the effect of A Level subject choice and attainment, students with at least three A Levels (72% of students in the dataset) were assigned one of seven categories based on their subject choices. This was used to carry out further descriptive analysis and multilevel logistic regression focusing on these students, for whom A Levels were the passport to higher education. The focus on a single qualification allowed levels of attainment to be included in the modelling.

Findings

Students' characteristics

- The level of socio-economic deprivation of the area of residence and the type of prior institution students had attended were linked to the qualifications they had taken at level 3. This underlined the need to control for such factors in our regression models.
- More female than male students had followed academic and mixed programmes of study prior to entry to higher education, while male students were more likely to have taken vocational qualifications.
- Students from areas with high deprivation were more likely to hold vocational qualifications, while their counterparts in areas of low deprivation were more likely to have at least one A Level.
- The popularity of qualifications varied by the type of prior institution attended by students, with BTEC Diplomas and OCR National Extended Diplomas predominantly taken by students who had studied at FE colleges, while IB students had studied mainly in independent and selective schools.

Progression to HE with different prior qualifications

- Students with more academic backgrounds were more likely to go to universities in the Russell and 1994 groups while those holding vocational qualifications were more likely to study in other types of universities (*e.g.* universities in the University Alliance or in the Million+ Group). Students with a mixture of qualifications prior to entry at university were less likely to study in a Russell Group or 1994 Group university than those who held only academic qualifications.
- AS and A Levels were the most popular qualifications held by undergraduates at higher education institutions. 86% of the students starting in 2011/12 held these qualifications, but the proportion with only A Levels was 28%.
- The highest percentages of students with A Levels, and other academic qualifications such as Pre-U, IB, Asset Languages or Free Standing Maths, were found in universities of the Russell Group or 1994 Group. Holding an Extended Project or Pre-U GPR qualification alongside AS/A Levels significantly increased the probability of a student attending a university in the Russell or 1994 Groups, whereas having an OCR National or a BTEC alongside A Levels increased the likelihood of attending universities in the Million+ Group and in the University Alliance.
- There was considerable variation across university subject areas in the proportion of students with A Levels. The highest percentages were in subject areas related to languages, 'Historical and Philosophical Studies', 'Medicine and Dentistry' and 'Physical

Sciences'. Students holding Pre-U (principal subject) qualifications or an IB diploma were also more likely to study languages, 'Historical and Philosophical Studies', 'Linguistics, Classics and related subjects' and 'Social Studies', but less likely than average to study science subjects, with the exception of 'Medicine and Dentistry'.

- Holding an Extended Project qualification alongside A Levels increased the probability of studying 'Medicine and Dentistry', 'European Languages, Literature and related subjects', 'Historical and Philosophical studies', 'Linguistics, Classics and related subjects', 'Law', 'Physical Sciences' and 'Veterinary Sciences, Agriculture and related subjects'.
- BTECs were the second most popular qualification held by undergraduates at HE institutions. The highest percentages of students with BTEC qualifications were in universities of the Million+ Group and the University Alliance, while the lowest were in universities of the Russell Group. Students with other vocational qualifications (such as OCR Nationals and Double AS/A Levels) were also more likely to attend University Alliance or Million+ institutions.
- The most popular university subject areas for students with level 3 vocational qualifications (such as BTECs and OCR Nationals) were closely aligned to the subject of the prior qualification, and the strength of the association was greater for qualifications with more weight. Accordingly students with BTECs were more likely to have opted for 'Creative Arts and Design' and 'Biological Sciences', and much less likely to study 'Historical and Philosophical Studies', 'Linguistics, Classics and related subjects', 'Medicine and Dentistry', 'Physical Sciences' and 'Social Studies'. Students with OCR Nationals were more likely to have also taken A Levels in combination, so were not as different from those taking A Levels regarding their subject choice at university.
- The favoured subject areas by students following a mixed pathway to higher education were also popular among students with BTECs and OCR Nationals only, so when a student had a combination of academic and vocational qualifications the latter might have been driving the choice of subject at university.
- Students with academic qualifications were most likely to study at first degree level, while those with vocational qualifications were more likely to enrol on foundation degrees or HND/HNC courses.
- Students with Pre-U and IB qualifications were more likely than average to study a joint honours course at university, whereas students with the more vocational qualifications, particularly BTEC Diplomas, were more likely to study a single subject.

Progression to HE with A Levels only

- A Level subject choice had a significant effect not only on the subject area of study but on the institution studied at. The strongest link between A Level subject choice and university subject area was in 'Medicine and Dentistry', where students had overwhelmingly specialised in science (or multiple areas including science) at A Level. However, university subject areas on the vocational/academic divide, for example 'Architecture, Building and Planning', attracted students from a variety of backgrounds.
- Specialising in sciences or multiple areas greatly increased the likelihood of studying in a Russell Group university. However, students specialising in applied and expressive A Level subjects were less likely to attend a Russell Group university, but more likely to study in a University Alliance or Million+ institution.
- Attainment at A Level, as measured by both average grade and grades in specific subject areas, had a significant effect on the subject area of study. The greatest effect of overall grade was observed for 'Medicine and Dentistry' and 'Linguistics, Classics and

related subjects'. Sensitivity to grades in specific subject areas was most marked in 'Medicine and Dentistry' (with respect to A Levels in science subjects) and 'European Languages, Literature and related subjects' (with respect to language A Levels).

- Students with an average grade of C or above were much more likely to enrol in a Russell Group or 1994 Group university than students with a lower grade, and those with an average of A or above were even more likely to study at a Russell Group university. Conversely, high attaining A Level students were least likely to attend Million+ institutions.

Further research

This work is a snapshot of the distribution of prior qualifications in higher education in one academic year, 2011/12. However, recent and forthcoming changes in education and assessment, particularly relating to reform of level 3 qualifications and the introduction of higher university tuition fees, could potentially change some of our findings. Consequently, further research is recommended in a few years' time to review trends over time on the prior learning of undergraduates in UK higher education institutions.

1. Introduction

In a climate of significant reform in education it is crucial to better understand how level 3 qualifications, both academic and vocational, are used by young people to reach their goals, in particular, to progress to higher education and employment.

Students applying to study a course in a higher education institution have to make two choices: what subject to study and at which institution. These decisions are influenced by a range of different factors, for example their personal interests, their socio-economic background and, particularly, their prior qualifications and performance. Hoelscher *et al*. (2008) showed that the latter, that is, the educational background of the students, is the one with the highest influence. This clearly makes sense as some qualifications (and, in some cases, specific subjects) are a necessary condition for studying a course in a specific higher education institution.

In the last few years, there has been a growing body of research on how different educational pathways lead to different kinds of institutions and different subjects. This body of research included themes such as the status of non-traditional qualifications, the transition from vocational education and training to higher education, and the imbalance of different types of qualifications across higher education institutions and courses.

The status of non-traditional qualifications

Connor *et al.* (2006) found that there was a lack of parity of esteem between vocational and academic qualifications, leading to prejudice against and negative valuing of vocational qualifications. Some applicants with vocational qualifications perceived themselves to be excluded from applying to high status higher education institutions because of a lack of recognition of the value of their qualifications. The research by Connor *et al.* (2006) also highlighted a need for more knowledge on the content and assessment of vocational qualifications among higher education admissions staff.

Carter (2009) reported that universities tend to favour applicants with academic qualifications as opposed to those with vocational qualifications. Furthermore, she pointed out that there was inconsistent information available to prospective applicants to higher education courses regarding the acceptance of vocational qualifications, even for vocational orientated programmes. In particular, there was lack of clarity in the presentation of course entry requirements and there were difficulties for vocational applicants in working out how their qualifications would be treated in the admissions process and what grades would be required. This might influence or restrict university and/or subject choice and prevent individuals following vocational learning programmes from fulfilling their potential.

On the same lines, Sinclair and Connor (2008) and Hodgson and Spours (2010) suggested that the potential of vocational qualifications to become a major route to higher education was constrained by their low uptake and the low understanding and recognition of the qualifications.

Finally, the fact that a smaller proportion of students taking vocational qualifications at level 3 progress to higher education in comparison to those taking academic qualifications is sometimes cited as evidence that there is prejudice against vocational qualifications (*e.g.* Vickers and Bekhradnia, 2007).

The transition from vocational education and training to higher education

The government's commitment to widening participation in higher education has encouraged the growth of more and different pathways to HE study. In fact, in recent years, the numbers of applicants holding a mix of qualifications (academic and vocational) has increased, this mainly being due to a rise in the uptake of vocational qualifications (Hayward and Hoelscher, 2011). It is not surprising then that vocational progression has been the subject of considerable research and commentary recently.

Hayward and Hoelscher (2011), who carried out a very comprehensive study on access to higher education for students with vocational backgrounds, showed that these students were at a disadvantage compared with those progressing through academic pathways in terms of the higher education institution and subjects they gain access to. Prior to their work, Schwartz (2004) and Hoelscher *et al*. (2008) had shown that students with non-traditional qualifications typically progressed to post-1992 institutions and colleges of higher education, whilst students with academic qualifications, such as A Levels, were more likely to study at pre-1992 universities[1].

Connor and Little (2005) reported similar findings, that is, progression to level 4 learning programmes was much more likely via the academic route than via the vocational route. In particular, their work showed that 90% of those gaining two or more A Levels by the age of 18 were likely to be in higher education by age 21. The comparable percentage for those with a level 3 vocational qualification was much lower, estimated at just 40-50%.

Regarding the subject of study at higher education, Faithorn (2005), Purcell *et al.* (2008) and Hoelscher *et al*. (2008), among others, showed that there was much higher representation of vocational students in applied subject areas like computer science, business and administration studies and creative arts and design than in others, in particular, in some of the humanities (*e.g.* history), languages or medicine and dentistry.

The imbalance of different types of qualifications across higher education institutions and courses

A more scarce research literature can be found regarding the transition to higher education of learners with specific academic or vocational qualifications, for example, A Levels, International Baccalaureate (IB), Pre-U qualifications, Cambridge Nationals, BTECs, applied A Levels, extended project qualifications and those with a mixed economy of qualifications. Problems with the availability of matched datasets including the prior educational background of students and their higher education destinations (institutions and subjects) might be one of the main reasons for the absence of much research in this area.

HESA (2011) reported on the enrolment patterns at the different types of higher education institutions and on the chosen fields of study of students with an International Baccalaureate (IB) diploma. As expected, IB students were more likely to be enrolled in high ranked institutions than entrants holding other qualifications (A Levels or equivalents). Furthermore, this study showed that the most popular subject areas studied by IB students were business and administrative studies and social studies and that IB students were more likely to study medicine and dentistry than A Level students.

[1] The 1992 Further and Higher Education Act ended the divide between universities and polytechnics in the UK. The former are known as pre-1992 higher education institutions; the polytechnics and those more recently obtaining degree-awarding powers, such as colleges of higher education, are termed post-1992 higher education institutions (Hayward and Hoelscher, 2011).

Other research showed that applied A/AS Levels were considerably rarer at Russell Group universities than at other universities (Connor *et al.,* 2006) and that rates of acceptance of students holding BTECs was low in high ranked institutions (UCAS, 2012). Regarding subject of study, students holding BTEC qualifications usually enrolled on courses in the same subject area of their BTEC qualifications, for example courses related to creative arts and design, biological sciences, engineering or technologies (HEFCE, 2007). Similarly, applicants with a progression or advanced diploma were likely to study a course within the same subject area (Haynes and Richardson, 2011) and therefore they were over-represented in higher education courses relating to IT, creative arts and media, engineering or health and development.

Finally, students holding A Levels were more likely to study at high status universities even when controlling for subject and were usually over-represented in courses in the areas of humanities, sciences, medicine, mathematics and languages (Connor and Little, 2005; Connor *et al.*, 2006; Hoelscher *et al*. 2008).

Despite the evidence briefly summarised above, more research is yet needed to fully understand how different types of qualifications and combinations of qualifications channel learners in particular directions.

In 2012 UCAS undertook a Qualifications Information Review[2] to understand what needs higher education providers, schools, colleges and learners have for information about qualifications to enable fair, transparent and efficient admissions to higher education. Among the recommendations of the review was the production of qualification information profiles and of an annual report on the use of qualifications within HE admissions. Furthermore, UCAS will be publishing guidance and good practice for higher education institutions who wish to move to using qualifications and grades for the setting of entry requirements and offer making.

The main aim of this work was, therefore, to understand how different types and combinations of qualifications are used by young people to open access to higher education institutions (universities and colleges of higher education). The study prioritised undergraduates in their first year and considered only the 2011/12 academic year.

Specifically, the research focused on the following issues:

a) Investigating if students' characteristics (*e.g.* prior educational institution, socio-economic status) were linked to different educational pathways and gave access to different types of institutions and subjects.

b) Understanding the range of qualifications and combinations of qualifications held by learners aged 16–19 who progressed to different types of higher education institutions (*e.g.* mission groups) and to different subjects.

   This included learners with A Levels, IB or Pre U qualifications, OCR Nationals[3], BTECs, applied A Levels, extended project qualifications, but also learners with other level 3 qualifications.

   Generally, analyses were carried out at the prior qualification level but, where possible, the subject of the prior qualification was taken into account.

[2] http://www.ucas.ac.uk/reviews/qireview/

[3] OCR Nationals are now known as Cambridge Nationals.

It should be noted that, to date, some work has been carried out at a subject level to understand which subjects studied at 16–19 facilitate progression to higher education courses (*e.g.* Vidal Rodeiro, 2012; Russell Group, 2012; Vidal Rodeiro and Sutch, 2013).

c) Identifying the higher education destinations (both institutions and subjects) of learners holding different types of mainstream qualifications and of learners with a mixed economy of qualifications.

A Levels are seen as the traditional passport to higher education and are, in fact, taken by the vast majority of applicants to higher education courses. For example, Connor *et al*. (2006) quote that for the 2004 entry the vast majority of young applicants, almost 81%, had A or AS Levels and that 59% of them had A and AS Levels only.

So far, other works have addressed the issue of the progression to higher education of A Level students focusing on the effect of socio-economic status (*e.g.* Gayle *et al*., 2002; Chowdry *et al*., 2013), vocational qualifications (*e.g.* Hoelscher *et al*. 2008) or school background (*e.g.* Sutton Trust, 2009). Although controlling for these determinants, the last part of this work looks into the relationship between subject choice and attainment at A Level and university participation in terms of type of HE institution attended and course studied.

2. Data and methods

2.1 Data

The data for the analyses carried out in this report was provided by the Higher Education Statistics Agency (HESA)[4].

The HESA student record dataset contains detailed information on individual higher education (HE) students which is collected on an annual basis. The dataset includes information on the student's qualifications prior to starting the course, the course studied and the institution where the student was enrolled. HE students, for the purpose of HESA's data collection, are those students on courses for which the level of instruction is above that of level 3 of the National Qualifications Framework.

The data used in this research covers all full-time, first year undergraduates aged 17–19, domiciled in England, studying at UK universities in 2011/12 and includes, in particular:

Student level information

- Gender
- LSOA[5] of student's home address prior to entry
- Previous institution identifier
- Subject of higher education course
- Subject percentage
- Level of study
- Higher education mission group[6]

Prior qualification level information (multiple entries per student)

- Type of qualification
- Subject of qualification
- Grade in the qualification

For each student, information on up to three subjects of study, identified using the JACS[7] system, and the subject percentage (*i.e.* the relative contribution of that subject to the university degree) were provided. The subject percentages can take any value between 0 and 100, with the sum of all totalling 100. These percentages indicate the proportion of time allocated to each subject studied on a course and allow classifying higher education degrees as follows:

[4] **Source: HESA Student Record 2011/12. Copyright Higher Education Statistics Agency Limited 2012. HESA cannot accept responsibility for any inferences or conclusions derived from the data by third parties**.

[5] A LSOA (lower layer super output area) is a conglomeration of a number of census output areas (each output area has about 150 households). They usually have a minimum population size of 1000 and an average of 1500. There are over 34000 LSOAs in England.

[6] Due to confidentiality issues, data at the level of individual higher education institution was not provided and mission group was offered instead.

[7] The Joint Academic Classification of Subjects (JACS) system is used by the Higher Education Statistics Agency and the Universities and Colleges Admissions Service to identify the subject matter of programmes of study, especially for undergraduate degrees.

- *Singl*e: this includes all courses where only one subject is studied;
- *Balanced*: this includes all courses where two subjects are studied and both percentages are 50%;
- *Major/minor*: this covers all courses with two subjects where the percentage for one subject is greater than the percentage for the other;
- *Triple*: this includes all course with three subjects studied, with any combination of percentages.

The subject of study was then aggregated into 20 broad subject areas. For example, a student accepted to study for a degree in mathematics would be classified in the subject 'Mathematics' and the subject area 'Mathematical and Computer Science'. Similarly, a student accepted to study statistics would be classified in the subject 'Statistics' and the subject area 'Mathematical and Computer Science'. The majority of the analyses presented in this report were carried out at the subject area level. Appendix A lists the subject areas used in this research and the 10 most popular subjects that each of them comprise.

It should be noted that the subject area relates to the principal subject of study. For degrees with more than one subject (*e.g.* balanced combinations or triple honours) the subject area corresponds to the subject with the largest percentage. If a student took a balanced combination or a triple honours degree in three different subject areas, then the subject area was 'Combined'.

The levels of study considered in this research are: first degree, foundation degree, Higher National Diploma (HND), Higher National Certificate (HNC), and other undergraduate degree.

The higher education institutions are considered in mission groups through which they share ideas and resources regarding issues and procedures in the higher education sector. The groups considered are: The Russell Group, The 1994 Group, University Alliance and The Million+ Group. Appendix B shows a description of each group and provides a list of its members. It should be noted that some universities are not members of any of the groups above, or are affiliated to other groups (for example, GuildHE) and are therefore classified as Other.

The prior qualification level fields identify the type of qualification, subject and grade obtained prior to entry. In this research, the following mainstream prior qualifications were considered:

- A Level
  - Single
  - Double
- AS Level
  - Single
  - Double
- Asset languages
- BTEC
  - Award (equivalent to one A Level)
  - Certificate (equivalent to two A Levels)
  - Diploma (equivalent to three A Levels)
- Extended project
- Free standing mathematics
- Functional skills
- Key skills
- International Baccalaureate (full diploma)

- OCR National[8]
    - Certificate (equivalent to one A Level)
    - Diploma (equivalent to two A Levels)
    - Extended Diploma (equivalent to three A Levels)
- Diploma (advanced, progression, principal learning)
- Pre-U
    - Principal subject
    - Short course
    - GPR (Global Perspectives and Research)

Where candidates re-sat an examination, only the highest grade was kept and only qualifications that were graded with at least a pass were kept in the data.

Information on the awarding body for each student's qualifications was not available (although many of the qualifications considered are only offered by one awarding body).

It should be noted that the data obtained from HESA required considerable cleaning to make it suitable for the investigations carried out in this project. Details of the actions taken to clean the data in preparation for analysis are reported in Appendix C.

Other sources of data

Information about the type of the previous institution was obtained from the National Pupil Database (NPD)[9] and matched to the HESA data using the previous institution identifier. The following centre types were considered:

- Comprehensive schools
- Academies
- Independent schools
- Selective schools
- Sixth form colleges
- Further education (FE) colleges
- Other / unknown

A proxy for the students' socio-economic background was determined by the students' level of deprivation using the income deprivation affecting children index (IDACI) [10]. This index, obtained from the Office for National Statistics (http://www.neighbourhood.statistics.gov.uk/), shows the percentage of children in the LSOA in which the student resides who live in families that are income deprived. This deprivation variable was continuous and was subsequently divided into three equal-sized groups (low, average, high) using percentile values, with students being classified accordingly.

Caveats of the data

1. The data on prior learning provides information about the qualifications achieved by students who entered a course at higher education but not about the qualifications actually required by the HE institution.

[8] Now known as Cambridge Nationals.

[9] The National Pupil Database, compiled by the Department for Education, is a longitudinal database for all children in schools in England, linking student characteristics to school and college learning aims and attainment. The NPD holds pupil and school characteristics such as age, gender, ethnicity, level of deprivation, attendance and exclusions, matched to pupil level attainment data (Key Stage 2 to Key Stage 5 assessments and other external examinations).

[10] See page 19 of http://www.communities.gov.uk/documents/communities/pdf/733520.pdf for a detailed explanation of this index.

2. The awarding bodies have given their consent, via the Joint Council for Qualifications (JCQ), for some of the results data that they forward to UCAS to be shared with HE institutions and to be used when preparing the Student Record datasets. Therefore, it is UCAS who provides the majority of the prior qualifications data to HESA[11]. This means that prior qualification data on applicants who did not apply via UCAS might not be available. In fact, Hayward and Hoelscher (2011) report that the UCAS data is not representative of all entry to higher education. In particular, it typically covers only full-time students as it excludes direct entry which part-time students tend to use. This means that some qualification types might be underrepresented in the data.
3. Prior qualification data is obtained by UCAS through the awarding body linkage (ABL) process but this has the following limitations (Selected Qualifications Held data release, July 2012: Technical notes). Firstly, a qualification type held by an accepted applicant may not have been part of the ABL arrangements when the applicant was accepted; and secondly, results available through ABL arrangements cover a variety, but often limited, number of examination sittings depending upon the qualification and awarding body concerned – in many instances results are restricted to the most recent summer sittings.
4. The data used in this research did not provide any information about the clearing process, that is, whether a student was accepted for a course in clearing or in the main application round. Requirements could be less stringent in clearing and there may be less of a relationship with prior learning.

2.2 Methodology

The analyses presented in this report were carried out in four stages.

Stage 1 looked at the characteristics of university students (*e.g.* gender, prior educational institution, socio-economic status) with each prior qualification and investigated if these characteristics were linked to different educational pathways and giving access to different types of HE institutions and subjects.

Stage 2 identified the most popular mainstream qualifications, and combinations of those, that give access to different types of HE institutions and subjects.

Stage 3 examined the distribution of mainstream qualifications, and combinations of those, over HE institutions and subjects.

Finally, and due to the fact that A Levels are the main gateway to university, *Stage 4* focussed on A Level students and investigated their distribution over HE institutions and subject taking into account their specialism and performance prior to university entry.

In order to look at students with a mixed economy of qualifications students were classified, following work by Hoelscher *et al.* (2008), as pursuing one of the three following programmes of study:

- General academic
  Students obtained one or more of the following qualifications: AS/A Level, IB, Pre-U, Asset Languages, Extended Project, Free Standing Mathematics.

[11] Details of this 'transaction' are available at http://www.ucas.com/he_staff/hesareturn/ucasdata/.

- Vocational
  Students obtained one or more of the following qualifications: BTEC, Functional Skills, Key Skills, AS/A Level Double Award, OCR National.
- Mixed
  Students obtained a Diploma (Progression or Advanced) or a combination of general academic and vocational qualifications.

In order to investigate the distribution of A Level students over HE institutions and subject lines/areas, the dataset was restricted to students with at least three A Levels (excluding general studies[12]) and students were assigned, based on a categorisation of A Level subjects by Bramley (2012), to a 'specialism' as follows: *applied*, *expressive*, *humanities*, *languages*, *STEM* [13], *none* or *multiple*. More details about this classification can be found in Appendix D.

Analysis techniques

The issues considered in each of the four stages listed above were addressed, in the first instance, through descriptive analyses (tables and graphs, as appropriate).

An assessment of the universities or courses in which the different prior qualifications, programmes of study and type of A Level students are over or under represented (Stages 3 and 4) can also be made using odds ratios derived from multilevel logistic regressions. The regression analyses differ from the descriptive analyses because they take into account students' background characteristics (*e.g.* gender, prior educational institution and socio-economic status) when looking at the probability of attending specific university or pursuing a specific course.

Logistic regression is a type of regression analysis that is used when the dependent variable or outcome is a dichotomous variable (*i.e.* it takes only two values, which usually represent the occurrence or non-occurrence of some event) and the independent variables are continuous, categorical, or both. It is used to predict the probability that the event of interest will occur as a function of the independent variables (see, for example, Hosmer and Lemeshow, 2000).

A multilevel model was proposed due to the hierarchical or clustered structure of the data (as students were grouped within schools). If we failed to recognise this hierarchical structure, then the standard errors of the regression coefficients would be underestimated, leading to an overstatement of the statistical significance. Detailed discussions of the implementation and outcomes of the multilevel logistic regression can be found in Goldstein (2011).

For the purpose of the analyses presented in this report, the dependent variables for the models were the enrolment in a university or pursuing a course in a subject area.

Generally, the models considered in this report take the following form:

$$\log\left(\frac{p_{ij}}{1-p_{ij}}\right) = \beta_0 + \beta_1 IV1_{ij} + \beta_2 IV2_{ij} + \cdots + \beta_k IVk_{ij} + u_j$$

where p_{ij} is the probability of student i in prior institution j attending a university (or studying a course in a subject area), $IV1$ to IVk are the independent variables, β_0 to β_k are the

[12] General Studies has been considered separately from other A Levels in previous research and many universities do not include it in their offers.

[13] Science, Technology, Engineering and Mathematics.

regression coefficients and u_j is a random variable at prior institution level which followed a normal distribution with mean zero.

The multilevel logistic regression analyses were carried out using the procedure GLIMMIX in SAS (Version 9.2).

In the main body of this report, odds ratios for the independent variables are presented and discussed. Odds ratios were presented rather than coefficient estimates as they are easier to interpret.

An odds ratio represents the factor of increase in the odds of attending a university (or studying a subject) when the value of a categorical independent variable changes from the baseline to a specified category or when the value of a continuous independent variable increases by a specified unit. The actual magnitude of the odds ratios is difficult to interpret (see Osborne (2006) for an extended discussion); however, the relative magnitude of the odds ratios can be very informative. An odds ratio greater than 1 indicates an increase in the likelihood of attending a university (or studying a subject), with a greater odds ratio indicating a greater likelihood. Conversely, an odds ratio less than 1 indicates a decrease in the likelihood of attending a university (or studying a subject), with a smaller odds ratio indicating a smaller likelihood. And, finally, an odds ratio equal to 1 indicates an equal likelihood of attending a university (or studying a subject). These relative interpretations of the odds ratios are used to inform brief discussions of the effect of prior qualifications on the outcome variables.

A detailed breakdown of the dependent and independent variables included in the multilevel logistic models is presented in Sections 3.4 and 4.2.

3. Results: progression to HE from different educational pathways

3.1 University accepted applicants and their characteristics

This section of the report provides a brief description of the sample of students considered in the analyses carried out in this research.

The sample consisted of 250175[14] full-time, first year undergraduates, aged 17–19, domiciled in England and who started a course in a higher education institution in the 2011/12 academic year.

Table 3.1 below, which presents some background characteristics of the above students, highlights that the majority of them (around 54%) were female. Table 3.1 also displays the distribution of the deprivation level of the students and the type of their prior institution. Students living in areas of high and average deprivation prior to enrolment at university were overrepresented at university with respect to those from low deprived areas. Furthermore, the majority of students considered here had attended a comprehensive school (around 36%), with relatively high percentages attending a sixth form (more than 17%) or a further education college (almost 20%). Students from selective and independent centres were around 20% of the university students in the sample. Less than 7000 students (around 3%) enrolled at university in the 2011/12 academic year had previously attended an academy.

Table 3.1: Background characteristics of students considered in the analyses

Students' characteristics		***Number of students***	***Percentage of students***
Gender	Male	115460	46.2
	Female	134710	53.9
Level of deprivation*	Low	76810	30.7
	Average	89590	35.8
	High	83600	33.4
Prior centre type	Academy	6895	2.8
	Comprehensive	90835	36.3
	Independent	29510	11.8
	Selective	20160	8.1
	Sixth Form College	42945	17.2
	FE College	49105	19.6
	Other / unknown	10725	4.3
Total		250175	100

* For 170 students the level of deprivation was missing.

[14] Numbers of students have been rounded to the nearest multiple of 5 throughout the report, following HESA's rounding strategy.

The HESA data used in this research did not include the specific university attended by each student, but the mission group that the university belongs to. Table 3.2, which presents the percentages of students in each of the mission groups, shows that the 1994 Group was the one with fewer students, around 6%, followed by the Million + Group, with 17%. Half of the first year undergraduate students in 2011/12 were in Russell Group and University Alliance institutions. From Table 3.2 it is also easy to see that female students were slightly under-represented in Russell Group, University Alliance and 1994 Group universities in favour of their male peers, compared to the overall balance (see Table 3.1).

It is far more interesting to look at the breakdown between the mission group and the level of deprivation shown in Table 3.3. More specifically, considering three different levels of deprivation (low, average, high), it is easy to see an association between these two dimensions. Students in Million+ Group institutions are, in general more deprived than in other university groups. On the contrary, students in the Russell Group are, in general, less deprived. Students seemed to be almost equally distributed in the other mission groups.

Table 3.2: Percentages of students of each gender, by university mission group

University mission group	***Gender***		***Percentage of all students***
	Male	***Female***	
Russell Group	47.3	52.7	25.0
1994 Group	48.5	51.5	6.1
University Alliance	48.0	52.0	27.6
Million+	44.9	55.1	17.0
Other	43.1	56.9	24.3

Table 3.3: Percentages of students with each level of deprivation, by university mission group

University mission group	***Level of deprivation***		
	Low	***Average***	***High***
Russell Group	40.8	36.9	22.2
1994 Group	33.2	38.2	28.6
University Alliance	28.9	36.2	34.9
Million+	21.7	31.1	47.2
Other	28.1	37.0	34.9

An interesting picture is also depicted by Table 3.4, which shows the breakdown of students in different universities by the centre type of the institution prior to their enrolment at university. Again, there seems to be a relationship between these two dimensions. Among students enrolled in a Russell Group university, the proportions of those who had attended an independent or selective school were 28% and 15%, respectively. Considering that students from these two centre types formed a minority of undergraduates (as shown in Table 3.1), we can conclude that the probability to enrol in this HE mission group was higher for students of these two centre types. Table 3.4 also shows that further education and tertiary colleges were under-represented among Russell Group universities, and over-represented in Million+ Group universities.

Table 3.4: Percentages of students attending each prior institution type, by university mission group

University mission group	*Prior centre type*						
	Academy	*Comprehensive*	*Independent*	*Selective*	*Sixth Form College*	*FE College*	*Other*
Russell Group	2.5	31.6	27.8	14.9	15.0	6.3	1.9
1994 Group	2.5	38.4	13.0	11.8	17.2	13.4	3.6
University Alliance	3.0	39.1	6.0	5.1	18.7	24.5	3.6
Million+	3.3	37.9	3.3	3.5	17.8	28.6	5.6
Other	2.5	36.3	7.5	6.7	17.2	23.1	6.8

In terms of HE destination of students, another interesting variable available in HESA data is the university subject area that undergraduates have chosen. As shown in Table 3.5, 'Biological Sciences', 'Business and Administrative Studies' and 'Creative Arts and Design' were among the most popular subject areas chosen by English students in 2011/12. On the other side, courses related to foreign languages and cultures, 'Medicine and Dentistry', 'Veterinary Sciences, Agriculture and related subjects', 'Technologies' and 'Architecture, Building and Planning' were less frequent among university students.

Table 3.5: Percentages of students of each gender, by university subject area

University subject area	*Gender*		*Percentage of all students*
	Male	*Female*	
Architecture, Building and Planning	69.1	30.9	1.7
Biological Sciences	42.7	57.4	11.7
Business and Administrative studies	53.7	46.3	10.8
Creative Arts and Design	35.3	64.7	11.3
Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects	41.0	59.0	0.3
Education	15.3	84.7	3.3
Engineering	87.8	12.2	4.8
European Languages, Literature and related subjects	28.6	71.4	1.5
Historical and Philosophical studies	48.4	51.6	4.4
Law	35.6	64.4	3.9
Linguistics, Classics and related subjects	27.5	72.5	4.0
Mass Communications and Documentation	45.4	54.6	3.3
Mathematical and Computer Sciences	76.2	23.9	6.2
Medicine and Dentistry	45.7	54.3	1.9
Other/Combined	42.5	57.5	9.2
Physical Sciences	62.4	37.7	5.3
Social studies	45.0	55.0	8.4
Subjects allied to Medicine	22.4	77.7	6.1
Technologies	74.8	25.2	0.7
Veterinary Sciences, Agriculture and related subjects	30.0	70.1	1.2

Table 3.5 also shows the breakdown of students' gender by university subject area. It is interesting to notice gender differences in the choice of subject. Humanities (linguistics, classics, languages, education and related subjects) were far more popular among female students, together with 'Veterinary Sciences, Agriculture and related subjects', 'Subjects allied to Medicine' and 'Creative Arts and Design'. 'Architecture, Building and Planning', 'Engineering', 'Technologies' and 'Mathematics and Computer Sciences' were instead among the preferred courses of male students.

It is also interesting to look at the relationship between the university subject area and the level of deprivation. The picture depicted by Table 3.6 clearly suggests that students coming from high deprived areas, so from low socio-economic backgrounds, were more likely to study subjects such as 'Business and Administrative Studies, 'Law' and 'Mathematics and Computer Science', which would allow them an immediate return in the labour market. This also holds for 'Subjects allied to Medicine' (which prepare students to become nurses, physiotherapists and other paramedic roles) chosen by almost 40% of students from high deprived areas. This picture was completely the opposite when considering 'Medicine and Dentistry', since 41% of students came from low deprived areas (proxy for high socio-economic backgrounds). For these students also 'Historical and Philosophical Studies' and languages seemed to be more common than for students residing in disadvantaged areas.

Table 3.6: Percentages of students of each level of deprivation, by university subject area

University subject area	***Level of deprivation***		
	Low	***Average***	***High***
Architecture, Building and Planning	32.5	35.5	32.0
Biological Sciences	29.2	36.8	34.0
Business and Administrative studies	29.1	32.7	38.2
Creative Arts and Design	29.5	38.5	32.0
Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects	37.5	36.6	25.9
Education	29.1	37.4	33.6
Engineering	32.1	34.6	33.3
European Languages, Literature and related subjects	39.9	38.9	21.2
Historical and Philosophical studies	36.9	38.2	24.9
Law	25.2	32.1	42.7
Linguistics, Classics and related subjects	34.2	36.9	28.9
Mass Communications and Documentation	27.8	36.6	35.7
Mathematical and Computer Sciences	25.8	32.5	41.8
Medicine and Dentistry	41.0	34.8	24.3
Other/Combined	32.1	35.9	32.1
Physical Sciences	36.3	38.6	25.1
Social studies	32.0	34.7	33.3
Subjects allied to Medicine	26.5	34.1	39.4
Technologies	31.2	38.6	30.2
Veterinary Sciences, Agriculture and related subjects	33.4	46.8	19.8

The relationship between the choice of the university subject area and the prior centre type was not clear but, bearing in mind the distribution of students across prior institution types shown in Table 3.1, Table 3.7 reveals some patterns. As an example, 'Law' seemed to be a common choice among students who had attended a sixth form college (24.7%), while 'Creative Arts and Design', 'Technologies' and 'Veterinary Sciences, Agriculture and related

subjects' seem to be more frequent among students who attended further education colleges (44.3%, 31.5% and 27.8% respectively).

Most notably, Table 3.7 also shows that 'Medicine and Dentistry' was a common choice among students from selective and independent schools, but not a frequent choice for students in comprehensive centres. Among students from independent schools, 'Historical and Philosophical studies' and languages were more frequent than for other students. Among students from selective schools, 'Creative Arts and Design', 'Education' and 'Mass Communication and Documentation' were under-represented subjects.

Considering the whole picture presented so far, it is worth noting some clear relationships between university participation, in terms of HE mission group and university subject area, and the students' characteristics considered here. More specifically, there is some evidence that in order to interpret the association between university participation and the prior qualifications attained, there is a need to control for other confounding factors which turn out to be interconnected, such as the prior centre type and the level of deprivation, to be considered as proxy measures of the social, cultural and economic family background of students.

Table 3.7: Percentages of students in each institution type, by university subject area

University subject area	***Prior centre type***						
	Academy	***Comprehensive***	***Independent***	***Selective***	***Sixth Form College***	***FE College***	***Other***
Architecture, Building and Planning	2.3	32.9	14.2	7.8	14.8	22.8	5.2
Biological Sciences	2.9	39.0	9.5	8.1	18.2	18.4	3.9
Business and Administrative studies	3.2	37.5	10.3	5.8	18.7	20.2	4.4
Creative Arts and Design	1.9	25.9	5.9	3.3	12.9	44.3	5.9
Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects	3.5	38.0	23.8	11.6	14.6	7.2	1.4
Education	2.9	43.4	3.9	4.7	19.2	22.1	3.8
Engineering	2.9	36.6	13.8	9.7	14.5	16.4	6.0
European Languages, Literature and related subjects	2.1	32.6	29.6	13.8	15.5	4.8	1.7
Historical and Philosophical studies	2.6	38.0	22.4	10.8	15.9	7.6	2.7
Law	3.1	34.7	8.7	9.0	24.7	15.8	4.0
Linguistics, Classics and related subjects	2.4	38.9	17.5	9.6	18.0	10.2	3.4
Mass Communications and Documentation	2.7	38.4	4.4	4.4	20.0	26.2	4.0
Mathematical and Computer Sciences	3.4	39.0	5.9	6.9	17.3	21.7	5.7
Medicine and Dentistry	3.0	24.4	31.5	23.2	12.7	3.0	2.3
Other/Combined	3.0	38.8	14.7	8.9	16.6	13.8	4.2
Physical Sciences	2.8	42.6	14.1	11.3	17.3	9.6	2.4
Social studies	2.6	36.2	16.9	9.3	17.4	13.6	4.1
Subjects allied to Medicine	3.0	36.8	7.5	8.7	19.7	19.5	4.8
Technologies	2.1	31.8	9.1	5.8	15.4	31.5	4.4
Veterinary Sciences, Agriculture and related subjects	1.6	31.6	14.1	9.3	11.1	27.8	4.6

3.2 Popularity of mainstream qualifications

This section of the report focuses on which mainstream qualifications, generally at level 3, are most commonly held by undergraduates in different types of higher education institutions and courses. Section 3.2.1 discusses individual prior qualifications and Section 3.2.2 discusses combinations of those qualifications.

3.2.1 Popularity of individual prior qualifications

Table 3.8 shows the numbers and percentages of students who were enrolled in a UK university with the different prior qualifications considered in this research.

As expected, the most popular mainstream qualifications held by undergraduates at higher education institutions were A and AS Levels, with around 86% of the first year undergraduates having at least one A Level. BTECs, with 14% of the first year undergraduates having at least one qualification of this type (award, certificate or diploma), were the second most popular qualification, followed by the Extended Project (6.5%). Around 2% of the first year undergraduates had OCR Nationals (certificate, diploma or extended diploma) or Double Awards at A Level. Other academic qualifications such as the IB or the Pre-U were held by less than 1% of the first year undergraduates.

It should be noted that the percentages in Table 3.8 add to more than 100% because students can hold more than one type of prior qualification. Indeed, Table 3.9, which shows the percentage of students with different combinations of just two qualifications, highlights that:

- Just over 28% of students entering higher education with A Levels had only A Levels. A further 66% of those entering with A Levels had one or more AS Levels. The next most common qualification also held by those with A Levels was the Extended Project (7%).
- OCR Nationals were taken more in combination with other qualifications (*e.g.* A and AS Levels) than BTECs.
- Key Skills level 3/4 were predominantly taken in combination with A and AS Levels (in contrast with Functional Skills and Key Skills at level 2, which were more typically taken with BTECs).

  It should be noted that A and AS Levels in some subjects are proxy qualifications for Key Skills at level 3, meaning that they assess the same knowledge and skills as some aspects of the Key Skill qualifications. Because of this overlap, candidates can claim exemption from all or part of a Key Skill assessment[15]. This might be partly the reason for the high percentages of students with AS/A Levels and Key Skills level 3/4.
- A very high percentage of students with Pre-U qualifications had at least one A Level. Only 8% of the students who obtained Pre-U principal subject qualifications had no other types of qualification.

[15] See, for example:

- http://www.teachfind.com/qcda/key-skills-proxy-qualifications-qcda
- http://archive.teachfind.com/qcda/www.qcda.gov.uk/resources/assets/Proxy_exemptions_for_key_skills_-_qualification_list.pdf

Interestingly, only 12% of the students with a Pre-U GPR qualification obtained a Pre-U qualification in a principal subject.

- The qualification most frequently taken in isolation was the IB (92% of the IB students had no other qualification). This was followed by the BTEC Diploma and the OCR National Extended Diploma, which are equivalent to three A Levels, and were taken in isolation by 73 and 71% of the students, respectively.

Table 3.8: Numbers and percentages of students with each mainstream prior qualification

Prior qualification		***Number of students[16]***	***Percentage[17]***
A Level[18]		214230	85.6
A Level (Double)		3480	1.4
AS Level[19]		145430	58.1
AS Level (Double)		160	0.1
A+AS Level combined		70	0.0
Advanced Diploma		585	0.2
Asset Languages		25	0.0
BTEC	All types	35195	14.1
	Award	7005	2.8
	Certificate	6115	2.4
	Diploma	24015	9.6
Extended Project		16080	6.4
Free Standing Maths		595	0.2
Functional Skills Level 2		2995	1.2
IB		2270	0.9
Key Skill Level 2		6215	2.5
Key Skill Level 3/4		4905	2.0
OCR National	All types	3780	1.5
	Certificate	2600	1.0
	Diploma	1090	0.4
	Extended Diploma	305	0.1
Pre-U GPR		165	0.1
Pre-U Principal Subject		815	0.3
Pre-U Short Course		15	0.0
Principal Learning		710	0.3
Progression Diploma		65	0.0

[16] As previously, numbers of students have been rounded to the nearest multiple of 5, following HESA's rounding strategy.

[17] Percentages add to more than 100%, as students can hold multiple qualifications.

[18] Includes applied (single) A Levels.

[19] Includes applied (single) AS Levels.

Table 3.9: Combinations of prior qualifications ~ for row *i* and column *j*, percentage of students with qualification *i* that also have qualification *j* (the shaded diagonal cells show the percentage of students with qualification *i* that have no other qualification types)

	A Level	AS Level	IB	Pre-U GPR	Pre-U Principal Subject	Pre-U Short Course	Asset Languages	Extended Project	Free Standing Maths	Advanced Diploma	Progression Diploma	Principal Learning	A Level (Double)	AS Level (Double)	A+AS Level combined	BTEC Award	BTEC Certificate	BTEC Diploma	Functional Skills Level 2	Key Skill Level 2	Key Skill Level 3/4	OCR National Certificate	OCR National Diploma	OCR National Extended Diploma
A Level	28.1	65.8	0.0	0.1	0.3	0.0	0.0	7.1	0.3	0.1	0.0	0.1	1.3	0.1	0.0	2.0	1.2	0.5	0.3	1.0	2.0	0.9	0.3	0.0
AS Level	96.9	1.0	0.0	0.1	0.3	0.0	0.0	8.1	0.3	0.1	0.0	0.1	1.0	0.0	0.0	1.5	1.1	1.1	0.3	1.0	2.2	0.8	0.3	0.0
IB	3.3	3.1	92.3	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	1.0	0.1	0.0	0.0
Pre-U GPR	100.0	63.8	0.0	0.0	12.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Pre-U Principal Subject	90.4	48.0	0.0	2.5	7.6	1.2	0.0	4.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pre-U Short Course[20]	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'
Asset Languages	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'
Extended Project	94.3	73.3	0.0	0.0	0.2	0.0	0.0	0.8	0.3	3.0	0.4	3.9	1.0	0.0	0.0	2.2	0.9	1.3	2.6	0.9	3.1	0.8	0.3	0.1
Free Standing Maths	91.9	74.7	1.2	0.0	0.5	0.0	0.0	8.9	0.7	0.2	0.0	0.2	0.7	0.0	0.0	2.0	1.0	6.2	1.2	2.4	6.7	0.7	0.5	0.0
Advanced Diploma	48.0	19.6	0.0	0.0	0.0	0.0	0.0	82.9	0.2	1.5	0.0	86.5	0.5	0.0	0.0	19.1	1.5	1.2	44.7	1.5	1.4	2.9	0.3	0.0
Progression Diploma	29.2	41.5	0.0	0.0	0.0	0.0	0.0	87.7	0.0	0.0	3.1	95.4	0.0	0.0	0.0	7.7	3.1	0.0	52.3	0.0	1.5	0.0	0.0	0.0
Principal Learning	44.0	23.2	0.0	0.0	0.0	0.0	0.0	88.6	0.1	71.2	8.7	0.4	0.0	0.0	0.0	17.8	2.1	0.7	52.1	0.7	1.5	2.4	0.3	0.0
A Level (Double)	78.9	43.6	0.0	0.0	0.0	0.0	0.0	4.6	0.1	0.1	0.0	0.0	7.7	0.2	0.1	3.4	0.6	0.7	0.7	3.1	2.1	1.6	0.3	0.0
AS Level (Double)	67.3	42.6	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	3.7	6.2	0.0	9.3	3.7	9.3	1.2	4.9	2.5	1.9	0.0	0.0
A+AS Level combined	88.2	41.2	0.0	0.0	0.0	0.0	0.0	4.4	0.0	0.0	0.0	0.0	4.4	0.0	1.5	5.9	2.9	1.5	0.0	1.5	5.9	1.5	0.0	0.0
BTEC Award	68.2	35.5	0.0	0.0	0.0	0.0	0.0	5.8	0.2	1.8	0.1	2.1	1.9	0.2	0.1	11.4	9.7	4.9	2.5	2.3	1.4	3.8	1.3	0.1
BTEC Certificate	42.6	25.8	0.0	0.0	0.0	0.0	0.0	2.5	0.1	0.2	0.0	0.3	0.4	0.1	0.0	10.0	33.3	1.0	2.8	4.5	1.4	2.2	0.4	0.0
BTEC Diploma	4.8	6.9	0.0	0.0	0.0	0.0	0.0	0.9	0.2	0.0	0.0	0.0	0.1	0.1	0.0	1.2	0.2	73.3	4.9	10.2	1.9	0.4	0.1	0.0
Functional Skills Level 2	22.4	15.5	0.1	0.0	0.0	0.0	0.0	14.0	0.2	8.7	1.1	12.4	0.8	0.1	0.0	5.1	5.5	39.5	20.8	12.4	3.6	0.8	0.5	0.4
Key Skill Level 2	34.5	23.8	0.0	0.0	0.0	0.0	0.0	2.4	0.2	0.1	0.0	0.1	1.8	0.1	0.0	2.3	4.3	39.3	6.0	18.8	5.8	0.4	0.5	0.4
Key Skill Level 3/4	85.9	65.9	0.5	0.0	0.0	0.0	0.0	10.2	0.8	0.2	0.0	0.2	1.5	0.1	0.1	1.7	1.7	9.2	2.2	7.4	2.3	0.7	0.3	0.1
OCR National Certificate	79.2	45.2	0.1	0.0	0.0	0.0	0.0	5.3	0.2	0.7	0.0	0.7	2.3	0.1	0.0	9.6	5.4	3.6	0.9	1.1	1.4	4.0	2.6	0.1
OCR National Diploma	54.1	34.2	0.0	0.0	0.0	0.0	0.0	4.8	0.3	0.2	0.0	0.2	1.0	0.0	0.0	7.5	2.0	2.9	1.4	2.8	1.2	6.0	19.8	0.0
OCR National Extended Diploma	8.2	7.8	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	3.6	7.8	1.0	0.7	0.0	71.2

[20] Percentages calculated on groups which contain 52 or fewer individuals were suppressed and represented as '..', following HESA's rounding strategy.

Table 3.10 shows the percentages of students who enrolled in a UK university with the different prior qualifications by the university mission group their HE institution is affiliated with.

As expected, the highest percentages of students with A/AS Levels were in universities of the Russell Group, where around 96% of the first year undergraduates had at least one A Level and 72% at least one AS Level. The second highest percentages were in universities in the 1994 Group (approximately 92% and 68% of their first year undergraduates had A and AS Levels, respectively). The lowest percentages of students with A/AS Levels were in universities of the Million+ Group (75% and 44% of their first year undergraduates had A and AS Levels, respectively). Other academic qualifications such as Pre-U, the Extended Project and the IB were more popular in the Russell Group universities than in any other group of universities.

The highest percentages of students with BTECs, OCR Nationals and Double Award A Levels were in universities of Million+ Group followed by universities in the University Alliance. As expected, the lowest percentages of students with this type of qualifications were in the universities of the Russell Group. In particular, 23% and 20% of first year undergraduates in the Million+ Group and University Alliance universities had BTEC qualifications whilst only 6% did so in universities of the 1994 Group and 1% in universities of the Russell Group.

Table 3.10: Percentages of students with each mainstream prior qualification, by university mission group

Prior qualification		*University mission group*				
		Russell Group	***1994 Group***	***University Alliance***	***Million +***	***Other***
A Level		96.1	92.4	83.0	75.2	83.5
A Level (Double)		0.2	0.6	1.8	2.5	1.5
AS Level		71.9	67.5	55.5	43.8	54.6
AS Level (Double)		0.0	0.0	0.1	0.1	0.1
A+AS Level combined		0.0	0.0	0.0	0.0	0.0
Advanced Diploma		0.0	0.1	0.4	0.4	0.2
Asset Languages		0.0	0.0	0.0	0.0	0.0
BTEC	All types	1.4	6.0	19.8	23.2	16.2
	Award	0.2	1.0	4.8	3.7	3.0
	Certificate	0.1	0.8	3.6	4.3	2.6
	Diploma	1.2	4.5	12.8	16.1	11.4
Extended Project		9.8	7.3	5.1	4.4	5.7
Free Standing Maths		0.4	0.1	0.3	0.1	0.2
Functional Skills Level 2		0.2	0.6	1.8	2.0	1.1
IB		2.1	1.6	0.3	0.2	0.7
Key Skill Level 2		0.7	1.2	3.3	3.8	2.7
Key Skill Level 3/4		1.7	1.8	2.4	2.0	1.8
OCR National	All types	0.3	0.5	2.4	2.5	1.4
	Certificate	0.2	0.4	1.6	1.7	0.9
	Diploma	0.1	0.1	0.7	0.7	0.4
	Extended Diploma	0.0	0.0	0.2	0.2	0.1
Pre-U GPR		0.1	0.2	0.0	0.0	0.1
Pre-U Principal Subject		0.9	0.3	0.1	0.0	0.1
Pre-U Short Course		0.0	0.0	0.0	0.0	0.0
Principal Learning		0.0	0.2	0.4	0.5	0.3
Progression Diploma		0.0	0.0	0.0	0.0	0.0

Table 3.11 shows the numbers and percentages of students who enrolled in a UK university with the different prior qualifications by the subject area they chose at university.

Not surprisingly, the highest percentages of students with A Levels were in subject areas related to languages, 'Historical and Philosophical Studies', 'Medicine and Dentistry' and 'Physical Sciences' whilst the highest percentages of students with applied qualifications (*e.g.* BTECs, OCR Nationals or Double Award A Levels) were in 'Business and Administrative Studies', 'Education', 'Creative Arts and Design', 'Mass Communications and Documentation' 'Mathematical and Computer Sciences', 'Technologies', 'Subjects allied to Medicine' and 'Veterinary Sciences, Agriculture and other related subjects'.

However, some of the subject areas in Table 3.11 comprised rather different types of university courses. For example, 'Mathematical and Computer Sciences' included courses such as Mathematics (a relatively theoretical/academic course) and Computer Science or Software Engineering (relatively practical/vocational courses). Similarly, 'Veterinary Science, Agriculture and related subjects' included courses such as Pre-clinical Veterinary Medicine (a course with very high entry requirements) and Forestry or Agricultural Sciences (courses where entry requirements are not so demanding)[21]. Therefore, this analysis was also carried out at the finer course subject level.

Table 3.12 shows the numbers and percentages of students who enrolled in a UK university with the most popular mainstream prior qualifications[22] (A Level, Double A Level, BTEC, Extended Project and OCR National) by course subject. This table shows that the highest percentages of students with A Levels were in the following subjects: 'Mathematics', 'Physics', 'English Studies', 'Chemistry' and 'Physical Geographical Sciences'. The highest percentages of students with applied qualifications (*e.g.* BTECs) were in the following subjects: 'Sports Science', 'Computer Science', 'Drama', 'Clothing/Fashion Design', 'Graphic Design' and 'Adult Nursing'.

It is worth noting that whilst Table 3.11 showed that around 80% of the students enrolled in a course in the degree subject area of 'Mathematical and Computer Sciences' had A Levels, Table 3.12 points out that around 99% of the students pursuing a degree in 'Mathematics' had A Levels and only 70% of those pursuing a degree in 'Computer Science' did so.

[21] Appendix A presents the subject areas used in this research and the 10 most popular course subjects that each of them comprise.

[22] Most popular qualifications as shown in Table 3.8.

Table 3.11: Percentages of students with each mainstream prior qualification, by subject area

Prior qualification		*University subject area*									
		Architecture, Building and Planning	***Biological Sciences***	***Business and Administrative Studies***	***Creative Arts and Design***	***Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects***	***Education***	***Engineering***	***European Languages, Literature and related subjects***	***Historical and Philosophical Studies***	***Law***
A Level		83.2	83.5	80.8	75.7	95.4	79.1	86.9	96.6	97.0	92.6
A Level (Double)		0.9	0.8	2.6	1.3	0.1	4.2	0.5	0.1	0.1	0.8
AS Level		54.5	59.4	52.8	41.5	66.1	50.2	62.4	71.4	69.8	64.3
AS Level (Double)		0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1
A+AS Level combined		0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Advanced Diploma		1.0	0.0	0.3	0.3	0.0	0.4	0.6	0.0	0.0	0.1
Asset Languages		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
BTEC	All types	16.2	16.8	20.6	24.5	1.4	21.3	12.0	0.8	1.3	7.6
	Award	4.1	2.6	4.8	3.8	0.4	4.5	1.9	0.5	0.8	2.5
	Certificate	2.1	3.1	5.7	2.4	0.0	3.6	1.8	0.2	0.2	1.6
	Diploma	11.2	11.9	11.5	19.2	1.0	14.6	8.9	0.2	0.4	4.1
Extended Project		6.0	6.4	4.2	3.9	7.2	5.1	5.6	8.4	9.9	9.1
Free Standing Maths		0.5	0.2	0.2	0.1	0.4	0.1	0.6	0.1	0.1	0.1
Functional Skills Level 2		2.6	1.1	1.5	1.6	0.0	1.9	1.8	0.1	0.2	0.6
IB		1.1	0.9	0.5	0.3	2.7	0.3	0.7	2.5	1.8	1.2
Key Skill Level 2		2.1	2.7	3.0	4.0	0.4	3.4	2.5	0.6	0.6	2.0
Key Skill Level 3/4		1.6	1.8	1.9	2.0	0.7	2.6	1.7	1.9	1.7	2.8
OCR National	All types	1.2	1.3	2.7	1.0	0.4	2.8	1.1	0.2	0.5	1.1
	Certificate	1.1	0.9	1.9	0.7	0.3	1.5	0.9	0.1	0.4	0.9
	Diploma	0.3	0.4	0.8	0.3	0.0	1.1	0.2	0.1	0.1	0.3
	Extended Diploma	0.0	0.1	0.2	0.1	0.1	0.3	0.0	0.0	0.0	0.0
Pre-U GPR		0.1	0.1	0.0	0.0	0.4	0.0	0.0	0.0	0.2	0.0
Pre-U Principal Subject		0.4	0.1	0.2	0.2	1.6	0.1	0.2	1.6	0.9	0.2
Pre-U Short Course		0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.2	0.0	0.0
Principal Learning		1.2	0.0	0.4	0.4	0.0	0.5	0.7	0.0	0.0	0.1
Progression Diploma		0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0

Table 3.11 (continued): Percentages of students with each mainstream prior qualification, by subject area

Prior qualification		*University subject area*									
		Linguistics, Classics and related subjects	***Mass Communications and Documentation***	***Mathematical and Computer Sciences***	***Medicine and Dentistry***	***Physical Sciences***	***Social Studies***	***Subjects allied to Medicine***	***Technologies***	***Veterinary Sciences, Agriculture and related subjects***	***Other Combined***
A Level		97.5	84.2	78.9	97.5	95.0	90.1	82.3	73.3	76.2	90.0
A Level (Double)		0.2	0.5	2.2	0.0	0.5	1.4	4.0	0.7	0.3	1.0
AS Level		67.4	52.5	54.8	70.7	70.0	62.7	58.4	47.8	52.0	61.8
AS Level (Double)		0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.1
A+AS Level combined		0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Diploma		0.0	0.5	0.4	0.0	0.0	0.2	0.4	0.4	0.1	0.1
Asset Languages		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BTEC	All types	1.6	17.4	21.2	0.1	4.0	8.6	15.2	27.8	22.7	10.0
	Award	0.8	4.0	4.4	0.1	1.1	2.1	2.4	5.4	2.5	2.5
	Certificate	0.4	2.0	3.9	0.0	0.8	1.6	2.3	3.0	2.1	2.1
	Diploma	0.5	12.5	14.5	0.0	2.4	5.4	11.1	20.4	18.5	6.2
Extended Project		10.3	5.7	5.4	13.8	7.7	6.7	5.9	3.8	7.7	7.0
Free Standing Maths		0.1	0.1	0.5	0.8	0.5	0.2	0.2	0.5	0.2	0.1
Functional Skills Level 2		0.2	1.6	2.1	0.0	0.5	0.9	1.8	2.0	2.3	0.8
IB		1.6	0.3	0.4	2.1	1.3	1.3	0.5	0.7	0.5	1.3
Key Skill Level 2		0.7	2.6	3.7	0.5	1.1	1.8	3.1	4.5	5.4	1.8
Key Skill Level 3/4		2.7	2.4	2.0	1.6	1.7	1.8	2.0	1.7	2.4	1.7
OCR National	All types	0.7	2.7	3.6	0.0	0.6	1.2	1.9	1.7	0.6	1.2
	Certificate	0.5	1.5	2.8	0.0	0.6	0.8	0.9	1.1	0.6	0.9
	Diploma	0.2	1.0	0.9	0.0	0.1	0.4	0.6	0.7	0.1	0.3
	Extended Diploma	0.0	0.3	0.2	0.0	0.0	0.1	0.4	0.0	0.0	0.1
Pre-U GPR		0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.1	0.0	0.1
Pre-U Principal Subject		0.8	0.1	0.2	0.5	0.3	0.5	0.1	0.1	0.1	0.5
Pre-U Short Course		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Principal Learning		0.0	0.6	0.4	0.0	0.0	0.3	0.5	0.5	0.1	0.2
Progression Diploma		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0

Table 3.12: Percentages of students with the most popular mainstream prior qualifications, by subject (top 40 subjects)[23]

University subject	*Prior qualification*				
	A Level	*A Level (Double)*	*BTEC*	*Extended Project*	*OCR National*
Psychology	94.5	1.0	5.6	8.2	1.0
Business studies	81.0	3.2	20.5	4.4	2.9
Sports science	61.9	0.7	41.6	2.6	2.9
English studies	97.7	0.1	1.7	9.7	0.6
Mathematics	99.0	0.3	1.1	6.1	0.7
History by period	97.1	0.1	1.1	10.6	0.5
Computer science	68.9	3.2	29.5	5.4	4.9
Economics	96.6	0.3	1.8	7.5	0.3
Sociology	90.7	1.4	9.8	5.5	1.2
Politics	96.9	0.1	1.8	9.4	0.4
Biology	92.0	1.0	6.7	7.6	0.3
Law by area	93.3	0.7	7.2	9.3	0.9
Law by topic	93.3	0.8	6.3	9.2	1.2
Media studies	86.2	0.7	16.3	5.2	2.9
Training teachers - primary	87.1	3.2	13.6	6.4	2.2
Management studies	82.4	2.7	16.5	4.7	2.6
Chemistry	97.5	0.2	1.2	6.7	0.4
Music	78.0	0.2	22.5	5.2	0.2
Drama	75.8	0.2	28.0	4.8	0.8
Physics	98.0	0.0	0.5	8.9	0.3
Adult nursing	66.8	8.0	26.5	4.6	3.9
Mechanical engineering	92.2	0.1	7.2	5.0	0.7
Design studies	75.9	1.7	22.7	3.2	1.5
Clothing/fashion design	71.9	2.1	27.5	2.9	0.6
Physical geographical sciences	97.5	0.3	1.3	8.5	0.8
Accounting	89.6	1.6	13.2	4.0	2.2
English literature	97.3	0.2	1.7	10.3	0.7
Fine art	82.3	2.4	18.4	3.0	0.7
Journalism	90.4	0.6	10.3	5.7	1.9
Human & social geography	96.6	0.1	0.6	8.3	0.7
Marketing	85.4	2.3	17.4	4.5	2.3
Pre-clinical medicine	97.4	0.0	0.0	14.3	0.0
Academic studies in education	79.9	5.2	20.0	4.7	3.0
Others in subjects allied to medicine	86.5	2.4	12.3	6.8	1.0
Graphic design	72.9	2.0	26.6	2.5	1.1
Architecture	90.0	0.6	8.9	7.4	0.8
Civil engineering	88.4	0.4	11.3	4.9	0.6
Finance	88.8	1.7	13.1	4.8	1.7
Clinical medicine	97.3	0.0	0.1	14.0	0.1
Pharmacy	97.0	0.3	2.7	5.7	0.6

[23] Data on all subjects is available on request.

Table 3.13, which shows the percentages of students who enrolled in a UK university with the different prior qualifications by type of degree course taken, highlights that the highest percentages of students with A/AS Levels, and other academic qualifications such as the Extended Project, Pre-U principal subject or the IB, were among those studying for first degrees and the lowest percentages among those doing so for foundation degrees or HND/HNC courses. This pattern reverses for the more vocational qualifications (*e.g.* BTECs, Double Award A Levels, OCR Nationals, Advanced Diplomas).

Table 3.14 presents the percentages of students with each mainstream qualification by the subject balance indicator of the higher education course they enrolled in: single or joint (balanced, major/minor, triple) honours. It shows that BTEC qualifications, particularly BTEC Diplomas, were more popular among students doing a single honours degree than among those doing a joint honours one. This is not totally unexpected since students with a BTEC Diploma (worth three A Levels) had specialised in a particular area. On the other hand, A Level qualifications, OCR Nationals, the IB, the Extended Project or the Pre-U were more popular among those doing joint honours degrees. This could be due to the fact that these qualifications have a broader focus or that students combined different subject areas at the sixth form and wanted to do the same in higher education.

Table 3.13: Percentages of students with each mainstream prior qualification, by type of degree course at university

Prior qualification		*Type of degree course*			
		First Degree	***Foundation degree***	***HND/HNC***	***Other undergraduate***
A Level		86.7	61.0	62.1	72.4
A Level (Double)		1.3	2.5	3.1	5.9
AS Level		59.1	34.9	37.5	49.9
AS Level (Double)		0.1	0.1	0.2	0.9
A+AS Level combined		0.0	0.0	0.1	0.0
Advanced Diploma		0.2	0.3	0.5	0.6
Asset Languages		0.0	0.0	0.1	0.0
BTEC	All types	13.3	32.1	31.8	17.2
	Award	2.7	5.1	7.5	5.9
	Certificate	2.2	6.4	10.6	3.9
	Diploma	9.2	21.8	15.5	9.2
Extended Project		6.6	2.9	2.4	4.2
Free Standing Maths		0.2	0.2	0.2	0.3
Functional Skills Level 2		1.1	3.2	3.2	2.4
IB		0.9	0.1	0.0	0.2
Key Skill Level 2		2.3	6.8	5.7	4.9
Key Skill Level 3/4		2.0	1.7	1.6	2.6
OCR National	All types	1.4	2.8	4.2	3.1
	Certificate	1.0	2.0	2.5	1.7
	Diploma	0.4	0.9	1.6	1.0
	Extended Diploma	0.1	0.1	0.4	0.4
Pre-U GPR		0.1	0.0	0.0	0.0
Pre-U Principal Subject		0.3	0.0	0.0	0.2
Pre-U Short Course		0.0	0.0	0.0	0.0
Principal Learning		0.3	0.6	0.6	0.6
Progression Diploma		0.0	0.1	0.2	0.1

Table 3.14: Percentages of students with each mainstream prior qualification, by subject balance

Prior qualification		***Subject balance indicator***			
		Single	***Balanced***	***Major/Minor***	***Triple***
A Level		84.7	89.7	90.0	89.9
A Level (Double)		1.5	1.0	0.9	0.9
AS Level		57.2	61.8	63.7	61.6
AS Level (Double)		0.1	0.1	0.0	0.1
A+AS Level combined		0.0	0.0	0.0	0.1
Advanced Diploma		0.2	0.2	0.1	0.1
Asset Languages		0.0	0.0	0.0	0.0
BTEC	All types	15.0	10.6	9.3	7.4
	Award	2.9	2.6	1.9	1.3
	Certificate	2.5	2.2	1.8	1.6
	Diploma	10.3	6.5	6.2	4.7
Extended Project		6.3	6.8	7.6	9.1
Free Standing Maths		0.2	0.2	0.6	0.4
Functional Skills Level 2		1.3	0.8	0.7	0.4
IB		0.8	1.2	1.0	2.4
Key Skill Level 2		2.6	1.9	2.4	1.3
Key Skill Level 3/4		2.0	1.9	2.1	1.3
OCR National	All types	1.6	1.3	1.0	6.3
	Certificate	1.1	0.9	0.8	0.5
	Diploma	0.5	0.4	0.3	0.2
	Extended Diploma	0.1	0.1	0.0	0.1
Pre-U GPR		0.1	0.1	0.0	0.1
Pre-U Principal Subject		0.3	0.5	0.3	0.9
Pre-U Short Course		0.0	0.0	0.0	0.0
Principal Learning		0.3	0.2	0.1	0.2
Progression Diploma		0.0	0.0	0.0	0.1

The results presented so far show that the majority of the academic qualifications are over-represented in certain types of institutions (*e.g.* universities in the Russell Group or in the 1994 Group) and under-represented in others (*e.g.* universities in the University Alliance or in the Million+ Group). One reason for this could be that the more applied and/or vocational university courses are over-represented in some types of institutions and more academic courses in others (see Figure 3.1). In particular, degrees in languages or medicine are mainly offered in Russell Group universities whilst degrees in business, communications or technologies are more commonly offered by universities in the University Alliance or the Million+ Group.

To take this into account, the subject area was considered together with the type of HE institution. Table 3.15 presents therefore the percentages of students with the most popular mainstream qualifications by university type and subject area. Some highlights from this table are:

- The percentages of students with a BTEC qualification pursuing a HE course in the area of 'Architecture, Building and Planning' (16%, as presented in Table 3.11) varied considerably by university group. For example, only 1% of the students pursuing a course in that subject area in a Russell Group university held a BTEC qualification, whilst over 16% of those in a University Alliance institution or 27% of those in a Million + Group university did so.

  This pattern was quite similar in other subject areas, particularly in 'Biological Sciences', 'Mass Communications and Documentation' or 'Mathematical and Computer Sciences'.

- The percentage of students with A Levels pursuing a HE course in the 'Creative Arts and Design' area was quite high in universities of the Russell Group (94%) compared to the percentages in universities of the University Alliance (76%) or Million+ Group (66%). The same pattern applied to the percentages of students with an Extended Project qualification pursuing a course in this area (8% of students had Extended Project in the Russell Group universities compared to around 4% in any other institution).

  This pattern was quite similar in other subject areas, particularly in the 'Veterinary Sciences, Agriculture and related subjects' or 'Technologies'.

- The percentages of students with OCR Nationals pursuing a course in 'Subjects Allied to Medicine' was higher in universities of the Million+ Group or the University Alliance (around 2.4% in both groups) than in universities of the Russell Group or the 1994 Group (below 1%). Similar patterns for the OCR Nationals were present in the 'Mathematical and Computer Sciences', the 'Business and Administrative Studies' or the 'Education' subject areas.

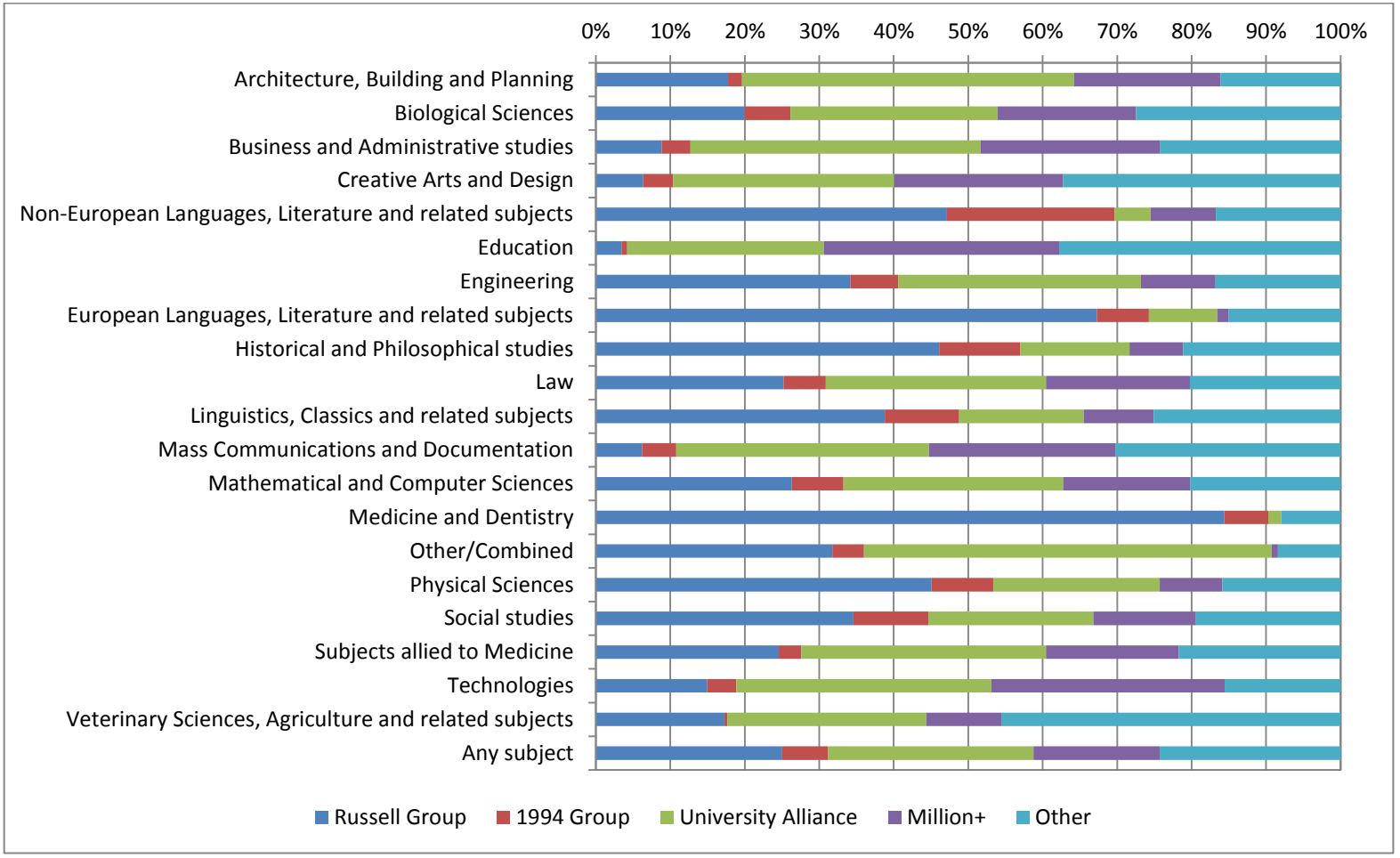


Figure 3.1: Percentages of students enrolled in each subject area in each university mission group

Table 3.15: Percentages of students with the most popular mainstream qualifications, by university mission group and subject area

Subject area	*University mission group*	*Prior qualification*				
		A Level	*A Level (Double)*	*BTEC*	*Extended Project*	*OCR National*
Architecture, Building and Planning	Russell Group	95.5	0.0	1.4	7.5	0.2
	1994 Group	73.8	0.0	17.9	3.6	0.0
	University Alliance	83.3	0.9	16.9	5.9	1.8
	Million+	74.3	1.7	27.4	4.0	1.3
	Other	83.9	1.0	13.2	8.0	0.7
Biological Sciences	Russell Group	96.5	0.1	1.6	9.5	0.1
	1994 Group	91.5	0.5	7.1	7.3	0.3
	University Alliance	82.9	0.9	20.2	6.0	1.8
	Million+	76.5	1.7	21.2	4.2	2.3
	Other	76.7	0.7	24.6	5.8	1.4
Business and Administrative Studies	Russell Group	93.1	1.1	4.5	4.5	0.8
	1994 Group	86.7	1.8	11.3	5.9	0.7
	University Alliance	83.0	2.6	21.3	4.4	3.1
	Million+	74.8	3.3	24.7	3.6	3.2
	Other	77.8	2.8	22.3	4.0	2.3
Creative Arts and Design	Russell Group	93.7	0.5	4.5	7.6	0.0
	1994 Group	80.3	0.9	19.8	3.7	0.3
	University Alliance	76.2	1.4	27.3	3.6	1.5
	Million+	65.9	1.6	32.0	3.9	1.4
	Other	77.8	1.3	21.5	3.6	0.7
Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects	Russell Group	96.5	0.0	0.5	7.2	0.3
	1994 Group	94.2	0.0	0.6	8.1	1.2
	University Alliance	'..'	'..'	'..'	'..'	'..'
	Million+	91.0	1.5	6.0	4.5	0.0
	Other	98.3	0.0	0.8	8.4	0.0
Education	Russell Group	79.2	0.4	17.6	4.2	0.7
	1994 Group	74.2	6.1	18.2	1.5	3.0
	University Alliance	79.8	3.9	23.3	5.0	3.2
	Million+	78.5	4.6	19.5	5.2	3.5
	Other	79.2	4.2	21.9	5.3	2.0
Engineering	Russell Group	96.1	0.0	2.1	6.7	0.3
	1994 Group	94.4	0.3	4.8	5.6	0.4
	University Alliance	80.1	0.7	20.1	5.1	1.9
	Million+	71.8	1.8	25.6	3.3	2.8
	Other	86.9	0.4	11.8	5.5	0.7
European Languages, Literature and related subjects	Russell Group	96.2	0.0	0.2	9.5	0.1
	1994 Group	98.5	0.0	0.7	7.4	0.4
	University Alliance	98.3	0.6	2.5	4.8	0.6
	Million+	91.1	0.0	5.4	1.8	3.6
	Other	96.8	0.0	2.1	6.9	0.2

Table 3.15 (continued): Percentages of students with the most popular mainstream qualifications, by university mission group and subject area

Subject area	*University mission group*	*Prior qualification*				
		A Level	*A Level (Double)*	*BTEC*	*Extended Project*	*OCR National*
Historical and Philosophical Studies	Russell Group	96.5	0.1	0.2	12.2	0.1
	1994 Group	96.0	0.1	0.7	9.8	0.2
	University Alliance	98.5	0.2	3.0	6.7	0.9
	Million+	97.9	0.3	3.1	5.4	1.4
	Other	97.4	0.3	2.2	8.6	0.7
Law	Russell Group	96.1	0.1	1.0	14.2	0.1
	1994 Group	93.6	0.0	2.8	11.5	0.4
	University Alliance	92.5	0.8	12.0	7.0	1.6
	Million+	87.7	1.8	11.3	5.9	2.1
	Other	92.6	0.7	7.0	8.1	0.9
Linguistics, Classics and related subjects	Russell Group	96.4	0.1	0.3	13.5	0.2
	1994 Group	98.1	0.1	0.2	10.2	0.0
	University Alliance	98.7	0.1	3.9	6.6	1.3
	Million+	97.9	0.6	3.2	7.7	1.3
	Other	98.0	0.2	1.8	8.8	1.0
Mass Communications and Documentation	Russell Group	96.7	0.3	2.1	8.8	0.6
	1994 Group	88.6	0.3	11.1	5.9	2.8
	University Alliance	87.0	0.6	17.4	6.2	3.1
	Million+	80.9	0.7	18.8	5.2	2.8
	Other	81.6	0.4	19.2	4.9	2.4
Mathematical and Computer Sciences	Russell Group	96.9	0.3	2.2	7.8	0.7
	1994 Group	89.8	1.6	10.4	5.4	1.2
	University Alliance	71.9	3.0	32.1	4.7	5.9
	Million+	61.0	3.2	32.9	4.0	4.8
	Other	79.1	2.6	21.9	4.9	3.5
Medicine and Dentistry	Russell Group	97.6	0.0	0.0	14.1	0.0
	1994 Group	98.2	0.0	0.0	11.2	0.0
	University Alliance	96.5	1.2	1.2	18.8	1.2
	Other	97.1	0.0	0.0	10.6	0.0
Physical Sciences	Russell Group	97.8	0.0	0.3	9.5	0.1
	1994 Group	96.7	0.6	2.0	7.6	0.1
	University Alliance	93.2	0.9	8.4	5.6	1.3
	Million+	81.3	1.6	16.9	4.8	2.0
	Other	95.4	0.4	3.5	6.9	0.7
Social Studies	Russell Group	95.9	0.1	0.9	9.3	0.2
	1994 Group	94.6	0.5	2.7	7.1	0.4
	University Alliance	87.2	2.4	14.7	4.5	2.3
	Million+	79.4	3.2	18.9	4.4	1.9
	Other	90.0	1.7	9.1	6.6	1.5

Table 3.15 (continued): Percentages of students with the most popular mainstream qualifications, by university mission group and subject area

Subject area	*University mission group*	*Prior qualification*				
		A Level	*A Level (Double)*	*BTEC*	*Extended Project*	*OCR National*
Subjects allied to Medicine	Russell Group	92.7	1.8	4.3	7.1	1.0
	1994 Group	91.6	2.9	8.4	5.0	0.4
	University Alliance	80.6	4.4	18.6	5.8	2.4
	Million+	73.5	5.0	22.9	4.5	2.4
	Other	80.4	4.8	15.8	6.3	1.9
Technologies	Russell Group	93.6	1.1	2.6	6.0	0.0
	1994 Group	97.3	0.0	0.0	5.5	0.0
	University Alliance	72.7	0.4	34.7	3.1	1.8
	Million+	61.7	0.7	39.5	3.7	2.8
	Other	71.6	0.9	20.4	2.2	0.9
Veterinary Sciences, Agriculture and related subjects	Russell Group	96.6	0.0	2.3	16.0	0.2
	1994 Group	'..'	'..'	'..'	'..'	'..'
	University Alliance	68.5	0.4	31.7	6.7	0.6
	Million+	59.6	0.0	40.7	3.0	0.7
	Other	76.7	0.4	21.1	6.2	0.8
Other/Combined	Russell Group	96.3	0.1	0.9	9.5	0.2
	1994 Group	95.1	0.2	4.1	8.3	0.5
	University Alliance	83.7	1.7	19.6	4.6	2.4
	Million+	80.1	2.5	21.0	4.9	2.1
	Other	91.4	0.9	8.8	6.7	1.2

3.2.2 Popularity of combinations of prior qualifications

As described in Section 2.2 and in order to look at a mixed economy of qualifications, students were classified as pursuing one of the three following programmes of study:

- General academic
- Vocational
- Mixed

Figure 3.2 below shows the percentages of students progressing to higher education through the different programmes of study. Although the percentages of university students following vocational and mixed programmes of study have been growing in the last few years (see, for example, Hayward and Hoelscher (2011)), the majority of the first year undergraduates in 2011/12 had followed an academic programme of study (80%). Approximately 11% of the first year undergraduates had followed a vocational programme and the remaining 10% a mixed one.

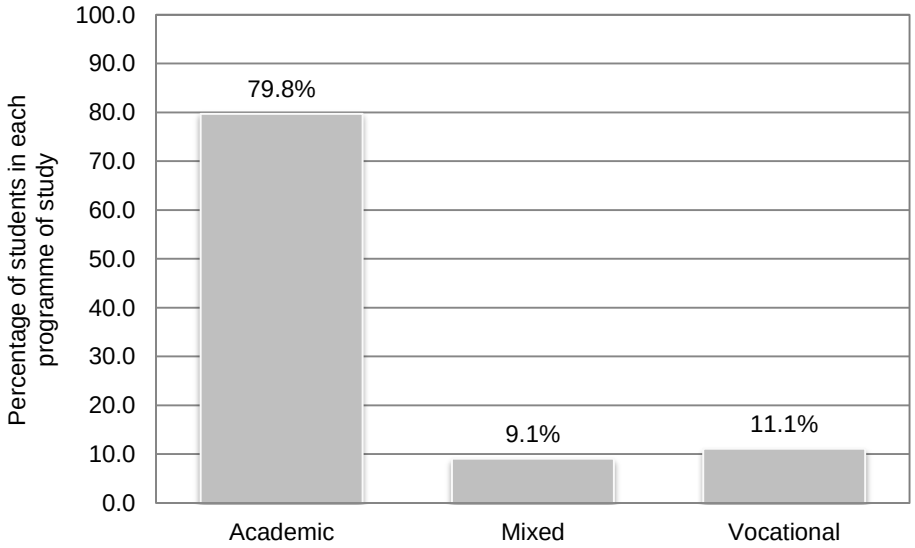


Figure 3.2: Percentages of students progressing to higher education through the different programmes of study

Figure 3.3 shows the percentages of students who progressed to higher education through the different programmes of study by the university mission group their HE institution is affiliated with. As expected, the highest percentages of students following an academic programme of study were in universities of the Russell Group (96%), followed closely by universities in the 1994 Group (90%). The lowest percentages of students following an academic programme were in universities of the Million+ Group (67%). Similarly, the highest percentages of students following a vocational programme of study were in universities of the Million+ Group (21%), followed by universities in the University Alliance (14%). Unsurprisingly, the lowest percentages of students following a vocational pathway into university were in the universities of the Russell Group (1%). It is worth noting that, in the Russell Group universities, the percentage of students following a mixed programme of study was higher than the percentage of students following a vocational one (3% vs. 1%).

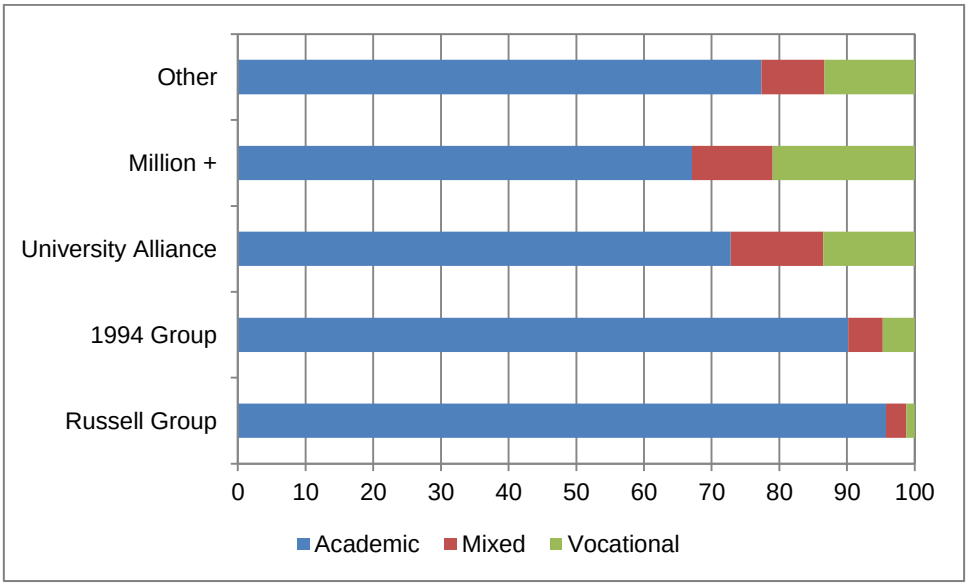


Figure 3.3: Percentages of students following each programme of study, by university mission group

Tables 3.16 and 3.17 show, respectively, the percentages of students who progressed to higher education through the different programmes of study by the subject area and course subject at university.

Similarly to the findings from Table 3.11, Table 3.16 shows that the highest percentages of students progressing from an academic programme of study were in subject areas related to languages, in 'Historical and Philosophical Studies', 'Medicine and Dentistry' and 'Physical Sciences'. On the contrary, the highest percentages of students progressing from a vocational programme of study were in 'Creative Arts and Design', 'Education', 'Technologies' and 'Veterinary Sciences, Agriculture and related sciences'.

Table 3.17 shows that the highest percentages of students progressing from academic programmes of study were in the following subjects: 'Pre-clinical Medicine', 'Physics', 'Clinical Medicine', and 'Human and Social Geography'. On the other hand, the highest percentages of students progressing from vocational or mixed programmes of study were in the following subjects: 'Sports Science', 'Computer Science', 'Adult Nursing' and 'Clothing/Fashion Design'.

It is worth noting, for example, that whilst Table 3.16 showed that around 71% of the students enrolled in a course in the area of 'Mathematical and Computer Sciences' progressed from an academic programme of study, Table 3.17 points out that around 95% of the students pursuing a degree in 'Mathematics' progressed from an academic programme and only 56% of those pursuing a degree in 'Computer Science' did so.

Table 3.16: Percentages of students following each programme of study, by subject area

University subject area	***Programme of study***		
	Academic	***Mixed***	***Vocational***
Architecture, Building and Planning	78.2	9.5	12.3
Biological Sciences	78.1	8.6	13.3
Business and Administrative Studies	71.0	13.8	15.2
Creative Arts and Design	68.8	10.9	20.2
Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects	97.0	2.1	0.9
Education	67.1	15.8	17.0
Engineering	82.9	7.1	10.0
European Languages, Literature and related subjects	96.4	3.5	0.1
Historical and Philosophical Studies	95.7	3.9	0.4
Law	86.0	9.3	4.7
Linguistics, Classics and related subjects	94.1	5.5	0.4
Mass Communications and Documentation	74.6	12.6	12.9
Mathematical and Computer Sciences	69.6	13.0	17.4
Medicine and Dentistry	97.8	2.2	0.0
Physical Sciences	92.4	4.7	2.9
Social Studies	85.6	7.5	6.9
Subjects allied to Medicine	75.0	11.2	13.8
Technologies	65.5	11.5	23.0
Veterinary Sciences, Agriculture and related subjects	73.6	5.3	21.1
Other/Combined	85.1	7.8	7.1

Table 3.17: Percentages of students following each programme of study, by subject (top 40 subjects)[24]

University subject	***Programme of study***		
	Academic	***Mixed***	***Vocational***
Psychology	89.1	7.5	3.4
Business studies	70.5	14.4	15.1
Sports science	52.5	14.4	33.2
English studies	94.4	5.3	0.4
Mathematics	95.4	4.4	0.2
History by period	95.5	4.3	0.2
Computer science	57.5	16.6	26.0
Economics	95.7	3.4	0.9
Sociology	83.6	9.1	7.3
Politics	94.9	4.2	0.9
Biology	89.4	5.6	5.0
Law by area	87.3	8.7	4.0
Law by topic	86.8	9.2	3.9
Media studies	75.6	12.9	11.5
Training teachers - primary	76.3	13.6	10.1
Management studies	75.4	11.8	12.8
Chemistry	96.1	3.3	0.6
Music	74.0	8.2	17.8
Drama	67.4	13.2	19.4
Physics	97.3	2.4	0.3
Adult nursing	56.2	17.8	25.9
Mechanical engineering	89.0	5.7	5.3
Design studies	68.9	10.5	20.6
Clothing/fashion design	65.0	10.9	24.1
Physical geographical sciences	95.5	3.8	0.7
Accounting	80.4	11.7	7.9
English literature	93.7	5.5	0.8
Fine art	75.9	10.3	13.8
Journalism	82.5	10.0	7.5
Human & social geography	96.3	3.6	0.1
Marketing	74.7	13.8	11.5
Pre-clinical medicine	98.7	1.3	0.0
Academic studies in education	67.2	17.0	15.8
Others in subjects allied to medicine	81.4	8.1	10.4
Graphic design	65.3	11.3	23.4
Architecture	87.3	7.3	5.4
Civil engineering	85.1	6.1	8.8
Finance	81.0	11.0	8.0
Clinical medicine	96.8	3.2	0.0
Pharmacy	93.9	4.1	1.9

[24] Data on all subjects is available on request.

In terms of type of degree studied at university, Figure 3.4 shows that the highest percentages of students following an academic programme of study were among those doing first degrees and the lowest among those doing foundation degrees and HNDs/HNCs. This pattern reverses for students following a vocational or mixed programme of study.

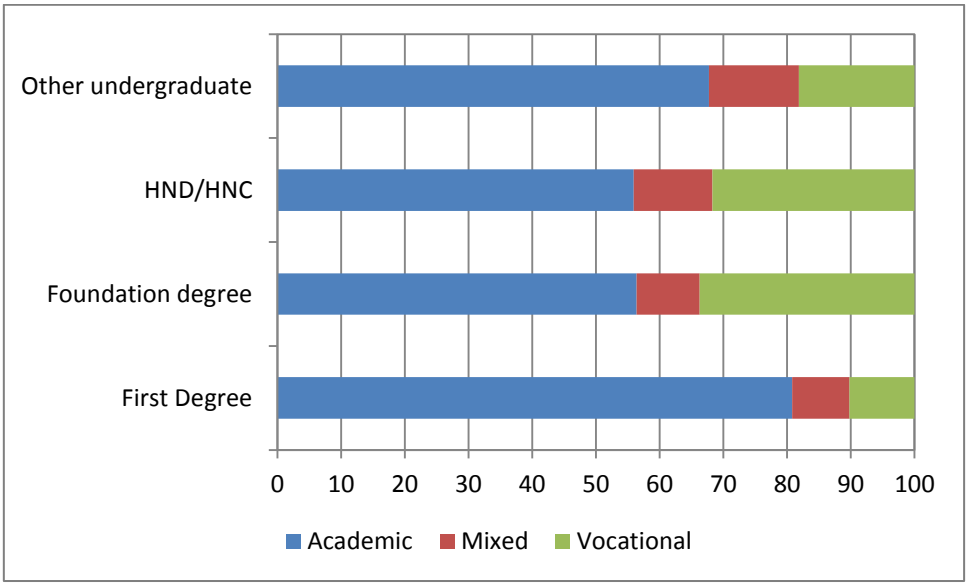


Figure 3.4: Percentages of students following each programme of study, by type of degree at university

Figure 3.5 presents the percentages of students following each programme of study by the subject balance indicator of the degree they enrolled in: single or joint (balanced, major/minor, triple) honours. It shows that academic programmes of study prior to entry at university were more popular among students doing a joint honours degree, particularly a triple honours degree, than among those doing a single honours one. On the other hand, vocational and mixed programmes of study were more popular among those doing single honours degrees.

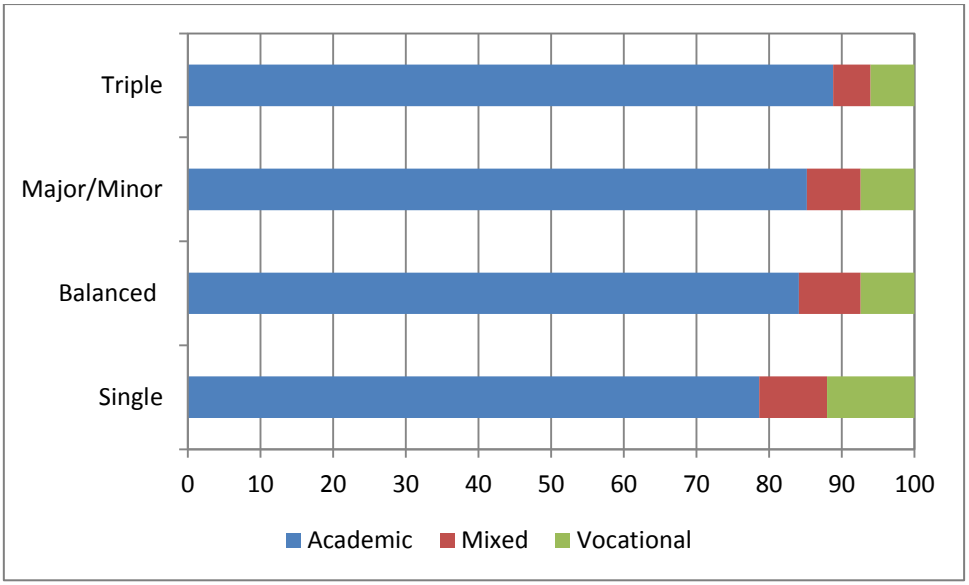


Figure 3.5: Percentages of students following each programme of study, by subject balance indicator

As before, Table 3.18 presents the percentages of students who followed each programme of study by university type and subject area. The results shown in this table are analogous to those for Table 3.15, with percentages of students within each subject varying by type of university.

Table 3.18: Percentages of students following each programme of study, by university mission group and subject area

Subject area	*University mission group*	*Programme of study*		
		Academic	*Mixed*	*Vocational*
Architecture, Building and Planning	Russell Group	95.5	3.0	1.4
	1994 Group	72.6	3.6	23.8
	University Alliance	76.6	11.3	12.1
	Million+	66.9	12.4	20.8
	Other	81.8	7.4	10.8
Biological Sciences	Russell Group	95.7	3.3	1.0
	1994 Group	90.2	4.0	5.8
	University Alliance	74.2	12.0	13.8
	Million+	70.5	9.4	20.1
	Other	70.2	9.9	19.9
Business and Administrative studies	Russell Group	91.0	5.0	4.0
	1994 Group	82.3	8.3	9.4
	University Alliance	70.7	16.5	12.8
	Million+	64.2	14.9	20.9
	Other	69.5	12.1	18.4
Creative Arts and Design	Russell Group	92.2	4.3	3.5
	1994 Group	75.2	8.2	16.6
	University Alliance	66.0	14.4	19.6
	Million+	59.3	11.3	29.4
	Other	72.2	9.4	18.4
Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects	Russell Group	98.4	1.6	0.0
	1994 Group	97.7	2.3	0.0
	University Alliance	'..'	'..'	'..'
	Million+	89.6	4.5	6.0
	Other	97.5	1.7	0.8
Education	Russell Group	77.5	3.5	19.0
	1994 Group	68.2	10.6	21.2
	University Alliance	65.4	18.2	16.5
	Million+	67.2	15.9	16.9
	Other	67.3	15.5	17.2
Engineering	Russell Group	95.3	2.4	2.3
	1994 Group	92.8	3.6	3.6
	University Alliance	72.4	12.5	15.1
	Million+	64.9	10.9	24.2
	Other	84.4	5.7	9.9
European Languages, Literature and related subjects	Russell Group	97.7	2.2	0.0
	1994 Group	95.2	4.8	0.0
	University Alliance	93.2	6.5	0.3
	Million+	83.9	10.7	5.4
	Other	94.4	5.6	0.0

Table 3.18 (continued): Percentages of students following each programme of study, by university mission group and subject area

Subject area	*University mission group*	*Programme of study*		
		Academic	*Mixed*	*Vocational*
Historical and Philosophical studies	Russell Group	97.8	2.1	0.1
	1994 Group	96.7	3.0	0.3
	University Alliance	92.3	6.7	0.9
	Million+	92.1	7.1	0.8
	Other	94.1	5.3	0.6
Law	Russell Group	95.5	3.8	0.7
	1994 Group	91.8	6.4	1.8
	University Alliance	81.0	13.2	5.7
	Million+	79.5	11.0	9.5
	Other	86.3	9.4	4.3
Linguistics, Classics and related subjects	Russell Group	96.7	3.2	0.1
	1994 Group	96.9	3.1	0.0
	University Alliance	90.3	9.2	0.6
	Million+	90.8	7.8	1.4
	Other	92.9	6.6	0.5
Mass Communications and Documentation	Russell Group	93.3	5.5	1.2
	1994 Group	83.3	8.3	8.3
	University Alliance	74.5	15.5	9.9
	Million+	71.7	11.7	16.6
	Other	73.6	11.3	15.1
Mathematical and Computer Sciences	Russell Group	94.2	4.1	1.7
	1994 Group	83.2	9.1	7.7
	University Alliance	56.8	20.4	22.8
	Million+	51.1	15.5	33.4
	Other	69.8	12.4	17.8
Medicine and Dentistry	Russell Group	97.8	2.2	0.0
	1994 Group	96.1	3.9	0.0
	University Alliance	94.1	3.5	2.4
	Other	99.0	1.0	0.0
Physical Sciences	Russell Group	97.3	2.5	0.2
	1994 Group	95.9	2.6	1.5
	University Alliance	86.6	8.9	4.5
	Million+	75.1	8.6	16.3
	Other	93.3	4.5	2.2
Social studies	Russell Group	97.0	2.2	0.7
	1994 Group	93.3	4.2	2.5
	University Alliance	76.7	13.2	10.1
	Million+	71.0	11.6	17.4
	Other	84.6	8.1	7.4

Table 3.18 (continued): Percentages of students following each programme of study, by university mission group and subject area

Subject area	*University mission group*	*Programme of study*		
		Academic	*Mixed*	*Vocational*
Subjects allied to Medicine	Russell Group	89.0	6.3	4.7
	1994 Group	86.2	7.7	6.1
	University Alliance	71.2	13.7	15.1
	Million+	64.5	13.4	22.1
	Other	73.7	11.0	15.3
Technologies	Russell Group	92.1	6.4	1.5
	1994 Group	100.0	0.0	0.0
	University Alliance	61.6	14.6	23.8
	Million+	50.0	14.6	35.4
	Other	71.1	5.8	23.1
Veterinary Sciences, Agriculture and related subjects	Russell Group	96.6	1.1	2.3
	1994 Group	'..'	'..'	'..'
	University Alliance	65.2	6.2	28.6
	Million+	55.9	6.7	37.4
	Other	73.6	6.2	20.2
Other/Combined	Russell Group	96.7	2.6	0.7
	1994 Group	93.0	4.7	2.3
	University Alliance	73.7	13.1	13.2
	Million+	71.3	12.4	16.3
	Other	85.5	8.3	6.2

3.3 Distribution of mainstream prior qualifications, and combinations of those, over HE institutions and subjects: descriptive analyses

This section of the report focuses on the most popular mainstream qualifications giving access to different types of higher education institutions and courses (subjects and subject areas). In contrast to Section 3.2, which considered the popularity/prevalence of certain prior qualifications among various groups of university students, this section presents results for each prior qualification, showing the destinations and subject of study of students holding that qualification.

It should be borne in mind that the percentages reported in this section are not a proportion of the whole cohort taking these qualifications, as students who did not progress to higher education are not included in the data. In addition, many students took a combination of qualifications (as discussed in Section 3.2), so they are implicitly included several times in these tables. Most notably, 97% of those taking AS Levels also took one or more A Levels; while many of the tables below show, perhaps surprisingly, that those with AS Levels went on to study more academic HE courses than those with A Levels, this is because one might expect students who studied four subjects at AS and took three at A2 to have attained more highly than those who studied three subjects only at AS and A2 (in which case the AS would not be recorded separately in the data).

Table 3.19 shows the types of degree course followed by students with each prior qualification. Students taking Pre-U, IB and Extended Project were most likely to study at first degree level, while students taking vocational qualifications were more likely than average to enrol on foundation degree or HND/HNC courses. Students with a progression diploma were particularly likely to go on to study at HND/HNC level. However, those students with Key Skill level 3/4 qualifications were more likely than students with other vocational qualifications to progress to a first degree; this is probably because these qualifications were frequently taken in combination with A/AS Levels.

Table 3.20 shows the university groups attended by students with each prior qualification. Generally, students taking academic qualifications were more likely to go to a Russell Group or 1994 Group university than those studying vocational qualifications, who were more likely to attend a University Alliance or Million+ institution. Students with IB and Pre-U qualifications were most likely to go to a Russell Group university, no doubt in part due to the types of schools offering these qualifications. A higher proportion of students with free-standing maths, asset languages and extended project qualifications went to a Russell Group university than those taking A Levels. Students with vocational qualifications such as BTECs, OCR Nationals, and Double (applied) A Levels were more likely than average to attend a University Alliance or Million+ institution.

Table 3.19: Types of degree course taken by students with each prior qualification (as a percentage of total students with each qualification progressing to HE)

Prior qualification		*Type of degree course*			
		First degree	*Foundation degree*	*HND/HNC*	*Other undergraduate*
A Level		96.6	2.2	0.6	0.6
A Level (Double)		89.7	5.5	1.7	3.0
A+AS Level combined		92.6	4.4	2.9	0.0
AS Level		97.0	1.9	0.5	0.6
AS Level (Double)		84.0	4.3	1.9	9.9
Advanced Diploma		92.5	4.1	1.7	1.7
Asset Languages		'..'	'..'	'..'	'..'
BTEC	All types	90.3	7.1	1.7	0.9
	Award	90.8	5.6	2.1	1.5
	Certificate	87.3	8.2	3.3	1.1
	Diploma	90.9	7.1	1.2	0.7
Extended Project		97.8	1.4	0.3	0.5
Free Standing Maths		96.3	2.2	0.7	0.8
Functional Skills Level 2		88.2	8.3	2.0	1.4
IB		99.6	0.2	0.0	0.1
Key Skill Level 2		88.3	8.5	1.7	1.4
Key Skill Level 3/4		95.7	2.8	0.6	1.0
OCR National	All types	90.6	5.8	2.1	1.5
	Certificate	91.3	5.8	1.7	1.2
	Diploma	88.8	6.7	2.8	1.7
	Extended Diploma	91.8	2.9	2.6	2.6
Pre-U GPR		99.4	0.6	0.0	0.0
Pre-U Principal Subject		99.3	0.4	0.0	0.4
Pre-U Short Course		'..'	'..'	'..'	'..'
Principal Learning		90.9	6.0	1.7	1.4
Progression Diploma		83.1	9.2	6.2	1.5
All students		95.4	3.1	0.8	0.7

Table 3.20: University mission groups attended by students with particular prior qualifications (as a percentage of total students with each qualification progressing to HE)

Prior qualification		*University mission group*				
		Russell Group	***1994 Group***	***University Alliance***	***Million+***	***Other***
A Level		28.1	6.6	26.8	14.9	23.7
A Level (Double)		4.3	2.8	36.1	30.1	26.8
A+AS Level combined		5.9	1.5	30.9	30.9	30.9
AS Level		31.0	7.1	26.4	12.8	22.8
AS Level (Double)		6.8	2.5	30.2	30.2	30.2
Advanced Diploma		2.6	3.1	45.1	26.8	22.5
Asset Languages		'..'	'..'	'..'	'..'	'..'
BTEC	All types	2.5	2.6	38.9	28.0	28.0
	Award	1.5	2.1	47.8	22.6	26.0
	Certificate	1.1	1.9	41.0	30.1	25.9
	Diploma	3.0	2.9	36.8	28.5	28.8
Extended Project		38.1	6.9	22.0	11.6	21.5
Free Standing Maths		38.1	2.4	32.5	10.1	16.9
Functional Skills Level 2		5.2	2.9	40.9	27.7	23.3
IB		56.8	10.9	9.9	3.8	18.7
Key Skill Level 2		7.5	3.1	36.4	26.3	26.8
Key Skill Level 3/4		21.2	5.5	33.9	17.1	22.4
OCR National	All types	4.2	1.9	43.6	27.7	22.7
	Certificate	4.5	2.1	43.6	27.6	22.1
	Diploma	3.3	1.1	42.8	28.8	24.0
	Extended Diploma	3.9	2.0	46.7	24.8	22.5
Pre-U GPR		43.6	14.1	15.3	6.7	20.2
Pre-U Principal Subject		72.7	6.4	8.4	2.3	10.2
Pre-U Short Course		'..'	'..'	'..'	'..'	'..'
Principal Learning		1.8	3.2	42.1	29.9	22.9
Progression Diploma		3.1	3.1	43.1	30.8	20.0
All students		25.0	6.1	27.6	17.0	24.3

Table 3.21 shows the distribution of the subject balance indicator for students with each prior qualification. The proportions are roughly similar for all qualification types, with single honours degrees dominating. However, students with Pre-U and IB qualifications had higher than average percentages of joint honours. For IB students, the broader focus of their sixth form study may have encouraged them to pursue more than one subject at degree level. The reasons for Pre-U students are less clear but this may be an artefact of the relative levels of uptake of Pre-U subjects (for example, languages). Students with the more vocational qualifications (BTEC, Double A Level, and OCR Nationals) were more likely than average to study a single subject at university.

Table 3.21: Subject balance of HE courses studied by students with particular prior qualifications (as a percentage of total students with each qualification progressing to HE)

Prior qualification		***Subject balance indicator***			
		Single	***Balanced***	***Major/minor***	***Triple***
A Level		80.5	14.1	3.9	1.5
A Level (Double)		87.0	9.8	2.3	0.9
A+AS Level combined		80.9	13.2	2.9	2.9
AS Level		80.1	14.3	4.0	1.5
AS Level (Double)		82.7	14.2	1.2	1.9
Advanced Diploma		86.5	11.3	1.7	0.5
Asset Languages		'..'	'..'	'..'	'..'
BTEC	All types	86.6	10.2	2.4	0.7
	Award	84.3	12.5	2.5	0.6
	Certificate	84.0	12.3	2.7	0.9
	Diploma	87.8	9.2	2.4	0.7
Extended Project		79.5	14.2	4.4	2.0
Free Standing Maths		79.6	8.9	8.9	2.5
Functional Skills Level 2		88.1	9.1	2.3	0.5
IB		74.7	17.4	4.2	3.7
Key Skill Level 2		85.2	10.5	3.5	0.8
Key Skill Level 3/4		82.1	13.0	4.0	0.9
OCR National	All types	85.0	11.8	2.5	0.6
	Certificate	84.2	12.4	2.8	0.6
	Diploma	85.1	11.8	2.3	0.7
	Extended Diploma	89.2	9.5	0.7	0.7
Pre-U GPR		77.3	19.0	2.5	1.2
Pre-U Principal Subject		72.7	20.5	2.9	3.8
Pre-U Short Course		'..'	'..'	'..'	'..'
Principal Learning		86.1	11.2	1.8	0.8
Progression Diploma		84.6	10.8	1.5	3.1
All students		81.4	13.5	3.7	1.4

Table 3.22 shows the subject areas studied at university by students with particular prior qualifications. The distribution of subjects studied by students with BTECs is markedly different from the average, whereas OCR Nationals are more similar, partly because Nationals students were more likely to have also taken A Levels (see Table 3.9). Students with a BTEC were far more likely than average to study 'Creative Arts and Design', and much less likely to study 'Historical and Philosophical Studies', 'Linguistics, Classics and related subjects', 'Medicine and Dentistry', 'Physical Sciences' and 'Social Studies'. Students with Double A/AS Levels were more likely than average to study 'Education' and 'Subjects allied to Medicine' at university, probably due to the nature of specific courses offered at Double A/AS Level. Courses in 'Biological Sciences' (the most popular subject area at university) were studied by similar proportions of students holding most qualifications, although those with BTECs were slightly more likely than average to follow courses in this area.

Students with a Pre-U Principal Subject qualification were more likely to study languages, 'Historical and Philosophical Studies', 'Linguistics, Classics and related subjects' and 'Social Studies', and less likely than average to study science subjects (except 'Medicine and Dentistry'). This may reflect patterns of uptake of various subjects of Pre-U by English schools. Students with the IB qualification were also over-represented in similar areas to those with a Pre-U, but with the addition of 'Law' and 'Physical Sciences'. IB and Pre-U students were particularly unlikely to study 'Creative Arts & Design' or 'Mathematical and Computer Sciences' at university.

Table 3.23 presents the same information by prior programme of study. There is a clear difference in the popularity of most university subject areas between academic and mixed/vocational students. Those students with a mixture of qualifications were more likely to enrol on courses in 'Business and Administrative Studies', 'Education' and 'Mathematical and Computer Sciences'.

Table 3.22: University subject areas studied by students with particular prior qualifications (as a percentage of total students with each qualification progressing to HE)

Prior qualification		*University subject area*									
		Architecture, Building and Planning	***Biological Sciences***	***Business and Administrative Studies***	***Creative Arts and Design***	***Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects***	***Education***	***Engineering***	***European Languages, Literature and related subjects***	***Historical and Philosophical Studies***	***Law***
A Level		1.7	11.4	10.2	10.0	0.3	3.0	4.8	1.7	5.0	4.3
A Level (Double)		1.1	6.8	20.5	10.9	0.0	9.8	1.7	0.1	0.5	2.2
AS Level		0.0	11.8	16.2	8.8	0.0	13.2	2.9	0.0	1.5	0.0
AS Level (Double)		1.6	12.0	9.8	8.1	0.4	2.8	5.1	1.8	5.3	4.4
A+AS Level combined		2.5	9.9	10.5	7.4	0.0	7.4	3.7	0.0	0.0	3.1
Advanced Diploma		7.5	1.4	14.9	13.1	0.0	6.0	11.8	0.0	0.3	1.2
Asset Languages		'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'
BTEC	All types	2.0	14.0	15.8	19.7	0.0	4.9	4.1	0.1	0.4	2.1
	Award	2.5	10.7	18.3	15.4	0.0	5.3	3.2	0.3	1.2	3.5
	Certificate	1.5	14.9	25.3	10.9	0.0	4.8	3.6	0.1	0.4	2.5
	Diploma	2.0	14.5	13.0	22.6	0.0	5.0	4.4	0.0	0.2	1.7
Extended Project		1.6	11.7	7.0	7.0	0.3	2.6	4.1	1.9	6.9	5.6
Free Standing Maths		3.4	11.0	8.6	6.4	0.5	1.5	12.5	0.7	1.7	2.4
Functional Skills Level 2		3.7	10.3	13.1	15.3	0.0	5.2	7.3	0.1	0.6	2.0
IB		2.1	11.8	6.1	3.4	0.9	1.1	3.9	4.1	8.9	5.2
Key Skill Level 2		1.4	12.6	12.9	18.4	0.1	4.5	4.7	0.3	1.1	3.2
Key Skill Level 3/4		1.4	11.0	10.3	11.6	0.1	4.4	4.1	1.5	3.8	5.7
OCR National	All types	1.4	10.2	19.1	7.7	0.1	6.0	3.6	0.2	1.3	2.9
	Certificate	1.6	9.7	19.0	7.4	0.1	5.4	4.2	0.2	1.6	3.2
	Diploma	1.1	10.1	20.6	7.1	0.0	8.0	2.4	0.5	0.7	2.7
	Extended Diploma	0.0	12.4	13.7	11.1	0.3	7.2	1.0	0.0	0.3	0.3
Pre-U GPR		3.7	12.9	3.7	6.8	1.8	0.6	3.1	0.6	13.5	1.8
Pre-U Principal Subject		2.2	5.2	5.8	7.5	1.5	0.7	3.1	7.4	12.4	2.5
Pre-U Short Course		'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'
Principal Learning		7.2	1.3	15.9	14.3	0.0	6.2	11.7	0.0	0.3	1.1
Progression Diploma		4.6	1.5	26.2	10.8	0.0	3.1	15.4	0.0	0.0	0.0
All students		1.7	11.7	10.8	11.4	0.3	3.3	4.8	1.5	4.4	3.9

Table 3.22 (continued): University subject areas studied by students with particular prior qualifications (as a percentage of total students with each qualification progressing to HE)

Prior qualification		*University subject area*									
		Linguistics, Classics and related subjects	***Mass Communications and Documentation***	***Mathematical and Computer Sciences***	***Medicine and Dentistry***	***Physical Sciences***	***Social Studies***	***Subjects allied to Medicine***	***Technologies***	***Veterinary Sciences, Agriculture and related subjects***	***Other Combined***
A Level		4.6	3.2	5.7	2.2	5.9	8.9	5.9	0.6	1.1	9.6
A Level (Double)		0.6	1.3	9.8	0.0	1.8	8.7	17.4	0.3	0.2	6.5
AS Level		1.5	4.4	17.7	0.0	1.5	2.9	7.4	0.0	1.5	8.8
AS Level (Double)		4.7	3.0	5.9	2.4	6.4	9.1	6.1	0.6	1.1	9.8
A+AS Level combined		1.2	1.2	6.8	0.0	3.7	12.4	19.8	0.0	0.6	9.9
Advanced Diploma		0.0	6.7	10.9	0.0	1.0	7.9	11.3	1.0	0.5	4.6
Asset Languages		'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'
BTEC	All types	0.4	4.1	9.4	0.0	1.5	5.1	6.6	1.3	1.9	6.5
	Award	1.1	4.7	9.8	0.0	2.1	6.3	5.2	1.3	1.1	8.0
	Certificate	0.7	2.7	10.0	0.0	1.7	5.4	5.9	0.8	1.0	7.8
	Diploma	0.2	4.3	9.4	0.0	1.3	4.8	7.1	1.4	2.3	5.9
Extended Project		6.5	2.9	5.3	4.2	6.3	8.8	5.7	0.4	1.4	10.0
Free Standing Maths		2.0	1.0	12.7	6.2	10.3	6.2	5.2	1.4	0.8	5.6
Functional Skills Level 2		0.6	4.3	10.8	0.1	2.2	6.0	9.1	1.1	2.3	5.9
IB		7.0	1.0	2.5	4.5	7.3	12.4	3.7	0.5	0.6	13.1
Key Skill Level 2		1.2	3.5	9.2	0.4	2.3	6.0	7.6	1.2	2.6	6.7
Key Skill Level 3/4		5.5	4.1	6.4	1.6	4.7	7.8	6.2	0.6	1.5	8.0
OCR National	All types	1.7	5.8	14.7	0.1	2.1	6.8	7.6	0.7	0.5	7.5
	Certificate	2.1	4.6	16.4	0.0	2.9	6.4	5.4	0.6	0.7	7.8
	Diploma	1.4	7.7	12.2	0.1	0.8	6.9	8.9	1.1	0.2	7.4
	Extended Diploma	0.3	8.5	8.8	0.0	0.3	8.8	20.9	0.0	0.0	5.9
Pre-U GPR		6.1	1.8	3.1	6.1	6.8	11.0	3.7	0.6	0.0	12.3
Pre-U Principal Subject		10.4	1.2	3.6	3.1	4.8	12.3	1.0	0.3	0.4	14.9
Pre-U Short Course		'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'	'..'
Principal Learning		0.1	6.5	9.8	0.0	0.6	7.4	10.5	1.1	0.6	5.5
Progression Diploma		0.0	4.6	7.7	0.0	1.5	6.2	7.7	1.5	1.5	7.7
All students		4.0	3.3	6.2	1.9	5.3	8.4	6.1	0.7	1.2	9.2

Table 3.23: University subject areas studied by students by prior programme of study (as a percentage of total students progressing to HE)

Programme of study	***University subject area***									
	Architecture, Building and Planning	***Biological Sciences***	***Business and Administrative Studies***	***Creative Arts and Design***	***Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects***	***Education***	***Engineering***	***European Languages, Literature and related subjects***	***Historical and Philosophical Studies***	***Law***
Academic	1.7	11.5	9.6	9.8	0.4	2.8	5.0	1.8	5.3	4.3
Mixed	1.8	10.9	16.0	13.5	0.1	5.6	3.7	0.6	1.8	3.9
Vocational	1.9	14.0	14.8	20.7	0.0	5.0	4.3	0.0	0.2	1.7
All students	1.7	11.7	10.8	11.4	0.3	3.3	4.8	1.5	4.4	3.9

Table 3.23 (continued): University subject areas studied by students by prior programme of study (as a percentage of total students progressing to HE)

Programme of study	***University subject area***									
	Linguistics, Classics and related subjects	**Mass Communications and Documentation**	**Mathematical and Computer Sciences**	**Medicine and Dentistry**	**Physical Sciences**	**Social Studies**	**Subjects allied to Medicine**	**Technologies**	**Veterinary Sciences, Agriculture and related subjects**	**Other Combined**
Academic	4.7	3.1	5.4	2.4	6.1	9.0	5.8	0.6	1.1	9.8
Mixed	2.4	4.4	8.7	0.5	2.7	6.8	7.4	0.8	0.7	7.8
Vocational	0.1	3.8	9.8	0.0	1.4	5.2	7.6	1.4	2.3	5.8
All students	4.0	3.3	6.2	1.9	5.3	8.4	6.1	0.7	1.2	9.2

Further analysis was carried out by individual course subject and the subjects which were over- and under-represented among students with particular prior qualifications were identified using Pearson residuals[25].

Qualification–subject combinations with residuals of magnitude at least 10 are presented in Table 3.24, for the 50 university courses with the highest magnitude residuals. Joint honours courses evenly split across subject areas (such as French and Business Studies) are not included in this analysis, but major/minor combinations are (in which case the course subject shown is the major part), as well as joint honours courses where both subjects are in the same area, such as French and Spanish (in this case the course subject shown is the first JACS code alphabetically). Many of the combinations in the table involve students with BTECs, who were more likely to follow courses in applied or vocational subjects such as 'Sports science', 'Computer science' and design subjects, but less likely to do traditional academic courses such as 'Economics', 'English studies', 'Mathematics' and 'History', which students with A and AS Levels were more likely to enrol on. Students with an Extended Project qualification in addition were more likely to study medicine courses, 'English studies' or 'History by period'. Students with Double A Levels were more likely to study 'Business studies', 'Education' and 'Nursing', reflecting the subjects offered in this qualification. OCR National students were more likely to pursue courses in 'Nursing', computing subjects and 'Training teachers – nursery'.

[25] Pearson residuals were calculated by cross-tabulating prior qualifications against course subject. For each 'cell' of the cross-tabulation, the Pearson residual is calculated as $(e_{ij} - o_{ij})/\sqrt{e_{ij}}$, where o_{ij} is the actual number of students with qualification i progressing to course j, and e_{ij} is the estimated number if the progression rate applied across all prior qualifications (that is, assuming students with any prior qualification were equally likely to follow the course). Residuals with large magnitude indicate that students with qualification i were disproportionately likely (or disproportionately unlikely) to follow course j.

Table 3.24: Prior qualification and subject combinations with highest magnitude Pearson residuals

Course	***Over-represented among students with:***	***Under-represented among students with:***
Pre-clinical medicine	Extended Project	BTEC
Clinical medicine	Extended Project Free Standing Maths	BTEC
Pharmacy		BTEC
Paediatric nursing	A Level (Double)	
Adult nursing	A Level (Double) AS Level (Double) BTEC Functional Skills Level 2 Key Skill Level 2 OCR National Extended Diploma	A Level
Mental health nursing	A Level (Double), BTEC	
Cardiography	Pre-U GPR	
Biology		BTEC
Sports science	BTEC Key Skill Level 2	A Level AS Level Extended Project
Psychology	A Level AS Level	BTEC
International agriculture	Progression Diploma	
Chemistry	AS Level	BTEC
Physics	AS Level	BTEC
Forensic science	BTEC	
Physical geographical sciences		BTEC
Mathematics	A Level AS Level	BTEC
Computer science	A Level (Double) BTEC Functional Skills Level 2 Key Skill Level 2 OCR National Certificate	A Level AS Level
Networks & communications	BTEC	
Multimedia computing science	BTEC OCR National Certificate	
Information systems	A Level (Double) BTEC OCR National Certificate	
Software engineering	BTEC	
Software design	BTEC	
Audio technology	BTEC	
Economics	AS Level	BTEC
Politics		BTEC
Public administration	BTEC	
Social work	A Level (Double)	
Health & welfare	A Level (Double)	
Human & social geography	AS Level	BTEC

Table 3.24 (continued): Prior qualification and subject combinations with highest magnitude Pearson residuals

Course	***Over-represented among students with:***	***Under-represented among students with:***
Law by topic		BTEC
Business studies	A Level (Double) BTEC OCR National Certificate	
Hospitality, leisure, tourism & transport	BTEC	
Recreation, sport & leisure studies	BTEC	
Linguistics, classics & related subjects	IB Overall Result	
English studies	A Level Extended Project	BTEC
English literature		BTEC
Classical studies	Pre-U Principal Subject	BTEC
French studies	Pre-U Principal Subject	BTEC
Others in Eastern, Asiatic, African, American & Australasian languages, literature & related subjects	Pre-U Short Course	
History by period	A Level AS Level Extended Project	BTEC
Philosophy		BTEC
Graphic design	BTEC	AS Level
Clothing/fashion design	BTEC Key Skill Level 2	AS Level
Drama	BTEC	
Dance	BTEC	
Visual & audio effects	A+AS Level combined	
Training teachers - nursery	OCR National Extended Diploma	
Training teachers - coaching	BTEC	
Research & study skills in education	BTEC	
Academic studies in education	A Level (Double)	

The preceding analysis showed that students with certain vocational qualifications were over-represented in certain areas, but not necessarily the same as each other. For example, Table 3.22 shows that the popularity of courses in 'Business and Administrative Studies', while higher than average among BTEC students, varied considerably according to the type of BTEC. 25% of those with a Certificate went on to study in the 'Business and Administrative Studies' area, compared to 13% of those with a Diploma. Similarly, 5% of those with an OCR National Certificate went on to study 'Subjects allied to Medicine', but 21% of those with an Extended Diploma. This may be due in part to differences in the provision and uptake of subjects offered by these qualifications. For example, 67% of OCR National Certificate qualifications in the dataset were in ICT so this will tend to dominate the results for the qualification as a whole. The following section covers three of the most popular vocational qualifications: Double (applied) A Level, BTEC and OCR Nationals.

The most popular subject studied at Double A Level (among the students represented in the dataset) was Health and Social Care, with 1380 of 3480 entries. Table 3.25 shows a strong relationship between university subject area and subject of prior qualification. For example, 39% of students with a Health and Social Care prior qualification took a course in 'Subjects allied to Medicine', while 58% of those with an Applied ICT prior qualification went on to study a course in 'Mathematical and Computer Sciences'.

Table 3.25: Subject area of study for students with Double A Level

Double A Level subject	***Percentage of all Double A Levels***	***Most popular university subject area***	***Percentage of students going on to study***
Applied Art & Design	11.2	Creative Arts & Design	75.8
Applied Business	26.2	Business & Administrative Studies	58.6
Applied ICT	11.0	Mathematical and Computer Sciences	58.1
Applied Science	8.5	Biological Sciences	30.3
Health and Social Care	39.7	Subjects allied to Medicine	39.0
Leisure and Recreation	1.2	Business & Administrative Studies	'..'
Travel and Tourism	2.2	Business & Administrative Studies	61.3

At BTEC, patterns were different depending on the level of the qualification. For the Award (equivalent to a single A Level) the most popular subjects were Business and Services (21% of all entries for students who progressed to HE), Sport (13%) and IT (12%). Entries in the Certificate (equivalent to a Double A Level) were also dominated by Business and Services (26%) and Sport (23%), whereas the most popular subjects in the Diploma (worth three A Levels) were Sport (17%), Art and Design (16%) and Business and Services (11%). Table 3.26 shows that the most popular university subject areas for students with BTECs were closely aligned to the subject of the BTEC, and the strength of the association was greater for the Diploma and Certificate, which carry more weight than the Award.

Table 3.26: Subject area of study at university for students with BTECs

BTEC subject	*Most popular university subject area*	*Percentage of students in this subject area*		
		Award	*Certificate*	*Diploma*
Applied Science	Biological Sciences	15.8	27.4	32.5
Art & Design	Creative Arts and Design	59.1	68.9	83.0
Business and Services	Business and Administrative Studies	37.7	62.9	65.7
Children and Young People	Education	34.9	'..'	70.4
Construction and the Built Environment	Architecture, Building and Planning	50.0	'..'	76.5
Engineering	Engineering	37.1	71.3	84.4
Health and Social Care	Subjects allied to Medicine	23.3	35.0	53.5
Hospitality	Business and Administrative Studies	27.0	..	84.3
IT	Mathematical and Computer Studies	27.1	59.9	73.3
Land-based and environment	Veterinary Sciences, Agriculture and related subjects	'..'	'..'	70.8
Media	Mass Communications and Documentation	21.0	30.1	41.1
Music	Creative Arts and Design	37.6	47.4	55.6
Performing Arts	Creative Arts and Design	42.3	63.0	79.7
Public Services and Uniformed Services	Social studies	18.8	'..'	43.4
Sport	Biological Sciences	33.3	49.5	66.0
Travel and Tourism	Business and Administrative Studies	36.2	78.5	83.2

For OCR Nationals, three levels of study were available: Certificate (carrying the same weight as one A Level), Diploma (worth two A Levels) and Extended Diploma (worth three A Levels). The most popular subject at Certificate level among the students represented here was overwhelmingly ICT (67% of entries), with the next most popular being Business Management (13%). At Diploma level there was a more even mix, with the most popular subjects being ICT (26%) and Health and Social Care (22%). However, at Extended Diploma level the pattern was different again, with Health and Social Care dominating (37% of entries) followed by Media and Communication (20%). Table 3.27 shows that, as with BTECs, the strength of the relationship between National subject and field of study at university varied according to the weight of the qualification, but also according to the National subject studied. For example, only 21% of students with an Certificate in ICT were studying within the 'Mathematical and Computer Studies' area, while 44% of those with a Certificate in Travel and Tourism were studying within a related area at university ('Business and Administrative studies'). This suggests that ICT may have been taken as more of an enabling or supporting subject, while Travel and Tourism was taken more frequently by students who wished to pursue interests in this area.

Table 3.27: Subject area of study at university for students with OCR Nationals

OCR National subject	***Most popular university subject area***	***Percentage of students in this subject area***		
		Certificate	***Diploma***	***Extended Diploma***
Business Management	Business and Administrative Studies	36.1	65.8	'..'
Health and Social Care	Subjects allied to Medicine	27.2	35.4	54.1
ICT	Mathematical and Computer Studies	21.3	37.5	'..'
Media and Communication	Mass Communications and Documentation	21.8	40.1	40.3
Sport, Leisure and Recreation	Biological Sciences	38.9	53.9	'..'
Travel and Tourism	Business and Administrative Studies	43.6	'..'	'..'

3.4 Distribution of mainstream prior qualifications, and combinations of those, over HE institutions and subjects: statistical modelling

As stated in Section 2.2, an assessment of the universities in which the different prior qualifications or programmes of study are over or under represented can be made using the odds ratios derived from the multilevel logistic regressions.

In the following, the multilevel logistic regression models fitted in this section are described in detail.

The dependent variable was the enrolment in a type of university (or pursuing a course in a subject area) with the variable taking the value 1 if the candidate was enrolled in the university (or pursuing a course in a subject area) and 0 otherwise.

The independent or explanatory variables were: gender, prior educational institution, socio-economic status and prior learning (see Table 3.28). Prior learning was categorised in three different ways:

a) Candidates were classified as having the following types of prior qualifications, and no other types of qualifications alongside:
    - A Level
    - IB
    - Pre-U
    - BTEC
    - OCR National

b) Candidates were classified as having A Levels plus one other type of mainstream prior qualification, as follows:
    - A Levels only
    - A Levels + Extended Project
    - A Levels + Pre-U (principal subject)
    - A Levels + GPR
    - A Levels + BTEC
    - A Levels + OCR National
    - A Levels + Double Award A Level

c) Candidates were classified as pursuing one of the following programmes of study (as defined in Section 2.2):
    - General academic
    - Vocational
    - Mixed

Note that it is important to control for students' characteristics to avoid misleading conclusions about the association between prior learning and higher education institution and/or subject. Appendix E shows the relationship between students' background characteristics and the uptake of prior qualifications.

Table 3.28: Description of the variables included in the multilevel logistic regression models presented in Section 3.4

	Name	Description	Range of values
Dependent variables	Candidate enrolled in a type of university	Indicator of university enrolment	Discrete variable: 0 was not enrolled at the university; 1 was enrolled at the university.
	Candidate pursuing a course in a subject area	Indicator of subject area uptake at university	Discrete variable: 0 did not take a course in the subject area; 1 took a course in the subject area.
Independent variables	Gender	Gender of the candidate	Discrete variable: male; female.
	Level of deprivation (IDACI)	Candidate level of deprivation based on the income deprivation affecting children index	Discrete variable: low, average, high.
	Centre type	Type of institution the candidate attended prior to university	Discrete variable: comprehensive; independent; academy; sixth form college; selective; FE college; other.
	Prior qualification	One or several mainstream prior qualifications	See text above

The formal representation of the model is:

$$\log\left(\frac{p_{ij}}{1-p_{ij}}\right) = \beta_0 + \beta_1 Gender_{ij} + \beta_2 Centre\ type_j + \beta_3 Deprivation_{ij} + \\ + \beta_4\ Prior\ qualification_{ij} + u_j$$

where p_{ij} is the probability of student i in prior institution j attending a university (or studying a course in a subject area), β_0 to β_4 are the regression coefficients and u_j is a random variable at the prior institution level which follows a normal distribution with mean zero.

As explained in the methodology section of this report, an odds ratio represents the factor of increase in the odds of attending a university (or studying a subject) when the value of a categorical independent variable changes from the baseline to a specified category. An odds ratio greater than 1 indicates an increase in the likelihood of attending a university (or studying a subject), with a greater odds ratio indicating a greater likelihood. Conversely, an odds ratio less than 1 indicates a decrease in the likelihood of attending a university (or studying a subject), with a smaller odds ratio indicating a smaller likelihood. And, finally, an odds ratio equal to 1 indicates an equal likelihood of attending a university (or studying a subject).

The focus of this research is on the effect of the prior qualifications on the dependent variables, once background characteristics of the students had been taken into account. Therefore, only odds ratios for prior qualifications are presented here.

3.4.1 Enrolment in a type of university

Figures 3.6 and 3.7 present the odds ratios for prior qualifications in comparison to A Levels[26], that is, the likelihood of being in a specific university mission group of someone with a traditional background (A Levels only) compared with that of someone with a non-traditional academic qualification. The reference group, A Levels only, is not shown in the figures, as all values for the odds ratios would be 1. Odds ratios below 1 show a comparatively lower likelihood of being in a specific university group; odds ratios over 1 show an increased likelihood.

Figure 3.6 shows that students who followed a full IB programme prior to entry at university were more likely to study in a Russell Group university or in a university member of the 1994 Group than those who followed a more traditional pathway and studied A Levels only (higher likelihood in a Russell Group university). On the other hand, IB students were less likely to study in universities of the Million+ Group or the University Alliance (lower likelihood in a Million+ Group university).

As shown in Table 3.8 (Section 3.2), there was a relatively small number of students progressing to university with only Pre-U qualifications; in fact, the number of candidates entering for Pre-U in June 2012 was just under 1700 (National Pupil Database, 2011/12 Key Stage 5 extract). However, those Pre-U students who progressed to university were much more likely to study in a Russell Group university than the students holding any other prior qualifications. Similarly to IB students, Pre-U students were under-represented in universities of the Million+ Group or the University Alliance.

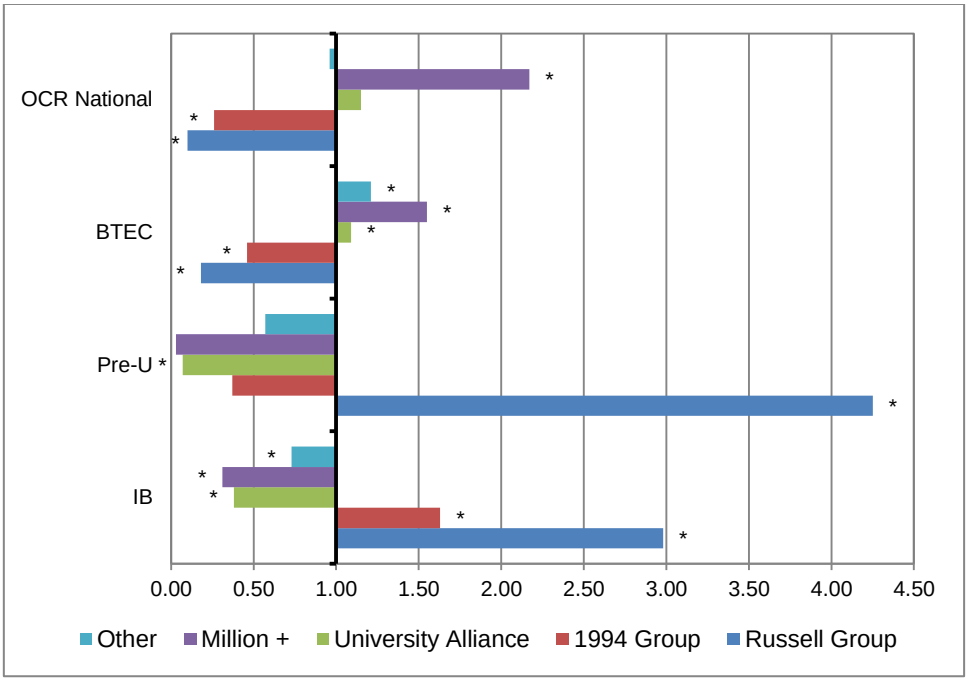
The opposite pattern was found for students holding BTEC qualifications or OCR Nationals, that is, those students were less likely to attend universities in the Russell or the 1994 groups than students holding only A Levels and were more likely to attend universities in the University Alliance or the Million+ Group compared to those with A Levels.

Figure 3.7 shows that having an Extended Project qualification alongside A Levels increased the probability of attending a university in the Russell or 1994 groups. The Extended Project, a qualification requiring a high degree of planning, preparation, research and autonomous working, has been praised by universities, especially competitive ones, as it demonstrates commitment to a subject and allows to develop the independent research skills needed for undergraduate study (*e.g.* http://www.manchester.ac.uk/undergraduate/schoolsandcolleges/post-16/epq/). It is therefore not surprising that higher numbers of students with this qualification attended competitive universities than other types of universities.

[26] Tables with the odds ratios presented in Figures 3.6 to 3.8 are given in Appendix F.

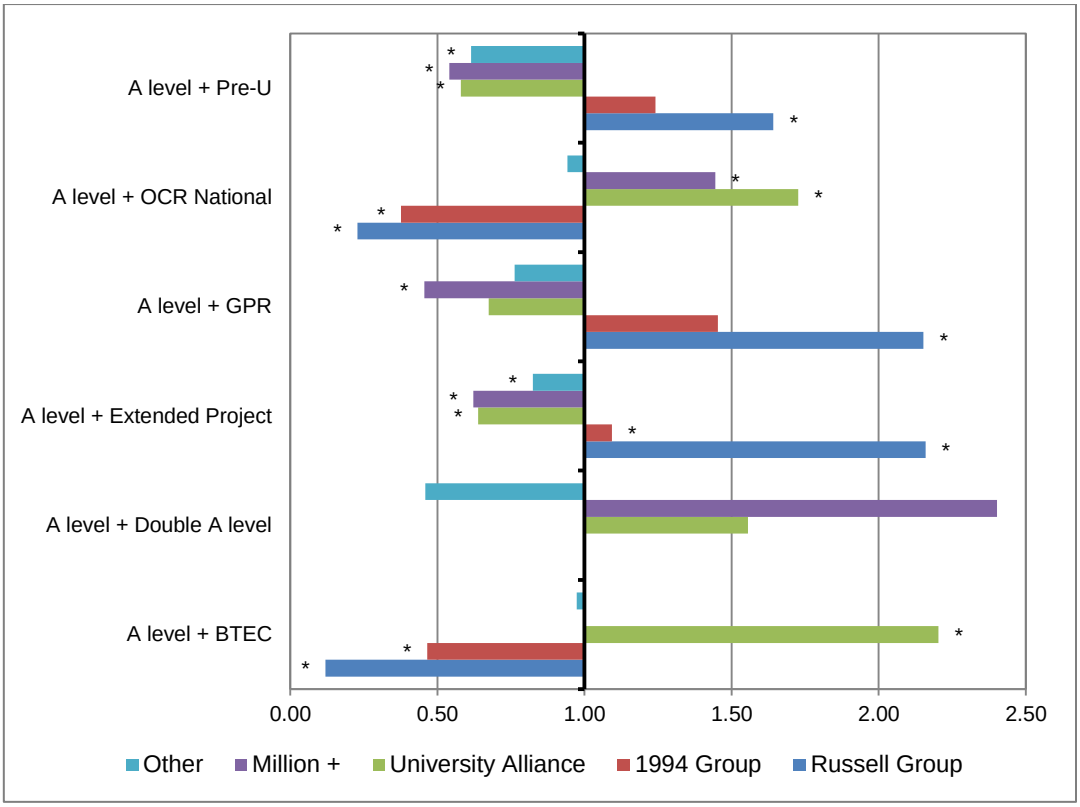
Similarly, holding a Pre-U GPR qualification alongside A Levels (and also, to some extent, holding a Pre-U qualification in a principal subject) increased significantly the probability of attending a university in the Russell Group (increases in the probability of attending a university in the 1994 group were not statistically significant). As for the Extended Project, the nature of GPR which both develops students' critical and analytical skills and broadens their understanding of the world, can explain this result. GPR has also been praised by competitive universities as an excellent preparation for undergraduate study giving real evidence of independent, critical thinking (http://www.cie.org.uk/qualifications/academic/uppersec/preu/subjects/subject/preusubject?assdef_id=1018).

On the contrary, having an OCR National or a BTEC qualification alongside A Levels decreases the likelihood of attending universities in the more competitive universities (Russell Group and 1994 Group) but increases the likelihood of attending universities in the Million+ Group and in the University Alliance.



* significant estimates at the 5% level

Figure 3.6: Odds ratios for mainstream prior qualifications in comparison to A Levels (candidates have only the stated qualification)



* significant estimates at the 5% level

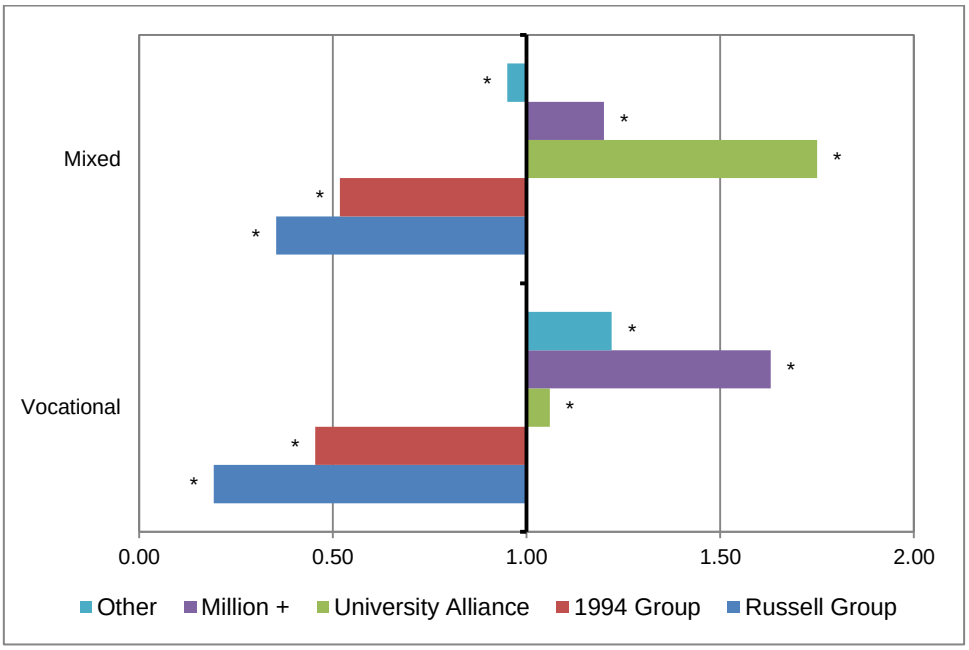
Figure 3.7: Odds ratios for combinations of prior qualifications in comparison to A Levels only

Figure 3.8 presents the odds ratios for non-academic programmes of study in comparison to an academic programme of study, that is, the likelihood of being in a specific university mission group of someone with a traditional background (academic programme of study) is compared with that of someone with a non-traditional academic background (mixed and vocational programmes of study).

In line with outcomes reported from Figures 3.6 and 3.7, Figure 3.8 shows that students who followed a vocational or mixed programme of study prior to entry at university were less likely to study in a Russell Group university or in a university member of the 1994 Group than those who followed an academic programme. On the other hand, vocational students were more likely to study in universities of the Million+ Group and students with a mixed background were over-represented in institutions belonging to the University Alliance.

The above results support, once more, the common expectation that students with more academic backgrounds are more likely to go to universities in the Russell and 1994 groups and those holding vocational qualifications are more likely to study in other types of universities (*e.g.* universities in the University Alliance or in the Million+ Group). It should be noted that one reason for this could be that the more applied/vocational subjects are over-represented in some types of institutions (as shown in Figure 3.1 in Section 3.2 of this report) and, for example, candidates with vocational backgrounds are more attracted to those types of subjects and therefore their university choices are determined somehow by their subject choices.

To control for this, the subject area at university was taken into account in the models. Tables F1(b) and F2(b) in Appendix F present the odds ratios for prior qualifications in comparison to A Levels, that is, the likelihood of being in a specific university group of someone with a traditional background (A Levels only) is compared with that of someone with a non-traditional academic qualification once the subject at university was controlled for. Similarly, Table F3(b) presents the odds ratios for non-academic programmes of study in comparison to an academic programme of study, once the subject at university was controlled for. These tables show that, after controlling for subject at university, the odds ratios for prior qualifications remain almost identical.



* significant estimates at the 5% level

Figure 3.8: Odds ratios for vocational and mixed programmes of study in comparison to academic

3.4.2 Subject area at university

Tables 3.29 and 3.30 present the odds ratios for prior qualifications in comparison to A Levels, that is, the likelihood of taking a university course in a specific subject area of someone with a traditional background (A Levels only) is compared with that of someone with a non-traditional academic qualification. As before, the reference group, A Levels only is not shown in the figures, as all the odds ratios would be 1. Odds ratios below 1 show a comparatively lower likelihood of studying a university course; odds ratios over 1 show an increased likelihood.

First of all, Table 3.29 shows that students who followed a full IB programme prior to entry at university were more likely to study courses in the areas of languages and literature than those who studied A Levels only (odds ratios around 2 for both European and non-European languages and around 1.5 for linguistics and classics). IB students were also more likely to study 'Medicine and Dentistry' by a factor of 1.7, 'Historical and Philosophical Studies' by a factor of 1.6 and were also more likely to study courses in the areas of 'Law', 'Physical Sciences' or 'Social Studies'. On the contrary, they were less likely than A Level students to study courses in the subject areas of 'Creative Arts and Design', 'Education', 'Mathematics and Computer Sciences', 'Business and Administrative studies', 'Engineering', 'Subjects

allied to Medicine', 'Mass Communications and Documentation' and 'Veterinary Sciences, Agriculture and related subjects'.

There were no statistically significant differences between the students holding only Pre-U qualifications and only A Level qualifications in the majority of the subject areas. The only significant differences appeared in the 'European Languages, Literature and related subjects' and the 'Linguistics, Classics and related subjects' areas. In those two subject areas, Pre-U students were much more likely than A Level students to be pursuing a course (odds ratios around 5 and 3 respectively).

Regarding the more vocational qualifications (BTECs or OCR Nationals) the most extreme differences were found in some academic subject areas such as the languages (*e.g.* the likelihood of someone holding just BTEC qualifications entering a course in the area of European languages was more than 50 times lower than for a student with A Levels), 'Historical and Philosophical Studies' (14 times lower) or 'Physical Sciences' (3 times lower). BTEC and OCR National students were also less likely than A Level students to study in the areas of 'Engineering', 'Law' or 'Social Studies' than students with academic qualifications.

However, these vocational students were over-represented in 'Biological Sciences', 'Creative Arts and Design' (BTEC students only), 'Business and Administrative Studies', 'Mathematical and Computer Sciences', 'Education' and 'Subjects allied to medicine'. It should be noted that the majority of these university subject areas correspond with BTEC sectors and OCR National subjects and therefore it is not surprising that students with these prior qualifications are more attracted to the above university subject areas.

Table 3.30 shows that students holding an Extended Project qualification alongside their A Levels were more likely to study 'Medicine and Dentistry' than students without it. It could be the case that in competitive courses such as these, the Extended Project had been used to differentiate among straight A candidates at A Level. These students were also more likely to study a degree in the following subject areas: 'European Languages, Literature and related subjects', 'Historical and Philosophical studies', 'Linguistics, Classics and related subjects', 'Law', 'Physical Sciences' and 'Veterinary Sciences, Agriculture and related subjects'. On the other hand, they were less likely to study a degree in the majority of the remaining subject areas.

Students holding Pre-U qualifications alongside A Levels were more likely to study courses in the areas of languages and literature than those who studied A Levels only (odds ratio over 2.5 for non-European languages and almost 3 for European languages). Students with A Levels and Pre-U qualifications were also over-represented in 'Historical and Philosophical Studies' by a factor of 1.5 and 'Creative Arts and Design' by a factor of 1.8. On the contrary, they were less likely than students holding A Levels only to pursue courses in the subject areas of 'Biological Sciences', 'Medicine and Dentistry', 'Engineering', 'Physical Sciences', 'Subjects allied to Medicine' and 'Veterinary Sciences, Agriculture and related subjects'. It is worth pointing out here that the choice of university degree might also depend on the subject of the prior qualification and, in the case of Pre-U, the most popular principal subjects in the June 2012 examination series (NPD, 2011/12 Key Stage 5 extract) were Literature in English, History, Mathematics, French, Economics and Philosophy and Theology, which supports the relationships reported in this paragraph.

There were no statistically significant differences between the students holding A Levels and Pre-U GPR qualifications and those holding only A Level qualifications in the majority of the subject areas. The only significant differences appeared in the areas of 'Historical and Philosophical Studies' and 'Business and Administration Studies', with odds ratios around 2.3 and 0.4 respectively.

Regarding holding A Levels and one of the more vocational qualifications (BTECs or OCR Nationals) the most extreme differences were found in some academic subject areas such as the languages (*e.g.* the likelihood of someone holding a BTEC alongside the A Levels entering a course in the area of European languages was around 4 times lower than for a student with A Levels only), 'Historical and Philosophical Studies' or 'Physical Sciences'. Students with BTEC and OCR Nationals alongside A Levels were also less likely to study in the areas of 'Engineering', 'Law', 'Medicine and Dentistry' or 'Subjects allied to Medicine' than students with only academic qualifications.

However, students holding BTECs or OCR Nationals alongside their A Levels were more likely to study for a degree in 'Biological Sciences' (BTEC students only), 'Creative Arts and Design', 'Business and Administrative Studies', 'Education', 'Mass Communications and Documentation', 'Mathematical and Computer Sciences' (OCR National students only) 'Social Studies' and 'Technologies'. These subject areas also attracted students with BTECs and OCR Nationals only (see Table 3.29) so it seems that when a student has a combination of A Levels and vocational qualifications, the latter might be driving the choice of subject at university.

Note that the odds ratios for the combination of A Levels and Double A Levels were not included in Table 3.30, as there were no statistically significant differences with A Levels only and in many of the subject areas there was no data to allow for comparison.

Finally, Table 3.31 presents the odds ratios for non-academic programmes of study in comparison to an academic programme of study, that is, the likelihood of taking a university course in a specific subject area of someone with a traditional background (academic programme of study) is compared with that of someone with a non-traditional academic background (mixed and vocational programmes of study).

As expected, students following a vocational programme of study were more likely (in comparison with students following an academic programme of study) to study a degree in 'Education', 'Creative Arts and Design', 'Business and Administrative Studies', 'Technologies' and 'Veterinary Sciences, Agriculture and related subjects' by a factor of around 2. They were also more likely to study courses in the following areas: 'Biological Sciences', 'Mathematical and Computer Sciences' and 'Subjects allied to Medicine'. However, vocational students were under-represented in the more academic subject areas (*e.g.* 'Historical and Philosophical Studies', 'European Languages, Literature and related subjects', 'Medicine and Dentistry' or 'Physical Sciences').

Odds ratios for students following a mixed programme of study were in line with those of students following a vocational one in the majority of the university subject areas. The only exception was in 'Veterinary Sciences, Agriculture and related subjects', where vocational students were more likely than their academic counterparts to study a course and mixed students were less likely.

Table 3.29: Odds ratios for mainstream prior qualifications in comparison to A Levels (candidates have only the stated qualification)

University subject area	***Prior qualification***			
	IB	***Pre-U***	***BTEC***	***OCR National***
Architecture, Building and Planning	1.23	1.02	0.93	**0.26**
Biological Sciences	1.10	0.01	**1.71**	0.92
Business and Administrative studies	**0.60**	0.35	**1.63**	**2.73**
Creative Arts and Design	**0.36**	2.60	**1.18**	**0.53**
Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects	**2.12**	-	**0.16**	-
Education	**0.48**	0.22	**2.29**	**2.18**
Engineering	**0.75**	0.30	**0.76**	**0.31**
European Languages, Literature and related subjects	**1.89**	**6.08**	**0.02**	-
Historical and Philosophical studies	**1.59**	1.39	**0.05**	**0.08**
Law	**1.39**	1.09	**0.35**	**0.45**
Linguistics, Classics and related subjects	**1.46**	**4.70**	**0.04**	-
Mass Communications and Documentation	**0.41**	-	**0.90**	**1.68**
Mathematical and Computer Sciences	**0.43**	1.29	**1.52**	**2.35**
Medicine and Dentistry	**1.70**	0.26	-	-
Other/Combined	**1.35**	0.84	**0.72**	**0.67**
Physical Sciences	**1.31**	0.86	**0.30**	**0.10**
Social studies	**1.24**	1.12	**0.66**	0.96
Subjects allied to Medicine	**0.68**	-	**1.38**	**2.33**
Technologies	0.80	-	**1.83**	1.08
Veterinary Sciences, Agriculture and related subjects	**0.44**	-	**1.72**	0.35

Note: Significant estimates at the 5% level are in bold

Table 3.30: Odds ratios for combinations of prior qualifications in comparison to A Levels only

University subject area	***Prior qualifications***				
	A Level + BTEC	***A Level + Extended Project***	***A Level + GPR***	***A Level + OCR National***	***A Level + Pre-U***
Architecture, Building and Planning	1.14	0.93	2.33	0.98	0.96
Biological Sciences	**1.11**	1.05	1.21	**0.75**	**0.58**
Business and Administrative studies	**1.83**	**0.57**	**0.40**	**1.85**	0.71
Creative Arts and Design	**1.65**	**0.61**	0.93	0.90	**1.80**
Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects	**0.09**	1.05	4.02	**0.43**	**2.56**
Education	**1.75**	**0.65**	0.33	**1.84**	0.52
Engineering	**0.56**	**0.87**	0.46	**0.73**	**0.40**
European Languages, Literature and related subjects	**0.31**	**1.18**	0.35	**0.31**	**2.74**
Historical and Philosophical studies	**0.29**	**1.61**	**2.51**	**0.44**	**1.45**
Law	**0.75**	**1.39**	0.51	0.79	0.83
Linguistics, Classics and related subjects	**0.34**	**1.58**	1.34	**0.60**	**2.02**
Mass Communications and Documentation	**1.28**	**0.78**	0.88	**1.74**	0.67
Mathematical and Computer Sciences	1.12	**0.83**	0.37	**2.58**	0.79
Medicine and Dentistry	**0.03**	**2.25**	2.12	**0.08**	**0.61**
Other/Combined	0.92	**1.10**	1.07	**0.74**	**1.53**
Physical Sciences	**0.31**	**1.16**	1.39	**0.38**	**0.52**
Social studies	**0.71**	1.01	1.14	**0.79**	1.06
Subjects allied to Medicine	**0.87**	**0.75**	0.67	0.94	**0.29**
Technologies	**1.99**	**0.63**	1.33	1.02	0.48
Veterinary Sciences, Agriculture and related subjects	1.04	**1.40**	-	0.62	**0.12**

Note: Significant estimates at the 5% level are in bold

Table 3.31: Odds ratios for programme of study in comparison to academic

University subject area	***Programme of study***	
	Vocational	***Mixed***
Architecture, Building and Planning	**0.86**	1.08
Biological Sciences	**1.54**	**0.94**
Business and Administrative studies	**1.70**	**1.78**
Creative Arts and Design	**1.12**	**1.13**
Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects	**0.12**	**0.23**
Education	**2.38**	**1.89**
Engineering	**0.76**	**0.76**
European Languages, Literature and related subjects	**0.03**	**0.43**
Historical and Philosophical studies	**0.05**	**0.40**
Law	**0.33**	**0.76**
Linguistics, Classics and related subjects	**0.04**	**0.50**
Mass Communications and Documentation	**0.87**	**1.20**
Mathematical and Computer Sciences	**1.65**	**1.55**
Medicine and Dentistry	**0.01**	**0.34**
Other/Combined	**1.22**	**0.95**
Physical Sciences	**0.30**	**0.45**
Social studies	**0.71**	**0.82**
Subjects allied to Medicine	**1.59**	**1.27**
Technologies	**1.79**	**1.50**
Veterinary Sciences, Agriculture and related subjects	**1.81**	**0.73**

Note: Significant estimates at the 5% level are in bold

4. Results: progression to HE from A Levels

Given the fact that A Levels are the main gateway to higher education, this section of the report investigated the distribution of A Level students over HE institutions and subject areas taking into account their educational background, in terms of specialism and attainment, prior to university entry.

The students considered throughout this section were those in the dataset studying at least three A Levels, excluding General Studies: 181190 students in total (72% of all students in the dataset). It is reasonable to assume that this group of students relied predominantly on their A Levels as a pathway to university, rather than on other qualifications. Each student was assigned a specialism category depending on their choice of subjects at A Level, as described in Appendix D.

Section 4.1 presents some descriptive evidence about the destinations of A Level students specialising in various areas, while Section 4.2 investigates how A Level specialism and attainment affects the HE mission group where students are enrolled and the subject area of study, employing regression models in order to control for other confounding factors.

4.1 Distribution of A level students over HE institutions and subjects: descriptive analyses

This section presents information on the destinations and subject of study of A Level students. In effect this is further breaking down the figures for A Levels shown in Section 3.3, although the population has been restricted in this section and so the totals for all A Level students presented here will not match those in Section 3.3 (which reported figures for all students taking one or more A Levels).

As previously shown in Table 3.19, students with A Levels predominantly went on to study at first degree level. Table 4.1 presents the breakdown of level of study by specialism at A Level, and shows that students specialising in languages or multiple areas were most likely to study at first degree level, whereas specialists in expressive or applied subjects were least likely to. Students that had specialised in expressive or applied subjects were more likely than average to take a foundation degree, and applied specialists were particularly strongly represented among those studying for an HND/HNC.

Table 4.1: Level of study by A Level specialism (percentage of students in category)

A Level specialism	*First degree*	*Foundation degree*	*HND/HNC*	*Other undergraduate*
None	97.0	1.9	0.5	0.6
Applied	95.7	2.7	1.1	0.5
Expressive	95.7	3.4	0.4	0.5
Humanities	98.3	1.1	0.2	0.4
Languages	99.5	0.4	0.0	0.1
STEM	98.6	0.8	0.1	0.5
Multiple	99.4	0.4	0.1	0.1
All A Level students	98.1	1.2	0.3	0.4

Table 4.2 presents the destinations of A Level students, in terms of HE mission groups, and shows a wide variation across specialisms at A Level. Students who had specialised in applied or expressive subjects at A Level were more likely to attend University Alliance or Million+ institutions. Linguists were particularly likely to go on to study at Russell Group universities (reflecting the concentration of language degrees at these institutions as shown in Figure 3.1), and those specialising in STEM or multiple areas were also more likely than average to attend Russell Group universities. Humanities specialists were represented more evenly across all mission groups.

Table 4.2: University mission group by A Level specialism (percentage of students in category)

A Level specialism	*Russell Group*	*1994 Group*	*University Alliance*	*Million+*	*Other*
None	20.0	6.3	32.8	15.4	25.4
Applied	8.5	4.1	41.1	22.7	23.5
Expressive	8.5	4.4	36.3	18.4	32.4
Humanities	27.5	8.1	25.8	14.0	24.6
Languages	61.2	7.2	10.2	4.0	17.4
STEM	47.4	7.3	20.1	7.1	18.1
Multiple	54.2	7.9	14.4	6.5	17.0
All A Level students	32.4	7.4	25.4	12.3	22.6

Table 4.3 shows the subject balance (indicating whether the degree was a single subject or a combination of subjects) by specialism at A Level. Students who had specialised in expressive or STEM subjects at A Level were most likely to have enrolled on a single honours degree, while linguists were much more likely than average to have gone on to study a joint honours course. Investigation of the joint honours courses (balanced and major/minor combinations) studied by language specialists revealed that 94% of these students took at least one language subject in their degree, and 62% of students took two language subjects.

Table 4.3: Subject balance by A Level specialism (percentage of students in category)

A Level specialism	*Single*	*Balanced combination*	*Major/minor combination*	*Triple*
None	81.4	13.8	3.6	1.2
Applied	80.7	14.9	3.5	0.9
Expressive	89.6	7.5	2.0	0.9
Humanities	77.1	18.3	3.5	1.2
Languages	45.8	41.5	6.9	5.8
STEM	84.2	8.2	5.4	2.2
Multiple	74.3	18.0	4.5	3.2
All A Level students	79.7	14.6	4.1	1.6

Table 4.4 shows the subjects that students of each A Level specialism went on to study in higher education. As might be expected, there is a strong relationship between A Level subject choices and the subject area studied at university. For example, 63% of students specialising in expressive subjects at A Level went on to study ‘Creative Arts and Design’ at university; likewise, 58% of those specialising in languages at A level enrolled on degree courses in ‘European Languages, Literature and related subjects’.

Students with multiple specialisms at A Level were particularly well represented in ‘European languages, Literature and related subjects’, ‘Law’, ‘Mathematical and Computer Sciences’, and ‘Social Studies’. Students with no specialism, who had taken a mixture of subjects, were highly represented in ‘Business and Administrative Studies’ and ‘Creative Arts and Design’ courses at university.

A particularly strong association between A Level subject choices and university subject area was found in ‘Medicine and Dentistry’. While 8.3% of STEM specialists, and 2.6% of multiple specialists went on to study a degree in this area, hardly any students from other specialisms did. This is because medicine courses typically require biology and chemistry at A Level, which would put students in the STEM category, or the multiple category if they had taken more additional subjects to add breadth.

A surprising result at first glance is the high proportion of students in many categories going on to take courses in ‘Biological Sciences’. This can be explained by the fact that, as well as biology, this group includes courses in psychology and sports science, and these subjects would be classed as a humanity and applied subject respectively at A Level.

Table 4.4: Subject area by A Level specialism (percentage of students in category)

A Level specialism	*University subject area*									
	Architecture, Building and Planning	***Biological Sciences***	***Business and Administrative Studies***	***Creative Arts and Design***	***Eastern, Asiatic, African, American & Australasian Languages, Literature & related subjects***	***Education***	***Engineering***	***European Languages, Literature and related subjects***	***Historical and Philosophical Studies***	***Law***
None	4.0	12.9	17.5	13.8	0.3	3.3	2.5	3.0	2.3	4.1
Applied	1.8	12.3	40.5	2.4	0.0	4.4	1.5	0.1	0.9	9.3
Expressive	6.8	1.2	4.8	63.3	0.0	2.5	3.3	0.2	0.9	0.2
Humanities	0.9	9.7	8.3	8.7	0.6	3.8	0.4	1.1	10.2	6.6
Languages	0.2	1.6	4.4	2.7	2.2	1.3	0.2	57.5	1.8	2.8
STEM	1.4	15.7	3.9	1.5	0.1	0.5	14.3	0.3	0.9	1.2
Multiple	1.4	11.9	6.0	5.8	0.5	1.5	3.0	7.4	5.6	6.2
All A Level students	1.6	11.8	9.3	7.8	0.4	2.7	5.0	1.9	5.6	4.6

A Level specialism	*University subject area*									
	Linguistics, Classics and related subjects	***Mass Communications and Documentation***	***Mathematical and Computer Sciences***	***Medicine and Dentistry***	***Physical Sciences***	***Social Studies***	***Subjects allied to Medicine***	***Technologies***	***Veterinary Sciences, Agriculture & related subjects***	***Other/ Combined***
None	2.0	2.0	5.1	0.0	3.6	7.3	5.3	0.8	1.3	8.8
Applied	0.6	1.5	5.9	0.0	1.1	6.4	3.5	0.3	0.7	6.6
Expressive	1.0	2.2	1.7	0.0	0.4	1.1	1.0	3.5	0.6	5.2
Humanities	9.4	5.3	1.3	0.0	2.8	14.2	2.8	0.3	0.5	13.2
Languages	2.8	0.2	0.8	0.0	0.8	3.6	0.9	0.1	0.1	16.2
STEM	0.4	0.2	12.6	8.3	14.8	3.5	12.0	0.6	2.0	5.8
Multiple	4.2	0.9	7.4	2.6	6.6	11.9	4.4	0.3	0.4	11.9
All A Level students	5.0	3.0	5.5	2.6	6.5	9.3	5.9	0.5	1.1	10.0

Tables 4.5 to 4.11 show the most popular 10 course subjects studied by each category of A Level student, and Table 4.12 shows the top 10 for all students with at least three A Levels. Joint honours courses evenly split across subject areas (such as French and Business Studies) are not included in these tables, but major/minor combinations are (in which case the course subject shown is the major part), as well as joint honours courses where both subjects are in the same area, such as French and Spanish (in this case the course subject shown is the first JACS code alphabetically).

As Table 4.5 shows, the most popular university subjects for students who did not specialise in a particular area, but took a wide variety of A Level subjects, were 'Business studies' and 'Sports science'. Both of these are more vocational courses, and students may have taken applied courses at A Level, but they may also have benefited from having studied related academic subjects, such as economics or mathematics for business studies, and biology for sports science. Many of the other subjects in the list (such as 'Psychology', 'Economics' and 'Architecture') are also at the boundaries between disciplines, so having a good mix of A Levels was likely to be beneficial.

Tables 4.6 to 4.10 show that students who had specialised in particular areas at A Level were most likely to pursue courses in these areas at university. However, 'Economics' featured in many of these lists (with the exception of students specialising in expressive subjects at A Level). 'Law' (by area or topic) featured in the top 10 choices of applied and humanities students (Tables 4.6 and 4.8). A Level law was classified as an applied subject (see Appendix D), and the split between applied and humanities students was probably caused by differing patterns of uptake of this subject. Another subject that appears in more than one list is 'Computer science', a popular choice for both applied and STEM students. This is likely to be due to its position on the boundary between STEM and applied subjects; different university courses in computer science may have rather different emphases, with some starting from the study of logic and discrete mathematics and others taking a more applied perspective.

Table 4.11 presents the most popular university subjects taken by students who had specialised in multiple areas at A Level. By definition, these students would all have taken at least four A Levels. 'Economics' was the most popular subject among these students, perhaps again because it is a social science touching on several disciplines. The high position of 'Mathematics' is likely to be because many students take further mathematics as a fourth A Level. This would automatically give them two A Levels in STEM subjects, so if they had also taken two subjects from another category they would be classified as multiple specialists.

Table 4.5: Popular university subjects for A Level students with no specialism

Subject	***%***
(N100) Business studies	7.3
(C600) Sports science	7.2
(C800) Psychology	4.0
(L100) Economics	3.3
(W300) Music	2.5
(N200) Management studies	2.5
(K100) Architecture	2.5
(M100) Law by area	2.1
(G400) Computer science	2.0
(N400) Accounting	2.0

Table 4.6: Popular university subjects for A Level students with Applied specialism

Subject	***%***
(N100) Business studies	18.6
(C600) Sports science	10.3
(N200) Management studies	5.3
(N400) Accounting	4.7
(M200) Law by topic	4.5
(M100) Law by area	4.2
(N300) Finance	3.8
(G400) Computer science	2.5
(N500) Marketing	2.3
(L100) Economics	1.9

Table 4.7: Popular university subjects for A Level students with Expressive specialism

Subject	***%***
(W300) Music	12.2
(W200) Design studies	8.2
(W230) Clothing/fashion design	7.4
(W100) Fine art	5.1
(W240) Industrial/product design	5.1
(K100) Architecture	5.0
(W210) Graphic design	5.0
(J930) Audio technology	2.6
(W220) Illustration	2.3
(W640) Photography	2.1

Table 4.8: Popular university subjects for A Level students with Humanities specialism

Subject	***%***
(C800) Psychology	8.0
(V100) History by period	6.6
(Q300) English studies	6.0
(L300) Sociology	4.1
(N100) Business studies	3.6
(L200) Politics	3.4
(M200) Law by topic	3.4
(M100) Law by area	3.3
(L100) Economics	2.8
(P300) Media studies	2.5

Table 4.9: Popular university subjects for A level students with Languages specialism

Subject	***%***
(R100) French studies	29.0
(R900) Others in European languages, literature & related subjects	13.6
(R400) Spanish studies	5.1
(R200) German studies	4.6
(R000) European languages, literature & related subjects	3.9
(R800) European studies	3.8
(R110) French language	3.1
(R300) Italian studies	1.9
(L100) Economics	1.7
(N100) Business studies	1.6

Table 4.10: Popular university subjects for students with STEM specialism

Subject	***%***
(G100) Mathematics	8.6
(C100) Biology	5.5
(F100) Chemistry	5.3
(F300) Physics	4.8
(A100) Pre-clinical medicine	4.2
(H300) Mechanical engineering	4.1
(A300) Clinical medicine	3.5
(B230) Pharmacy	3.4
(G400) Computer science	3.2
(C700) Molecular biology, biophysics & biochemistry	2.7

Table 4.11: Popular university subjects for students with multiple specialisms

Subject	***%***
(L100) Economics	7.9
(G100) Mathematics	6.1
(C800) Psychology	4.4
(C100) Biology	4.0
(V100) History by period	3.8
(M100) Law by area	3.2
(M200) Law by topic	3.2
(R100) French studies	2.9
(N100) Business studies	2.3
(Q300) English studies	2.0

Table 4.12: Popular university subjects: All A level students

Subject	***%***
(C800) Psychology	4.9
(N100) Business studies	3.8
(V100) History by period	3.5
(G100) Mathematics	3.3
(Q300) English studies	3.1
(L100) Economics	2.8
(C600) Sports science	2.4
(M200) Law by topic	2.2
(L300) Sociology	2.2
(C100) Biology	2.2

4.2 Destinations of A Level students: statistical modelling

As stated in Section 2.2, an assessment of the universities and subject areas in which different types of A Level students are over or under represented can be made using the odds ratios derived from multilevel logistic regressions. In the following, the multilevel logistic regression models fitted in this section of the report are described in detail.

Two different specifications of multilevel logistic regression were considered. In the first, presented in Section 4.2.1, the dependent variable was the enrolment in a type of university, whilst the dependent variable in the second, presented in Section 4.2.2, was pursuing a course in a subject area. Although the specifications of the regression models employed to study the two dependent variables were slightly different, in both specifications the independent or explanatory variables included: gender, prior educational institution, socio-economic status, A Level student category, and measures of attainment at A Level.

The inclusion of these variables follows on from Section 3.4 and allowed us to control for several factors when investigating the type of university attended and the subject area studied by A Level students. In this way, for example, we can interpret the odds ratios as an over or under representation of students with a specific level of attainment or subject specialism, given the same conditions in other variables such as socio-demographic characteristics and school type. A detailed breakdown of the dependent and independent variables included in the regression models is presented in Table 4.13.

In modelling students' decisions to enrol at university we have assumed that their choice of subject of study comes before their choice of institution; thus, we have allowed the university type to be influenced by the subject, but not *vice versa*. This is supported by research by Maringe (2006) which found that programme (field of study, courses, majors, course structure and degree organisation) was the most important influence on university choice, whereas career opportunities and ability in a subject had a greater influence on subject choice than course prestige and staff profile.

Table 4.13: Description of the variables included in the multilevel logistic regression models presented in Sections 4.2.1 and 4.2.2

	Name	Description	Range of values	Specification	
				4.2.1	*4.2.2*
Dependent Variables	Candidate enrolled in a type of university	Indicator of university enrolment	Discrete variable: 0 was not enrolled at the university; 1 was enrolled at the university.	✓	
	Candidate pursuing a course in a subject area	Indicator of subject area uptake	Discrete variable: 0 did not take a course in the subject area; 1 took a course in the subject area.		✓
Independent Variables	Gender	Gender of the candidate	Discrete variable: male; female	✓	✓
	Level of deprivation (IDACI)	Candidate level of deprivation based on the IDACI (Income Deprivation Affecting Children Index)	Discrete variable: low, average, high	✓	✓
	Centre type	Type of institution the candidate attended prior to university	Discrete variable: comprehensive; independent; academy; sixth form college; selective; FE college; other	✓	✓
	Student category	A Level subject specialism	Discrete variable: None; Applied; Expressive; Humanities; Languages; STEM; Multiple	✓	✓
	University subject area	University subject area studied	Discrete variable: Architecture, Building and Planning; Biological Sciences; Business and Administrative studies; Creative Arts and Design; Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects; Education; Engineering; European Languages, Literature and related subjects; Historical and Philosophical studies; Law; Linguistics, Classics and related subjects; Mass Communications and Documentation; Mathematical and Computer Sciences; Medicine and Dentistry; Other/Combined; Physical Sciences; Social studies; Subjects allied to Medicine; Technologies; Veterinary Sciences, Agriculture and related subjects	✓	
	A Level score	Average grade across all A Level subjects taken	(Quasi-) continuous variable: 2 represents an average of E; 7 represents an average of A*.		✓
	Overall grade thresholds	Indicator of whether candidate gained an average of C or above, an A or above, across all A Levels	Two discrete variables: 1 if the student achieved an average A Level grade greater than or equal to C/A; 0 otherwise	✓	
	A Level specialism grade thresholds	Indicator of whether candidate gained an average E or above (*i.e.*, passed any A Levels), a C or above, an A or above, in each of the five A Level specialism categories	15 discrete variables: 1 if the student achieved an average A Level grade greater than or equal to each threshold value in each A Level specialism; 0 otherwise.		✓

As the aim of this section is to examine the relationship between university participation and prior school career, the independent variables of major interest were A Level subject specialism and attainment at A Level. The following measures of attainment were used:

a) the average grade of a candidate's A Levels, excluding General Studies (assigning the grades nominal values of A*=7, A=6, B=5, C=4, D=3, E=2; this corresponds to 1/20th of the UCAS points accumulated for each A Level);

b) two variables indicating whether the candidate's average grade (across all A Levels, excluding General Studies) was
    - C or above;
    - A or above.

c) three variables for each of the five A Level subject categories (Applied, Expressive, Humanities, Languages, STEM) indicating whether the candidate's average grade in this category was
    - E or above;
    - C or above;
    - A or above.

The variables within each of b) and c) are not mutually exclusive, so a candidate with an average of an A grade in a particular subject category would satisfy all three of the conditions in c), for example.

Fails (grade U) could not be taken into account in calculating these attainment measures (to provide a correct denominator for the calculation of average grades) because they had previously been removed from the dataset (see Appendix C). However, given that the analysis was restricted to those students with three A Level passes (excluding General Studies) the effect of this should be minimal.

Figure 4.1 shows that the average A Level grade (described in a) above) takes a limited number of values in practice (although we have treated it as continuous in our modelling), because typically students take only three or four A Levels[27]. As such, the average grade variable is mostly confined to whole grades, thirds and quarters. The most frequent average grade was B, and the majority of students scored between a C and an A on average, as also shown in Table 4.14 which gives the breakdown of the discrete attainment variables (described in b) above). The levels are nested, so 'C or above' and 'A or above' are not mutually exclusive, and we infer that 113,280 students (62.5%) had an average grade of at least a C but lower than an A.

[27] Those with fewer A Levels have been excluded from the dataset, as discussed previously.

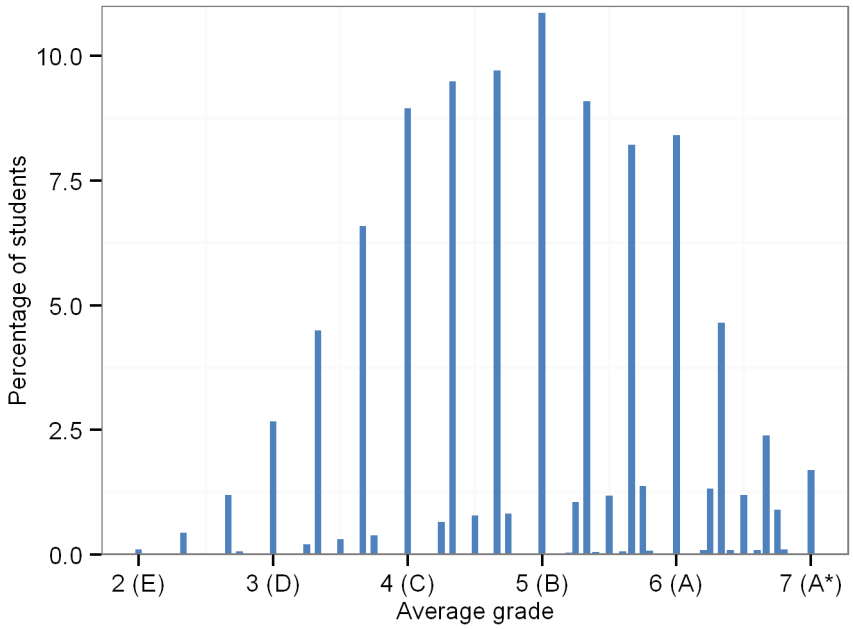


Figure 4.1: Distribution of average A Level grade

Table 4.14: Number and percentage of students with different levels of A Level attainment

Levels of attainment	***Number of students***	***% of all students***
All students (E or above)	181190	100.0
C or above	151210	83.5
A or above	37930	20.9

Results of the estimated regression models are presented in the form of odds ratios. As explained in Section 2.2, an odds ratio represents the factor of increase in the odds of attending a university or studying a subject when the value of a categorical independent variable changes from the baseline to a specified category. An odds ratio greater than 1 indicates an increase in the likelihood of attending the specific university type (or studying a subject), with a greater odds ratio indicating a greater likelihood. Conversely, an odds ratio less than 1 indicates a decrease in the likelihood of attending a university group (or studying a subject), with a smaller odds ratio indicating a smaller likelihood. And, finally, an odds ratio equal to 1 indicates an equal likelihood of attending a university (or studying a subject).

Odds ratios for A Level subject specialism and A Level attainment are reported in the following. Odds ratios for the other independent variables are not reported as they are not the focus of the research. However, it is important to note that their inclusion in the regression models allows interpretation of the odds ratios for attainment and subject specialism accounting for their effect.

4.2.1 Enrolment in a type of university

The formal representation of the regression model fitted in this section is:

$$\log\left(\frac{p_{ij}}{1-p_{ij}}\right) = \beta_0 + \beta_1 Gender_{ij} + \beta_2 Centre\ type_j + \beta_3 Deprivation_{ij} + \beta_4\ A\ level\ specialism_{ij} + \beta_5\ University\ subject\ area_{ij} + \beta_6\ C\ or\ above_{ij} + \beta_7\ A\ or\ above_{ij} + u_j$$

where p_{ij} is the probability of student i in prior institution j attending a certain type of HE institution; β_0 to β_7 are the regression coefficients and u_j is a random variable at the prior institution level which follows a normal distribution with mean zero.

The rationale for this model is that university participation, in terms of the type of institution attended, might be expected to depend on a student's general academic ability (as measured by overall A Level grade), and the subject area of study (as some subject areas, such as 'Medicine and Dentistry', are predominantly offered in certain university groups). A student's broad choice of A Levels (specialism, as represented by category) might also have an influence on the type of institution they attend, due to differing admission policies.

The inclusion of the dummy variables for measuring overall A Level attainment allow the interpretation of the coefficient for the variable 'C or above' as the likelihood of attending a specific university group given by an average attainment above C, compared to the effect of taking the A level at all (and scoring any grade). Likewise, the coefficient of the variable 'A or above' can be interpreted as the likelihood of attending a specific university group with an overall attainment above A, over and above the likelihood provided by an overall attainment above C.

Table 4.15 shows the estimates of the odds ratios for the two independent variables of interest, 'C or above' and 'A or above', measuring the prior overall attainment at A Level.

Table 4.15: Odds ratios for average A Level attainment

University mission group	***Average attainment at A Level***	
	C or above (with respect to all A Level students)	***A or above (with respect to 'C or above')***
Russell Group	**37.81**	**7.92**
1994 Group	**7.98**	**0.77**
University Alliance	**0.87**	**0.10**
Million+	**0.24**	**0.11**
Other	0.97	**0.37**

Note: Significant estimates at the 5% level are in bold.

Nine out of ten odds ratios were significant at the 5% level, leading to the conclusion that, as expected, the average attainment at A Level was a significant determinant of the institution group attended by the students.

The first column in Table 4.15 shows the odds ratios of students graded C or above overall. With other conditions held fixed, that is controlling for all variables shown in Table 4.13, students having an average attainment of C or above were much more likely to enrol in a Russell Group or 1994 Group university than students with an average attainment below C. The odds ratio for the Russell Group was particularly large, 37.5, showing that students with an overall attainment above C were far more likely to attend a university in this group.

Conversely, an average attainment above C reduced the likelihood of students of attending HE institutes not in the Russell or 1994 mission groups.

The second column of the table refers to students with an average grade at A Level of A or above: these results should be interpreted as the odds ratios on top of those shown by the previous column, which referred to overall attainment of C or above. It is clear that students attaining an average grade of A or above were much more likely than students with C or above to attend a Russell Group university and less likely to enrol at universities in other groups; however, students with an A or above were still more likely than A Level students in general to study at 1994 Group universities. For those students with an overall level of attainment above A, with respect to those below A, the likelihood of attending a University Alliance or Million+ institution was particularly low.

Table 4.16 shows the odds ratios of the A Level specialism category with respect to the enrolment probability in each university group. It is quite clear that the subject specialism at A Level did affect the likelihood of being enrolled in a certain HE mission group. More specifically, specialising in STEM or multiple areas greatly improved the likelihood of studying in a Russell Group university and reduced the chance of enrolling in other HE institutes. Students that had specialised in humanities or languages were also more likely to attend universities in the Russell Group, but the size of the association was smaller than in the former case. Conversely, students specialising in applied and expressive subjects at A Level were less likely to attend Russell and 1994 Group universities. Finally, the likelihood of attending Million+ and University Alliance universities was higher for specialists in applied and expressive A Level subjects than for those with no specialism.

Table 4.16: Odds ratios for the A Level specialism category, in comparison to no specialism

University Group	***A Level specialism category***					
	Applied	***Expressive***	***Humanities***	***Languages***	***STEM***	***Multiple***
Russell Group	**0.67**	**0.61**	**1.12**	**1.47**	**2.19**	**2.75**
1994 Group	**0.77**	**0.82**	**1.08**	0.91	1.02	1.01
University Alliance	1.06	**1.14**	**0.89**	**0.63**	**0.69**	**0.54**
Million+	**1.11**	1.08	1.03	0.96	**0.64**	**0.64**
Other	**0.92**	0.98	1.00	1.00	**0.91**	**0.78**

Note: Significant estimates at the 5% level are in bold.

4.2.2 Subject area at university

The formal representation of the regression models fitted in this section is:

$$\log\left(\frac{p_{ij}}{1-p_{ij}}\right) = \beta_0 + \beta_1 Gender_{ij} + \beta_2 Centre\ type_j + \beta_3 Deprivation_{ij} + \beta_4\ A\ level\ specialism_{ij} + \beta_5 A\ Level\ score_{ij} + \sum_{k=1}^{5}\sum_{l=1}^{3}\gamma_{kl} ALevel\ specialism\ threshold_{ijkl} + u_j$$

where p_{ij} is the probability of student i in prior institution j studying a course in a subject area, β_0 to β_5 and γ_{11} to γ_{53} are the regression coefficients and u_j is a random variable at the prior institution level which follows a normal distribution with mean zero. There are subject area threshold variables and associated coefficients for each subject category k and grade threshold l.

The rationale for this model is that the subject studied at university might be expected to depend on a student's general academic ability (as measured by overall A Level score), their broad choice of A Levels (as represented by specialism category), whether they have taken A Levels in particular subject areas (represented by the 'E or above' dummy variables) and their A Level grades in particular subject areas (represented by the 'C or above' and 'A or above' dummy variables).

Table 4.17 presents the odds ratios for following a course in a specific subject area for students in each A Level subject category in comparison to those with no specialism, and shows that subject choices at A Level had a significant effect on the likelihood of going on to study in a particular subject area at university, as might be expected. For example, STEM specialists at A Level were significantly more likely than average to study STEM subjects at university, such as 'Biological Sciences', 'Physical Sciences', 'Engineering', 'Mathematical and Computer Sciences', 'Subjects allied to Medicine' and (particularly markedly) 'Medicine and Dentistry'. Conversely, students who had specialised in humanities subjects at A Level were more likely to pursue courses in 'Historical and Philosophical Studies', 'Law', 'Linguistics, Classics and related subjects' and 'Social Studies'.

Students who specialised in multiple areas at A Level were significantly more likely to study 'Engineering', 'European Languages, Literature and related subjects', 'Law', 'Mathematical and Computer Sciences', and especially 'Medicine and Dentistry'. The multiple specialists who went on to study 'Medicine and Dentistry' courses (of whom there were fewer than 100) were investigated due to the very high odds ratio: in most cases they studied two humanities subjects as well as biology and chemistry. The most popular humanities A Levels taken by these students were history and English literature.

Most university subject areas were associated with higher odds in only one A Level specialism (with the addition of students with multiple specialisms in some cases), but 'Architecture, Building and Planning', 'Law' and 'Mathematical and Computer Sciences' were associated with two individual specialisms. Interestingly these subject areas all span the vocational/academic divide, and the mix may reflect the variety of courses available in these subject areas. One particular result of note is that students who specialised in applied subjects at A Level (which includes law) were more likely than average to study 'Law' at university, despite reports that admissions tutors at prestigious universities prefer students who have not previously studied law so they can start their university course with a 'blank canvas' (Rose, 2011; Fazackerly and Chant, 2008). Overall, 42% of entrants to courses in the 'Law' subject area had an A Level in law. However, admissions policies vary between institutions and, possibly as a consequence, 28% of entrants to law courses at Russell Group universities had law A Level, compared to 54% at Million+ universities; this may also be linked to provision and uptake of the subject in different types of schools and colleges.

Table 4.17: Odds ratios for specialism category, in comparison to no specialism

University subject area	***A Level specialism category***					
	Applied	***Expressive***	***Humanities***	***Languages***	***STEM***	***Multiple***
Architecture, Building and Planning	**1.63**	**1.99**	1.11	**0.25**	0.92	1.24
Biological Sciences	1.04	**0.20**	**0.93**	**0.24**	**1.29**	1.05
Business and Administrative Studies	**3.04**	**0.74**	1.04	**0.76**	**0.56**	0.93
Creative Arts and Design	**0.29**	**2.24**	**0.58**	**0.28**	**0.19**	**0.71**
Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects	**0.13**	**0.00**	1.04	**1.72**	**0.14**	0.86
Education	**1.18**	**0.68**	0.93	0.73	**0.30**	0.75
Engineering	**0.66**	0.99	**0.38**	**0.17**	**4.58**	**1.67**
European Languages, Literature and related subjects	**0.17**	**0.17**	**0.44**	**4.39**	**0.15**	**1.48**
Historical and Philosophical Studies	**0.51**	**0.36**	**1.95**	**0.35**	**0.33**	1.01
Law	**2.17**	**0.29**	**2.16**	0.82	**0.69**	**2.15**
Linguistics, Classics and related subjects	**0.48**	**0.34**	**2.00**	**0.44**	**0.27**	0.96
Mass Communications and Documentation	**0.38**	**0.39**	**1.16**	**0.12**	**0.16**	**0.44**
Mathematical and Computer Sciences	**1.63**	0.88	**0.75**	**0.49**	**2.30**	**2.02**
Medicine and Dentistry	0.99	0.49	0.72	0.09	**49.54**	**15.59**
Physical Sciences	**0.39**	**0.17**	**0.81**	**0.29**	**1.95**	1.09
Social Studies	0.95	**0.29**	**1.48**	**0.46**	**0.49**	1.06
Subjects allied to Medicine	**0.77**	**0.40**	**0.63**	**0.35**	**2.12**	0.88
Technologies	**0.55**	**1.83**	**0.48**	0.38	0.99	0.67
Veterinary Sciences, Agriculture and related subjects	0.76	**0.55**	**0.53**	**0.28**	**1.38**	**0.41**
Other/Combined	**0.78**	**0.57**	**1.12**	**0.84**	**0.56**	0.93

Note: Significant estimates at the 5% level are in bold.

Table 4.18 shows the effect of increasing the overall average A Level grade by one (for example moving from an average of D to C, or B to A) on the chances of studying a particular course. A subject area with an odds ratio greater than 1 denotes that students with a higher average A Level grade were more likely than average to study in this area. Subject areas associated with higher than average A Level grades were ‘Medicine and Dentistry’, ‘Linguistics, Classics and related subjects’, ‘Historical and Philosophical Studies’, ‘Law’ and ‘Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects’. ‘Education’, ‘Business and Administrative Studies’ and ‘Technologies’ (all of which are vocational areas) were associated with lower than average A Level grades. Despite the concentration of ‘European Languages, Literature and related subjects’ courses in Russell Group universities (as shown in Figure 3.1), which might be expected to have higher admissions criteria, there was no significant effect for overall A Level score for this subject area. This may be because grades in particular A Levels, such as languages, were of more importance.

Table 4.18: Odds ratios for overall A Level score (increase of one grade)

University subject area	*Odds ratio*
Architecture, Building and Planning	**0.70**
Biological Sciences	**0.91**
Business and Administrative Studies	**0.60**
Creative Arts and Design	**0.74**
Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects	1.12
Education	**0.49**
Engineering	**0.87**
European Languages, Literature and related subjects	1.00
Historical and Philosophical Studies	**1.31**
Law	**1.17**
Linguistics, Classics and related subjects	**1.46**
Mass Communications and Documentation	**0.64**
Mathematical and Computer Sciences	**0.86**
Medicine and Dentistry	**1.87**
Physical Sciences	1.01
Social Studies	**0.94**
Subjects allied to Medicine	**0.86**
Technologies	**0.61**
Veterinary Sciences, Agriculture and related subjects	**0.75**
Other/Combined	**1.14**

Note: Significant estimates at the 5% level are in bold.

Table 4.19 shows the odds ratios associated with achieving threshold grades in each of the five A Level subject categories, for each university subject area. The 'E or above' variables (denoted as 'E+' in the table for brevity) represent the change in the odds associated with having an A Level pass in that subject area (at any grade). As with the overall score dummy variables in the model described in Section 4.2.1, the 'C or above' and 'A or above' variables show the extra effect of having these grades, compared to the previous attainment category. For example, a student was 4.24 times more likely than average to study 'Architecture, Building and Planning' at university if they had an A level in an expressive subject (at any grade). Scoring an average of C or above in their expressive subjects at A Level was associated with a further factor of 2.23 times (that is, 9.44 times more likely than not having an A Level in this subject area at all). Finally, scoring an average of A or above was associated with a further factor of 2.60 times, compared to scoring an average of C or above. This means that students with an A or above in an expressive subject were 24.50 times more likely to study 'Architecture, Building and Planning' than if they did not take (or pass) any expressive A Levels.

For some university subject areas, there was not a strong association with particular A Level subject categories or grades (after overall score and specialism were controlled for). These tended to be more vocational areas (such as 'Engineering' and 'Technologies'), where A Level students were in any case underrepresented (see Section 3.3), and also for 'Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects' where students might not have studied directly relevant subjects at A Level (and which might encompass a variety of subject areas).

Otherwise there was a correspondence between the university subject area and A Level subject category in terms of the sensitivity to grade. For example, students were more likely to follow a course in ‘Creative Arts and Design’ if they achieved good grades in expressive subjects at A Level, but those with A Levels in other subject categories, especially at higher grades, were less likely to pursue a course in this area.

As expected, the sensitivity to A Level grade (as measured by the ‘C or above’ and ‘A or above’ odds ratios) was particularly marked for courses in ‘Medicine and Dentistry’, which are highly competitive, concentrated in Russell Group universities (as shown in Figure 3.1) and have stringent entry requirements. Having an A Level in one or more STEM subjects did not in itself give rise to a higher probability of studying ‘Medicine and Dentistry’ at university, but having an average of an A or above increased the odds by 22 times compared to not having a STEM A Level at all. The highest increase in odds was found for ‘European Languages, Literature and related subjects’ courses. Having an A Level in one or more languages increased the odds of studying a course in this area by 47 times, and scoring an average of A or above in language A Levels increased the odds by a further factor of 7 to 330 times.

Table 4.19: Odds ratios for subject category grade thresholds (ratios for 'E+' reported in comparison to having no A Level passes in the respective subject area; ratios for 'C+' and 'A+' reported with respect to the previous column)

University subject area	***Applied***			***Expressive***			***Humanities***			***Languages***			***STEM***		
	E+	***C+***	***A+***	***E+***	***C+***	***A+***	***E+***	***C+***	***A+***	***E+***	***C+***	***A+***	***E+***	***C+***	***A+***
Architecture, Building and Planning	**1.52**	1.14	**0.74**	**4.24**	**2.23**	**2.60**	**1.22**	1.00	0.93	1.24	0.88	1.26	**2.34**	**1.19**	1.13
Biological Sciences	**1.25**	1.07	**1.11**	**0.50**	1.06	0.94	0.98	**1.22**	**1.07**	**0.71**	0.94	**0.78**	**2.10**	**1.07**	**0.60**
Business and Administrative Studies	**2.36**	**2.11**	**1.71**	**0.88**	**1.18**	1.05	**1.28**	1.05	**0.82**	**1.27**	0.97	**0.77**	0.98	**1.44**	1.02
Creative Arts and Design	**0.37**	0.92	**0.85**	**4.02**	**1.98**	**2.03**	**0.53**	**1.09**	**0.85**	**0.69**	0.94	0.85	**0.38**	**0.84**	0.89
Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects	**0.31**	1.07	**2.04**	**0.45**	1.58	1.07	0.68	**1.82**	**0.57**	0.65	**3.08**	1.21	**0.48**	**1.73**	**0.47**
Education	**0.71**	**1.71**	**1.26**	**0.73**	**1.39**	0.92	1.10	**1.24**	**0.67**	0.93	**0.75**	**0.43**	**0.60**	**1.26**	**0.69**
Engineering	1.09	**0.74**	1.15	**2.06**	1.10	0.96	**0.78**	**0.64**	**0.74**	1.13	0.72	0.99	**2.11**	**1.13**	1.00
European Languages, Literature and related subjects	**0.33**	1.09	1.07	**0.39**	1.42	**0.69**	**0.61**	1.14	**0.67**	**47.06**	**3.98**	**1.76**	**0.43**	1.29	**0.70**
Historical and Philosophical Studies	**0.51**	**0.75**	0.87	**0.66**	**0.79**	**1.42**	**10.94**	**1.20**	**1.34**	0.86	0.83	0.87	**0.89**	**0.69**	**0.87**
Law	**2.16**	**1.43**	**1.57**	**0.51**	0.92	**0.71**	**2.63**	0.96	**1.24**	1.25	1.15	**1.24**	0.96	0.93	**1.19**
Linguistics, Classics and related subjects	**0.59**	**0.69**	**0.58**	1.10	**0.76**	**0.77**	**11.15**	**1.35**	**1.53**	**1.52**	**0.72**	**0.85**	**0.82**	**0.59**	**0.81**
Mass Communications and Documentation	**0.68**	**0.80**	**0.71**	**1.29**	**0.84**	1.01	1.12	**1.80**	**0.80**	**0.64**	0.75	0.75	**0.26**	1.09	**0.48**
Mathematical and Computer Sciences	**2.29**	**0.61**	**0.75**	**1.61**	**0.60**	**0.57**	**1.67**	**0.59**	**0.53**	1.20	0.96	**0.81**	**4.27**	**1.80**	**2.21**
Medicine and Dentistry	0.59	0.39	1.68	0.48	0.49	1.45	0.74	0.55	**1.83**	1.06	0.68	**1.35**	0.58	**4.50**	**4.93**
Physical Sciences	**0.61**	0.86	**0.70**	**0.60**	0.95	0.87	1.01	1.00	**0.83**	0.83	0.88	**0.72**	**2.68**	**1.26**	**0.87**
Social Studies	**0.88**	0.96	1.05	**0.50**	0.97	0.90	**4.95**	**1.24**	**1.24**	0.93	0.84	**0.87**	**0.74**	**1.34**	**1.50**
Subjects allied to Medicine	1.04	1.10	0.99	**0.49**	1.06	0.88	0.97	0.95	**0.83**	**0.57**	1.11	**0.76**	**2.12**	**1.58**	**0.46**
Technologies	**0.57**	1.08	1.48	**3.60**	1.17	0.97	**0.58**	1.27	**0.58**	**0.43**	1.40	0.78	**0.70**	**1.40**	0.73
Veterinary Sciences, Agriculture and related subjects	1.03	0.85	0.91	1.07	1.04	0.80	**1.27**	**0.66**	**0.60**	0.81	**0.51**	0.98	**2.63**	**0.84**	**1.44**
Other/Combined	**0.85**	**0.84**	**0.85**	0.90	**0.88**	**0.84**	1.09	**1.13**	**0.93**	**1.31**	**1.26**	1.01	**0.84**	**0.81**	**1.30**

Note: Significant estimates at the 5% level are in bold.

5. Conclusions and discussion

As mentioned in the introduction to this work, in the current educational climate it is crucial to better understand how level 3 qualifications, both academic and vocational, are used by students to progress to higher education. This report aimed to provide quantitative evidence to show how different types of qualifications and combinations of qualifications channelled learners in particular directions.

We considered HESA data gathered at individual level which covers all full-time, first year undergraduates aged 17–19, domiciled in England, studying at UK universities in the 2011/12 academic year (250175 students). Considering data on undergraduates does not allow us to study the determinants of the probability of progressing to HE, but enables us to focus on university participation in terms of institution attended and subject chosen for the students who did progress. Together with socio-demographic characteristics, the data used throughout the report includes information on the students' qualifications prior to starting the course, the university subject and the HE mission group institution where the student was studying.

Preliminary empirical evidence showed that the level of socio-economic deprivation of the area of residence and the type of the prior institution students had attended could influence the qualifications they had taken at level 3, as well as university participation. For this reason, together with simple descriptive statistics which show the popularity of qualifications in relation to the university participation, more sophisticated statistical analyses were carried out to study the likelihood of students with different types of qualifications and combinations of these qualifications to study in specific HE institutions and subjects, once students' characteristics had been accounted for.

Firstly, we employed multilevel logistic regressions to assess in which universities the different prior qualifications or programmes of study were over or under represented. Secondly, using the same method and considering that A Levels are the passport to progress to higher education, we focussed on students with at least three A Levels in order to study how their A Level attainment and subject specialism could influence university destination.

The key results of the analyses presented in this report are summarised and discussed below, with a focus on the following two issues:

- differences in higher education institutions by educational background (prior qualifications and subjects where appropriate);
- differences in university subject area by educational background.

Progression to higher education with different prior qualifications

Young people progressing to higher education hold a wide range of qualifications and combinations of qualifications (see, for example, the HESA website[28] for a list of all available prior qualifications among accepted students in the 2011/12 academic year). The vast majority of learners at level 3 still take academic qualifications such as AS/A Levels in schools or colleges (*e.g.* DfE, 2013a). However, a growing proportion of learners now enter

[28] http://www.hesa.ac.uk/component/option,com_studrec/task,show_file/Itemid,233/mnl,11051/href,a%5E_%5Equaltype.html

higher education with alternative qualifications. For example, AS/A Levels are occasionally supplemented with or replaced by other academic qualifications such as Pre-U qualifications (principal subjects, short courses or GPR), the International Baccalaureate or the Extended Project. And, recently, there has been an increase of learners at level 3 taking more applied or vocational qualifications such as Applied AS/A Levels, Advanced Diplomas, OCR Nationals and, particularly, BTECs.

The current research showed that prior qualifications, and combinations of prior qualifications, are represented in different proportions in higher education and particularly in the different institution types and subjects.

Academic qualifications

AS and A Levels are the most popular mainstream qualifications held by undergraduates at higher education institutions. In fact, already in the academic year 2004/05 the vast majority of university entrants (almost 81%) held AS/A Level qualifications (Connor *et al.*, 2006) and our research showed that just below 86% of the students starting in 2011/12 did so as well. However, the percentage of full-time entrants holding A Levels only has been decreasing in the last few years (*e.g.* UCAS, 2012) and, as shown in this research, it reached 28% in 2011/12.

The highest percentages of students with A Levels were in universities of the Russell Group, where high A Level grades usually dominate entry requirements. Furthermore, students with other academic qualifications (*e.g.* Pre-U, IB, Asset Languages or Free Standing Maths) were also more likely to go to Russell Group or 1994 Group universities than to other types of universities. Previous research (HESA, 2011) showed, however, that students with an IB diploma were more likely than A Level students to study at high ranking institutions, in fact, proportion wise, more than double the number of IB entrants attended the top 20 higher education institutions[29] compared with A Level entrants.

Having an Extended Project qualification or a Pre-U GPR qualification alongside AS/A Levels significantly increased the probability of attending a university in the Russell or 1994 groups. These qualifications, which require research and autonomous working, have been praised by universities, especially competitive ones, as they allow developing the independent research skills needed for undergraduate study. It is therefore not surprising that they provide 'better' access to competitive universities.

Regarding the subject of study, the highest percentages of students with A Levels were in subject areas related to languages, 'Historical and Philosophical Studies', 'Medicine and Dentistry' and 'Physical Sciences'. This finding was supported, for example, by research carried out by Connor *et al. (*2006), who found that A Levels were over-represented in the humanities (history, philosophy, linguistics, classics, languages, etc.) and also in physical science, law and social studies. Similarly, Hoelscher *et al.* (2008) reported that the likelihood of someone with a traditional academic background (*e.g.* A Levels) studying 'Medicine and Dentistry' was more than 25 times higher than that for a student with other types of qualifications.

Similarly to A Level students, those holding Pre-U (principal subject) qualifications or an IB diploma were more likely to study languages, 'Historical and Philosophical Studies', 'Linguistics, Classics and related subjects' and 'Social Studies', and less likely than average to study science subjects, with the exception of 'Medicine and Dentistry'. In fact, HESA (2011) reported that IB entrants were twice as likely to study 'Medicine and Dentistry' as A

[29] For the purpose of the HESA (2011) report, a top-20 list of universities was created by combining the top 16 higher education institutions from two publicly available league tables: the *University Guide 2011*, published by The Guardian, and the *University League Table 2011*, published by The Complete University.

Level entrants. IB and Pre-U students were particularly unlikely to study 'Creative Arts & Design' or 'Mathematical and Computer Sciences'. The university subject choices of these students may reflect patterns of uptake or provision of Pre-U or IB subjects in schools.

Holding an Extended Project qualification alongside A Levels increased the probability of studying 'Medicine and Dentistry'. It could be the case that in competitive courses such as the ones in this subject area, the Extended Project is being used to differentiate among top performing candidates at A Level. These students were also more likely than students with A Levels only to study a degree in the following subject areas: 'European Languages, Literature and related subjects', 'Historical and Philosophical studies', 'Linguistics, Classics and related subjects', 'Law', 'Physical Sciences' and 'Veterinary Sciences, Agriculture and related subjects'.

Vocational qualifications

Previous research by Connor *et al*. (2006) showed that there was an uneven distribution of level 3 vocationally qualified entrants to full-time degree courses across higher education institutions and they represented a relatively small proportion of the overall intake. The latter seems to be changing, with percentages of university students following vocational and mixed programmes of study growing in the last few years (see, for example, Hayward and Hoelscher (2011)).

BTEC qualifications, particularly the BTEC Diplomas, have become valued and respected qualifications and are a popular option within further and higher education (HEFCE, 2007). In fact, the current research has shown that BTECs are the second most popular qualification held by undergraduates at higher education institutions in the UK. However, as for AS/A Levels, its popularity varied by type of institution and subject.

Regarding the type of institution, our research showed that the highest percentages of students with BTEC qualifications were in universities of the Million+ Group, followed by universities in the University Alliance. As expected, the lowest percentages of students with these qualifications were in universities of the Russell Group. Those findings support previous studies by Schwartz (2004) and Hoelscher *et al*. (2008), among others, who had shown that students with non-traditional qualifications typically progressed to post-1992 institutions and colleges of higher education. This though might be partly related to the type of courses offered by each group of institutions.

Regarding the subject of study, the distribution of subjects studied by students with BTECs is markedly different from the average. Those students were substantially more likely to have opted for courses in areas such as 'Creative Arts and Design' and 'Biological Sciences', and much less likely to study 'Historical and Philosophical Studies', 'Linguistics, Classics and related subjects', 'Medicine and Dentistry', 'Physical Sciences' and 'Social Studies'. These results, again, support findings from previous research into the progression to HE of vocational students (*e.g.* Purcell *et al.*, 2008; Hoelscher *et al*., 2008). It should be noted that, as pointed out previously by HEFCE (2007) and corroborated by the outcomes of our research, the most popular university subject areas for students with BTECs were closely aligned to the subject of the BTEC, and the strength of the association was greater for the Diploma and Certificate, which carry more weight than the Award.

Similarly to students holding BTEC qualifications and in line with previous research (*e.g.* Connor *et al.*, 2006) students with other vocational qualifications (*e.g.* OCR Nationals and Double AS/A Levels) were found to be more likely to attend a University Alliance or Million+ institution than other types of institutions.

Students with Double A/AS Levels were more likely than average to study 'Education' and 'Subjects allied to Medicine' at university, probably due to the nature of specific courses offered at Double A/AS Level. However, students with OCR Nationals were not very different

from those taking A Levels regarding their subject choice at university. This might be partly because they were likely to have also taken A Levels (as shown in this research the majority of students with OCR National Certificates or Diplomas held AS/A Levels).

The results in this research support the hypothesis that students with more academic backgrounds are more likely to go to universities in the Russell and 1994 groups and those holding vocational qualifications are more likely to study in other types of universities (*e.g.* universities in the University Alliance or in the Million+ Group). It should be noted that one reason for this could be that the more applied/vocational subjects are over-represented in some types of institutions and, for example, candidates with vocational backgrounds are more attracted to those types of subjects and therefore their university choices are determined somehow by their subject choices. In fact, vocational students, who usually come from average or high deprived backgrounds, might be taking applied or more vocational subjects (*e.g.* 'Business and Administrative Studies, 'Law' and 'Mathematics and Computer Science', or 'Subjects allied to Medicine') at higher education to allow them to quickly join the labour market.

This research has not looked at work based learning (WBL) and the progression of learners with WBL qualifications, for example apprenticeships, to higher education. One of the reasons for this relates to the fact that quantitative information or uptake data on these types of qualifications is hard to come by and in many cases incomplete (Seddon, 2005).

Mixed economy of qualifications

In line with results for students following a vocational pathway, students with a mixed economy of qualifications prior to entry at university were less likely to study in a Russell Group university or in a university member of the 1994 Group than those who held only academic qualifications. However, it is worth noting that, in the Russell Group universities, the percentage of students following a mixed programme of study was higher than the percentage of students following a vocational one. On the other hand, these students were over-represented in institutions of the University Alliance. Particularly, this research showed that having an OCR National or a BTEC qualification alongside A Levels decreased the likelihood of attending the more competitive universities (Russell Group and 1994 Group) but increased the likelihood of attending universities in the Million+ Group and in the University Alliance.

Regarding subject of study at university, students with a mixture of qualifications were more likely to enrol on courses in 'Business and Administrative Studies', 'Biological Sciences', 'Education', 'Mass Communications and Documentation', 'Technologies' and 'Mathematical and Computer Sciences' and less likely on courses in 'Historical and Philosophical Studies', 'Physical Sciences' or languages. The favoured subject areas by students following a mixed pathway to higher education were also favoured by students with BTECs and OCR Nationals only so it seems that when a student has a combination of academic and vocational qualifications, the latter might be driving the choice of subject at university.

Although the focus of the research was on the distribution of students across higher education institutions and subjects, the research briefly investigated the types of degrees students with different prior educational backgrounds were enrolled on. A brief discussion of the findings in this area is given below.

There is not much literature to date regarding the type of higher education courses that students with different types of qualifications pursue. This research showed that those with academic qualifications were most likely to study at first degree level, whilst students taking vocational qualifications were more likely to enrol on foundation degrees or HND/HNC courses. However, Faithorn (2005) had previously showed that around 60-70% of vocational

learners opted for first degree study rather than enrol on HND/HNC courses or foundation degrees. This might indicate that, since 2005 there has been a shift in the type of courses vocational students access.

According to research by Haynes and Richardson (2011) higher education institutions believed that applicants with a diploma would be recruited to honours degrees rather than foundation degrees. This research shows, however, that diploma applicants were particularly likely to study at HND/HNC level. It should be noted that upon finishing the HND/HNC course, students might be able to progress to an honours degree.

Students with Key Skill level 3/4 qualifications were more likely than students with other vocational qualifications to progress to a first degree, but this was probably because these qualifications were frequently taken in combination with A/AS Levels.

Finally, regarding the subject balance at university (that is, whether the higher education course was a single subject or a combination of subjects), students with Pre-U and IB qualifications had higher than average percentages of joint honours. For IB students, the broader focus of their sixth form study may have encouraged them to pursue more than one subject at degree level. Students with the more vocational qualifications, particularly BTEC Diplomas, were more likely than average to study a single subject at university. This is not totally unexpected since those students usually specialise in one area at level 3.

Progression to higher education with A Levels only

Section 3 has shown that the majority of English undergraduates aged 17–19, studying in a UK university had taken A Levels. Focusing on the group of pupils who relied on their A Levels as a passport to university, taking at least three A Levels (72% of all students), allowed us to consider in further detail the factors determining the university participation in terms of HE mission group where students were enrolled and the subject area of study at university, and in particular look at the effect of A Level subject choice and attainment.

It has frequently been argued (*e.g.* Purcell *et al.*, 2008; Fazackerly and Chant, 2008; Russell Group, 2012) that careful choice of subjects post-16 is crucial to avoid students inadvertently closing their options down prematurely. Our research supports that view, as we have found that subject choice has a significant effect not only on the subject area of study but on the institution studied at.

It should be noted though that the existing A Level system allows learners to drop a subject after one year (perhaps the one in which they performed least well), so affording a degree of flexibility and allowing deferral of final A Level subject choice until shortly before applying for university. However, this will not be possible when the A Level reverts to a linear form, so it will be even more crucial that students choose their subjects wisely at age 16.

A Level subject and the subject choice at university

It should not be surprising that A Level subject choice is linked to the subject of study at university, as if a student is interested and able enough in a subject to pursue it at higher education it is probable that their interest and ability was stimulated and developed by earlier study in that subject or a related area (where this was offered). Also the admissions criteria for many university courses stipulate that certain A Levels are required to study a certain subject; for example entry to a Physics course typically requires A Level Physics, and often Mathematics as well. However, some university subject areas are not so closely linked to subjects commonly offered at A Level, for example ‘Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects’. Vidal Rodeiro and Sutch (2013)

presented the ten most common combinations of A Levels held by students in each subject area, and the highest ranking of these were usually very closely related to the subject of study at university.

We have found that the strongest link between A Level subject choice and university subject area is in 'Medicine and Dentistry', where the specialist knowledge required means that students need to have specialised in science (or multiple areas including science) at A Level, taking at least two STEM subjects. Some university subject areas were linked to several fields at A Level, for example 'Architecture, Building and Planning' which attracted students who had previously specialised in applied and expressive areas. These university subject areas span the vocational/academic divide, and the mixture of backgrounds may reflect the variety of courses available in these subject areas. One notable result was that students in the 'Law' area were likely to have specialised in either applied or humanities subjects at A Level, reflecting the mixed views on the status of Law A Level (which has been classified as an applied subject).

Those students who had not specialised in a particular field (for example choosing three A Levels in different categories) were more likely to study in more vocational areas at university, such as 'Business and Administrative Studies' and 'Creative Arts and Design'. These students may have benefited from taking a traditional academic subject to support their interest in applied or expressive subjects, for example, taking Mathematics or Economics in addition to Business Studies A Level.

Some students, whom we have termed multiple specialists, took a broad and yet still deep curriculum, studying two A Levels in each of two subject areas. They were most likely to study economics or mathematics at university. The popularity of mathematics among this group is probably due to the special case of Further Mathematics A Level which is almost invariably taken alongside Maths: if a student took Maths, Further Maths and two non-science subjects they would be classified as a multiple specialist.

A Level subject and the type of university

The statistical analyses carried out in this research revealed that there is a relationship between A Level subject specialism and the type of university attended. In particular, it is quite interesting to note that specialising in STEM or multiple subjects greatly increased the likelihood of studying in a Russell Group university. This also holds for languages and humanities, even if in this case, the magnitude of the association is smaller.

It is also important to mention that applied and expressive A Level specialisms reduced the likelihood of attending a Russell Group university. Students taking A Levels in these subjects were more likely to study in a University Alliance or Million+ institution. Humanities students were quite widespread across different types of institution, but together with the mentioned positive association with Russell Group, they seemed to be positively linked to 1994 Group and negatively associated with University Alliance, even if the magnitude of the association was barely significant.

These results contributed to the debate about the crucial role of subject choice, and not only the type of qualification taken, at age 16 in the future career opportunities of young students, because these associations hold also when considering other conditions, such as level of attainment and prior centre attended, fixed. There is a need for considering that, although membership of the Russell Group is not necessarily important in determining the quality of undergraduates' university experience, empirical evidence proved that obtaining a degree from a Russell Group institution leads to a higher wage return in the labour market (see Hussain *et al.* (2009) and Chevalier and Conlon (2003)). In other words, even if our study is

not exhaustive[30], there is some indication that A Level choice might be able to indirectly influence students' future career opportunities and their social and economic conditions after their university studies.

Attainment at A Level and the subject choice at university

We found that attainment at A Level, as measured by both average grade and grades in five subject areas, did have a significant effect on the subject area of study. The greatest effect of overall grade was observed for 'Medicine and Dentistry', which is a particularly competitive area as already discussed, and 'Linguistics, Classics and related subjects'. However, somewhat surprisingly we did not observe a similar effect for overall grade in 'European Languages, Literature and related subjects', courses which are offered predominantly by Russell Group universities; instead, attainment in language A Levels in particular was important. As with the overall choice of A Levels, the areas in which students' performance had a significant effect on university subject area were closely linked to the university subject area. For example, students were more likely to study 'Historical and Philosophical Studies' if they had achieved higher grades in humanities subjects at A Level. Sensitivity to grades in specific subject areas was most marked in 'Medicine and Dentistry' (focusing particularly on STEM subjects).

Our research has confirmed that subject choice at university is linked to attainment at A Level more generally as well as attainment in specific subject areas. Variation in admissions offers across subject areas is likely to account for much of this relationship, but it may also be the case that more academically able students favour certain subject areas.

Attainment at A Level and the type of university

Much of the literature on progression to higher education does not focus on attainment at A Level *per se*, but uses it as a controlling variable when investigating for other factors, such as socio-economic status (Gayle *et al*., 2002; Chowdry *et al*., 2013), vocational qualifications (Hoelscher *et al*. 2008) or school background (Sutton Trust, 2009). There is thus an acknowledgement that attainment does have a strong effect, and there is widespread knowledge that Oxbridge and other prestigious universities (most of which are in the Russell Group) have stringent entry criteria. Information on average prior attainment of students at individual institutions is available to applicants and others through the publication of league tables and supporting data[31], from which it is clear that Russell Group universities admitted students with highest prior attainment on average and Million+ institutions with the lowest. Vidal Rodeiro and Sutch (2013) found that students at Russell Group universities had the highest average A Level grades, followed by the 1994 Group, University Alliance and Million+ groupings. Our research has confirmed that after controlling for other factors, students with an average grade of C or above were much more likely to enrol in a Russell Group or 1994 Group university than students with a lower grade, and those with an average of A or above were even more likely to study at a Russell Group university. Conversely high attaining A Level students were least likely to attend Million+ institutions.

[30] The breakdown by HE mission group does not make allowances for the fact that reputation and prestige vary in different ways for many subjects. Notably, some courses at post-1992 universities (typically within the University Alliance or Million+ Group) within certain subject areas have excellent research ratings and reputations, and as such are in a position to make high offers to applicants. For these reasons when the specific university is available it is possible to consider alternative measures. However, usually Russell Group universities are included among high status institutions (see, as an example, Chowdry *et al.* 2013).

[31] For example, the Guardian University Guide, compiled using data from HESA and HEFCE (available at http://www.guardian.co.uk/education/table/2012/may/21/university-league-table-2013)

Without comprehensive information on the offers made to applicants, it is impossible to separate the variation in entry requirements specified by different institutions from the competition for places (whereby institutions can select the best of the applicants, who might achieve way in excess of what is required) or simply the types of institutions and courses favoured by students with a certain level of attainment. For example, courses in Medicine and Dentistry, predominantly offered at Russell Group universities, have high entry requirements and a high demand compared to the number of places available. As a result, admissions are competitive, leading to a relatively high proportion of non-placed applicants (Wilde and Hoelscher, 2007) and the average entry tariff associated with some institutions is well over 490 UCAS points[32], which corresponds to three A* at A Level and one A* at AS Level, far in excess of the typical offers quoted by these institutions.

Some recent developments and further research

This piece of work is not longitudinal but a snapshot of the distribution of prior qualifications in higher education in one academic year, 2011/12. However, during recent years there have been many changes in education and assessment, particularly relating to level 3 qualifications and university admissions policies, which could potentially change some of our findings.

Firstly, new qualifications have been introduced at level 3 that aim to prepare learners for study at university (*e.g.* Cambridge Pre-U or the Extended Project), qualifications have been withdrawn (*e.g.* final awarding of diplomas will be in 2014) and other qualifications are being comprehensively reformed (*e.g.* AS and A Levels). The uptake of these qualifications will probably fluctuate and therefore patterns of entry at university of undergraduates holding them could also vary in the next few years.

Secondly, the uptake of vocational qualifications has increased in the years previous to our research. However, following the Wolf review of vocational education (Wolf, 2011), the government announced a reform to performance tables to remove the perverse incentives which could have pushed young people into qualification routes that did not allow them to progress into further education. On the other side, there are plans to raise the status of vocational courses in sixth forms and colleges in England with the introduction of a technical baccalaureate (DfE, 2013b). This qualification will be taught at a level of difficulty meant to show that pupils are able to carry out "complex and non-routine" skills, on a par with A Levels and will become a league table performance measure from 2017. Those two reforms might have an impact on the provision and uptake of vocational qualifications in schools in the coming years and therefore on the distribution of students with these qualifications in higher education institutions and subjects.

Thirdly, from the academic year 2012/13, students attending universities in the UK have been charged new, higher university tuition fees. The cost of each individual course is up to the university offering it but, while it was originally claimed that £9,000 was the maximum amount universities could charge and that very few would decide to go that high, over a third of universities are charging the full amount. It has been claimed that this could affect the aims of the widening participation agenda, and students from low socio-economic backgrounds might find themselves with restricted options.

[32] http://www.guardian.co.uk/education/table/2012/may/22/university-guide-medicine

Based on all the above, it might be wise to carry out further research in a few years' time to review trends over time on the prior learning of undergraduates in UK higher education institutions.

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Appendix A: Subject areas at university

As mentioned earlier in the report, the subjects of study at university for each student were provided as JACS2 course codes. Of the 1312 possible codes, 655 were represented in the first subject field.

Subjects of study can be aggregated into 20 broad subject areas. Students who were studying a mixed course at university were recoded as 'Other/combined', unless more than 50% of the degree was in the same subject area (this included all major/minor combinations, as well as balanced combinations of subjects in the same area and some three-way combinations).

The table below presents the subject areas used in this research, along with the ten most popular course subjects for each.

Subject area	*Course subject*	*Number of students*	*% of those in subject area*
Architecture, Building and Planning	(K100) Architecture	2020	47.4
	(K240) Quantity surveying	330	7.8
	(K230) Building surveying	310	7.2
	(K220) Construction management	305	7.1
	(K130) Architectural technology	295	6.9
	(K200) Building	250	5.9
	(K400) Planning (urban, rural & regional)	210	4.9
	(K120) Interior architecture	100	2.3
	(K310) Landscape architecture	85	1.9
	(K900) Others in architecture, building & planning	70	1.6
Biological Sciences	(C800) Psychology	9275	31.7
	(C600) Sports science	8895	30.4
	(C100) Biology	4100	14.0
	(C700) Molecular biology, biophysics & biochemistry	1665	5.7
	(C300) Zoology	1000	3.4
	(C900) Others in biological sciences	690	2.4
	(C810) Applied psychology	465	1.6
	(C110) Applied biology	325	1.1
	(C990) Biological sciences not elsewhere classified	250	0.9
	(C500) Microbiology	220	0.7

Subject area	*Course subject*	*Number of students*	*% of those in subject area*
Business and Administrative studies	(N100) Business studies	10035	37.2
	(N200) Management studies	3315	12.3
	(N400) Accounting	2415	9.0
	(N500) Marketing	2100	7.8
	(N300) Finance	1935	7.2
	(N820) Event management	1425	5.3
	(N800) Hospitality, leisure, tourism & transport	940	3.5
	(N120) International business studies	840	3.1
	(N870) Recreation, sport & leisure studies	835	3.1
	(N240) Retail management	325	1.2
Creative Arts and Design	(W300) Music	3090	10.9
	(W400) Drama	2980	10.5
	(W200) Design studies	2645	9.3
	(W230) Clothing/fashion design	2555	9.0
	(W100) Fine art	2410	8.5
	(W210) Graphic design	2070	7.3
	(W600) Cinematics & photography	1445	5.1
	(W640) Photography	1435	5.1
	(W500) Dance	835	2.9
	(W220) Illustration	795	2.8
Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects	(T700) American studies	375	48.8
	(T200) Japanese studies	85	10.9
	(T100) Chinese studies	55	7.4
	(T900) Others in Eastern, Asiatic, African, American & Australasian languages, literature & related subjects	35	4.8
	(T210) Japanese language studies	35	4.3
	(T600) Modern Middle Eastern studies	30	4.0
	(T730) American society & culture studies	30	3.8
	(T610) Modern Middle Eastern language studies	25	3.3
	(T110) Chinese language studies	25	3.0
	(T300) South Asian studies	20	2.3

Subject area	*Course subject*	*Number of students*	*% of those in subject area*
Education	(X120) Training teachers - primary	3635	44.5
	(X300) Academic studies in education	2195	26.9
	(X900) Others in education	650	8.0
	(X310) Academic studies in nursery education	585	7.2
	(X151) Training teachers - coaching	275	3.4
	(X370) Academic studies in education (across phases)	140	1.7
	(X200) Research & study skills in education	105	1.3
	(X320) Academic studies in primary education	100	1.2
	(X360) Academic studies in specialist education	85	1.1
	(X390) Academic studies in education not elsewhere classified	65	0.8
Engineering	(H300) Mechanical engineering	2690	22.6
	(H200) Civil engineering	1930	16.2
	(H100) General engineering	1445	12.2
	(H600) Electronic & electrical engineering	1420	12.0
	(H400) Aerospace engineering	850	7.2
	(H330) Automotive engineering	580	4.9
	(H810) Chemical engineering	530	4.5
	(H800) Chemical, process & energy engineering	325	2.7
	(H610) Electronic engineering	320	2.7
	(H700) Production & manufacturing engineering	285	2.4
European Languages, Literature and related subjects	(R100) French studies	1410	38.2
	(R900) Others in European languages, literature & related subjects	620	16.7
	(R400) Spanish studies	435	11.7
	(R200) German studies	340	9.3
	(R800) European studies	215	5.8
	(R000) European languages, literature & related subjects	180	4.9
	(R300) Italian studies	125	3.4
	(R110) French language	120	3.3
	(R990) European languages, literature & related subjects not elsewhere classified	60	1.7
	(R700) Russian & East European studies	55	1.5

Subject area	*Course subject*	*Number of students*	*% of those in subject area*
Historical and Philosophical studies	(V100) History by period	6250	56.2
	(V500) Philosophy	1540	13.9
	(V350) History of art	720	6.5
	(V600) Theology & religious studies	650	5.8
	(V400) Archaeology	395	3.6
	(V140) Modern history	350	3.1
	(V110) Ancient history	260	2.3
	(V300) History by topic	250	2.3
	(V610) Theology	150	1.3
	(V271) International history	120	1.1
Law	(M200) Law by topic	4335	44.0
	(M100) Law by area	4160	42.3
	(M000) Law	280	2.8
	(M110) UK legal systems	270	2.7
	(M900) Others in law	265	2.7
	(M211) Criminal law	210	2.2
	(M990) Law not elsewhere classified	70	0.7
	(M111) English law	60	0.6
	(M221) Business & commercial law	50	0.5
	(M290) Law by topic not elsewhere classified	45	0.5
Linguistics, Classics and related subjects	(Q300) English studies	5530	55.1
	(Q320) English literature	1630	16.3
	(Q800) Classical studies	980	9.8
	(Q310) English language	935	9.3
	(Q100) Linguistics	670	6.7
	(Q200) Comparative literary studies	155	1.6
	(Q000) Linguistics, classics & related subjects	60	0.6
	(Q500) Celtic studies	20	0.2
	(Q910) Translation studies	20	0.2
	(Q600) Latin studies	10	0.1
Mass Communications and Documentation	(P300) Media studies	3285	40.0
	(P500) Journalism	2080	25.4
	(P310) Media production	730	8.9
	(P303) Film studies	545	6.6
	(P311) Television production	325	3.9
	(P210) Public relations	290	3.5
	(P313) Film production	160	1.9
	(P301) Television studies	150	1.8
	(P400) Publishing	120	1.4
	(P200) Publicity studies	105	1.3

Subject area	*Course subject*	*Number of students*	*% of those in subject area*
Mathematical and Computer Sciences	(G100) Mathematics	5760	37.0
	(G400) Computer science	5640	36.2
	(G500) Information systems	1490	9.6
	(G450) Multimedia computing science	910	5.8
	(G600) Software engineering	455	2.9
	(G420) Networks & communications	280	1.8
	(G610) Software design	210	1.3
	(G300) Statistics	90	0.6
	(G120) Applied mathematics	85	0.5
	(G620) Programming	80	0.5
Medicine and Dentistry	(A100) Pre-clinical medicine	2305	47.6
	(A300) Clinical medicine	1915	39.5
	(A400) Clinical dentistry	320	6.6
	(A200) Pre-clinical dentistry	280	5.7
	(A900) Others in medicine & dentistry	25	0.5
Physical Sciences	(F100) Chemistry	3075	23.3
	(F300) Physics	2630	19.9
	(F800) Physical geographical sciences	2235	16.9
	(F410) Forensic science	1010	7.6
	(F600) Geology	865	6.6
	(F750) Environmental sciences	590	4.5
	(F840) Physical geography	525	4.0
	(F400) Forensic & archaeological sciences	240	1.8
	(F900) Others in physical sciences	160	1.2
	(F810) Environmental geography	140	1.1
Social studies	(L100) Economics	4875	23.2
	(L300) Sociology	4690	22.3
	(L200) Politics	3095	14.7
	(L700) Human & social geography	2200	10.4
	(L500) Social work	875	4.2
	(L900) Others in social studies	720	3.4
	(L250) International relations	475	2.3
	(L600) Anthropology	375	1.8
	(L510) Health & welfare	370	1.8
	(L400) Social policy	350	1.7

Subject area	*Course subject*	*Number of students*	*% of those in subject area*
Subjects allied to Medicine	(B740) Adult nursing	2850	18.6
	(B900) Others in subjects allied to medicine	1915	12.5
	(B230) Pharmacy	1860	12.2
	(B160) Physiotherapy	990	6.5
	(B730) Paediatric nursing	890	5.8
	(B760) Mental health nursing	645	4.2
	(B700) Nursing	645	4.2
	(B100) Anatomy, physiology & pathology	565	3.7
	(B720) Midwifery	525	3.4
	(B930) Occupational therapy	420	2.8
Technologies	(J930) Audio technology	705	41.9
	(J900) Others in technology	295	17.5
	(J400) Polymers & textiles	155	9.1
	(J500) Materials technology not otherwise specified	100	5.8
	(J600) Maritime technology	85	5.1
	(J511) Engineering materials	50	3.0
	(J920) Ergonomics	35	2.2
	(J513) Furniture technology	30	1.9
	(J960) Transport logistics	30	1.8
	(J931) Music recording	30	1.8
Veterinary Sciences, Agriculture and related subjects	(D300) Animal science	725	24.1
	(D422) Equine studies	345	11.4
	(D200) Clinical veterinary medicine & dentistry	295	9.8
	(D400) Agriculture	270	9.0
	(D310) Veterinary nursing	220	7.3
	(D100) Pre-clinical veterinary medicine	190	6.4
	(D447) Environmental conservation	155	5.2
	(D328) Animal welfare	125	4.2
	(D490) Agriculture not elsewhere classified	95	3.2
	(D600) Food & beverage studies	70	2.3

Subject area	*Course subject*	*Number of students*	*% of those in subject area*
Other/Combined	(Y000) Combined/general subject unspecified	940	4.1
	(L200) Politics & (V100) History by period	720	3.1
	(B000) Subjects allied to medicine & (C000) Biological sciences & (F000) Physical sciences	430	1.9
	(Q300) English studies & (V100) History by period	370	1.6
	(C800) Psychology & (L300) Sociology	355	1.5
	(C100) Biology & (F100) Chemistry	345	1.5
	(Q300) English studies & (W400) Drama	290	1.3
	(L200) Politics & (V500) Philosophy	265	1.2
	(Q300) English studies & (W800) Imaginative writing	260	1.1
	(C600) Sports science & (N870) Recreation, sport & leisure studies	260	1.1

Appendix B: University groups

Some universities have formed groups through which they share ideas and resources regarding issues and procedures in the higher education sector.

In this Appendix, a description taken from statements provided on their websites and a list of members of each group is provided.

The Russell Group (http://www.russellgroup.ac.uk)

"The Russell Group is an association of leading UK research-intensive universities committed to maintaining the highest standards of research, education and knowledge transfer. The members of The Russell Group have the quality and strengths to compete successfully in the global market place for research, skills, expertise and training."

"The aims and objectives of The Russell Group are to promote the interests of universities in which teaching and learning are undertaken within a culture of research excellence, and to identify and disseminate new thinking and ideas about the organisation and management of such institutions."

List of member institutions of the Russell Group
The Queen's University of Belfast
The University of Birmingham
The University of Bristol
The University of Cambridge
Cardiff University
University of Durham
The University of Edinburgh
The University of Exeter
The University of Glasgow
Imperial College of Science, Technology and Medicine
King's College London
The University of Leeds
The University of Liverpool
London School of Economics and Political Science
The University of Manchester
The University of Newcastle-upon-Tyne
The University of Nottingham
The University of Oxford
Queen Mary and Westfield College
The University of Sheffield
The University of Southampton
University College London
The University of Warwick
The University of York

1994 Group (http://www.1994group.ac.uk)

"The 1994 Group represents nineteen of the UK's most research-intensive and internationally renowned universities. The 1994 Group's mission is to promote excellence in research and teaching. Seeking to promote excellence in the student experience is therefore at the very heart of what we do. Each member institution delivers an extremely high standard of education to its students, demonstrating excellence in teaching and academic support, and providing learning in a research-rich community."

List of member institutions of the 1994 Group
Birkbeck College
The University of East Anglia
The University of Essex
Goldsmiths College
The University of Lancaster
The University of Leicester
Loughborough University
Royal Holloway and Bedford New College
The School of Oriental and African Studies
The University of Sussex

University Alliance (http://www.university-alliance.ac.uk)

"The University Alliance, previously convened informally as the Alliance of Non-Aligned Universities, was formed in 2006 comprising a mixture of pre and post 1992 universities. The member institutions have a balanced portfolio of research, teaching, enterprise and innovation integral to their missions and represent a strong voice from the middle sector making a vital contribution to the prosperity of the country."

List of member institutions of the University Alliance
Bournemouth University
The University of Bradford
Cardiff Metropolitan University
Coventry University
De Montfort University
University of Glamorgan
Glasgow Caledonian University
University of Hertfordshire
The University of Huddersfield
Kingston University
The University of Lincoln
Liverpool John Moores University
The Manchester Metropolitan University
The University of Wales, Newport
The University of Northumbria at Newcastle
The Nottingham Trent University
Oxford Brookes University
The University of Plymouth
The University of Portsmouth
The University of Salford
Sheffield Hallam University
Teesside University
University of the West of England, Bristol

Million+ (http://www.millionplus.ac.uk)

"We are a university think-tank. This means we work to help solve complex problems in higher education and to ensure that policy reflects the potential of the UK's world-class university system."

"Our member institutions pride themselves on diversity, flexibility and opportunity: each has its own specialities, qualities and principles, but together they provide a network of institutions that truly promote aspiration, excellence and innovation."

List of member institutions of the Million+ Group
University of Abertay Dundee
Anglia Ruskin University
Bath Spa University
University of Bedfordshire
Birmingham City University
The University of Bolton
Canterbury Christ Church University
The University of Central Lancashire
University of Cumbria
University of Derby
The University of East London
Edinburgh Napier University
The University of Greenwich
Leeds Metropolitan University
London Metropolitan University
Middlesex University
Staffordshire University
The University of Sunderland
The University of the West of Scotland
The University of West London
The University of Wolverhampton

Appendix C: Data cleaning

The dataset received from HESA (described in Section 2.1) was in a relatively raw state, as we opted to receive it in this form rather than have it pre-cleaned by HESA analysts. Given that the data was sourced by HESA from multiple data suppliers (higher education institutions), who used information from UCAS and possibly other sources, the reasons for apparent inconsistencies could not always be established.

This Appendix details the actions taken to clean the data in preparation for analysis. Further details are available on request.

Qualification, subject and grade fields

The following problems were evident:

Field	***Problem***	***Addressed by***
Qualification type	Invalid qualification	Remove from dataset.
	Intermediate results which are not a qualification as such, such as results in individual IB subjects	Remove from dataset.
	Duplicate qualifications (such as Advanced Subsidiary, GCE AS Level; multiple types of BTEC)	Recode and merge as appropriate. Merge BTECs but create new field to hold size of BTEC (number of grades).
	Multiple qualifications of the same 'family' in the same subject held by the same student. For example, student recorded as having both AS and A Level in History; or OCR National Certificate and Diploma in Health and Social Care.	Remove all but the highest value qualification in a particular 'family' for each subject held by each student from dataset – for: • AS/A Levels • BTEC • OCR Nationals • Advanced/Progression Diplomas
	Irrelevant qualification (such as music theory)	Restrict dataset to qualifications specified by OCR.
Qualification subject	Duplicate or similar subjects	Recode according to qualification type: A Levels – from subjects in DfE Statistical First Release (SFR02/2012). BTEC, Diploma, OCR Nationals – grouped into sectors using information on DfE, Edexcel and OCR websites.
	Subject not offered in the qualification	Following advice from HESA, the decision was made to prioritise the qualification type over the qualification subject if there was an inconsistency. Hence subject field was set to blank in these cases.

	Qualifications in the subject field	Qualification was moved to the qualification field and the subject field was set to blank.
	Students with duplicate qualifications (due to resits)	Re-sits were removed, by keeping the highest grade for each student within each recoded subject. In some recoded subjects, for A Levels, it was possible to have genuinely distinct A Levels (for example, students might take two 'Other modern language' A Levels). See below.
Qualification grade	Missing grade for qualification	Qualification removed.
	Inconsistent formatting of grades (*e.g.* *, A*, a*, A*'…); Invalid grade for qualification (*e.g.* A* for BTEC)	Grades were recoded to the available grades, where there was a clear correspondence (*e.g.* A*' was recoded to A*) and removed if not valid.
	Presence of failed qualifications	Only qualifications that were graded as a pass were kept in the dataset; for example, A Levels graded U were removed.

The original file had 259165 students, of whom 3.5% (8990 students) were not considered in the analyses due to the restrictions above.

Inspection of the recoded A Level subjects revealed that in some subjects there were seemingly genuine duplicates, such as students taking more than one A Level in 'other modern languages'. In these cases, for the analysis in Section 4 the student was treated as having taken two A Levels in the subject, and the higher of the two grades was taken forward. This was applied for the following subjects:

- Classical studies
- Media/Film/TV Studies
- Music
- Other modern languages

Previous institution field

HESA supplied students' previous institution using four sets of reference numbers: DfE codes (seven-digit numbers, referred to elsewhere as LAESTAB), UCAS codes (U followed by five digits) and HESA codes (H followed by four digits), and five generic codes such as 'UK State School (4901)' where an individual institution could not be assigned. In some cases, the same institution was represented in the data by three different reference numbers. The reason for the existence of multiple codes for the same institution is not clear, but may be linked to the ways in which UCAS forms are completed: some students apply through forms partially pre-populated by their school/college, so that the institution details are standardised and qualifications/subjects not offered can be filtered out, whereas other students apply individually. Not all students apply via UCAS, and this may account for the separate HESA codes. In addition, the data is supplied to HESA by the HE institutions, so individual institutions may have made changes to the data themselves.

Although our analysis did not seek to examine results by individual schools and colleges, we used centre type as an explanatory variable, and used the individual institution in the multilevel modelling (which considered students nested within institutions). As such it was important to match as many students as possible to institutions (a) with a valid DfE number so that matching on centre type could be performed; (b) in as few distinct codes as possible (eliminating duplicates) to allow grouping of students within the same institution.

The following problems were evident:

Problem	***Solution***
Duplication of institutions – between UCAS, HESA and DfE codes	Use exact, fuzzy and manual matching by name (using the HESA dataset, the DfE KS5 census dataset and the NCN 2011 dataset), to attempt to map institutions to valid DfE codes, and use locations of pupils (at LSOA level) to verify the match.
Duplication of institutions – between two DfE codes	Use Edubase to identify outdated DfE codes with their up-to-date equivalents and merge.
	Where the LA part of the code is not valid (due to boundary changes and redefinitions), map to new area and search for matching ESTAB parts. Use locations of pupils (at LSOA level) to verify the match.
Invalid or implausible institutions (such as primary schools)	Recode to correct institution where obvious; otherwise, leave in the data.
Anachronistic institutions (long-closed schools; academies opening from September 2011 and later)	Recode to correct institution for year 2010/11 where obvious; otherwise, leave in the data.
Some institutions not given (other/unknown)	Leave in the data.
Assignment of pupils to institutions not always plausible where names are similar, given information on pupil address.[33]	If not already dealt with above, for example because the coded institution is invalid, leave in the data.

The cleaning process substantially reduced the number of institution codes present in the data (by 46%), and ensured that 95% of students could be associated with a DfE code. The majority of the remaining 5% were assigned to generic categories (or unknown) by HESA so no matching was possible.

[33] While one would not expect complete correspondence between prior institution location and students' domicile (particularly for independent schools), the location of students (particularly more than one) far from their supposed school but in the vicinity of similarly-named schools is less plausible.

Appendix D: Categorisation of A Level students

A Level subjects were categorised using the following rules proposed in Bramley (2012):

Category	***Rule***
STEM	Science, Technology, Engineering and Mathematics subjects.
Humanities	Knowledge, skills and understanding expressed mainly through extended writing
Languages	Require learning some of the vocabulary and grammar of a second language.
Expressive	Knowledge, skills and understanding expressed mainly through performances or artefacts.
Applied	Knowledge, skills and understanding lead more directly to jobs or job-related further courses.

This resulted in the following assignment of subjects to categories:

Applied	Expressive	Humanities	Languages	STEM
Accounting and Finance	Art & Design	Archaeology	French	Biology
Applied Art & Design	Design & Technology	Classical studies	German	Chemistry
Applied Business	Music	Critical Thinking	Other modern languages	Computer Studies
Applied Engineering	Performance Studies	Drama and Theatre Studies	Spanish	Further Mathematics
Applied ICT		Economics		Geology
Applied Science		English Language		Human Biology
Business Studies		English Language & Literature		ICT
Business Studies and Economics		English Literature		Mathematics
Food studies		Environmental Studies		Physics
Health and Social Care		General Studies		Science
Home Economics		Geography		
Law		Government & Politics		
Leisure and Recreation		History		
Physical Education		History of Art		
Travel and Tourism		Media/Film/TV Studies		
World Development		Other communication studies		
		Other social studies		
		Philosophy		
		Psychology		
		Religious Studies		
		Sociology		

Bramley (2012) identified the following possibly controversial subject categorisations: Geology (classified as STEM), Psychology (classified as a Humanity), Applied Science (classified as Applied). To these could be added ICT (classified as STEM rather than Applied) and Classical studies which has been classified as a Humanity but could encompass languages such as Latin or Ancient Greek. However, as the focus of this analysis is classifying students, rather than subjects, the impact of these individual cases should be minimal.

Students were then assigned to categories. First the population of students was reduced to those who had passed at least three A Levels, excluding General Studies. This gave 181,190 students. Then the number of A Levels that each student had in each category was calculated, and the following rules were used:

- If more than half of a student's A Levels are in one category, assign them to this category (they must have at least two A Levels in the category, as we have previously restricted to students with three A Levels)
- If they do not have two A Levels in any single category, they are not specialists so assign them 'None'
- If the student has two subjects in exactly one category but this does not form the majority (for example they have taken four A Levels, spread across categories in the configuration 2+1+1), assign them to this category
- If the student has two subjects in at least two categories, assign them to the 'Multiple' category

This resulted in the assignment of students to specialisms shown in Table D1.

Table D1: A Level students in each category

A Level specialism	***Number***	***%***
None	22515	12.4
Applied	7520	4.2
Expressive	3620	2.0
Humanities	87040	48.0
Languages	2380	1.3
STEM	54950	30.3
Multiple	3165	1.7

The seven most popular configurations of A Levels, which together accounted for 98.7% of students with at least three A Levels, are shown in Table D2. A configuration of 2+1, for example, indicates that a student took two A Levels in one category (which has therefore been assigned as their specialism) and a third A Level in another category.

Table D2: Configurations of A Levels

Configuration	***A Level specialism***							***Total***	***%***
	Applied	***Expressive***	***Humanities***	***Languages***	***Multiple***	***No specialism***	***STEM***		
1+1+1	0	0	0	0	0	22080	0	22080	12.2
2+1	6585	3315	47460	1880	0	0	24490	83725	46.2
2+1+1	370	190	2545	385	0	0	2010	5495	3.0
2+2	0	0	0	0	2945	0	0	2945	1.6
3	460	95	30510	35	0	0	17165	48260	26.6
3+1	90	15	4115	65	0	0	5890	10175	5.6
4	5	0	1990	5	0	0	4280	6275	3.5

Appendix E: Students' socio-demographic background and prior qualifications

This appendix focuses on the relationship between the qualifications attained prior to enrolment at university and some students' characteristics.

Table E1 shows the gender breakdown of students who were enrolled in a UK university with the different prior qualifications considered in this research. Some prior qualifications were clearly more frequent among male students, such as Free Standing Maths, Pre-U and Progression Diplomas, while others among female students, especially AS Level (Double), Asset Languages, Extended Project and Key Skill level 3/4.

Table E1: Percentages of male and female students, by prior qualification

Prior qualification		***Gender***	
		Male	***Female***
A Level[34]		45.3	54.8
A Level (Double)		33.1	66.9
AS Level[35]		44.5	55.5
AS Level (Double)		35.8	64.2
A+AS Level combined		39.7	60.3
Advanced Diploma		48.6	51.4
Asset Languages[36]		'..'	'..'
BTEC	All types	52.3	47.7
	Award	50.2	49.8
	Certificate	55.4	44.6
	Diploma	52.1	47.8
Extended Project		39.5	60.6
Free Standing Maths		60.0	40.0
Functional Skills Level 2		50.0	50.0
IB		44.3	55.7
Key Skill Level 2		45.4	54.6
Key Skill Level 3/4		37.8	62.2
OCR National	All types	50.9	49.1
	Certificate	54.5	45.5
	Diploma	44.9	55.1
	Extended Diploma	43.1	56.9
Pre-U GPR		51.5	48.5
Pre-U Principal Subject		66.0	34.0
Pre-U Short Course		'..'	'..'
Principal Learning		51.0	49.0
Progression Diploma		66.2	33.8

[34] Includes applied (single) A Levels.

[35] Includes applied (single) AS Levels.

[36] Percentages calculated on groups which contain 52 or fewer individuals were suppressed and represented as '..', following HESA's rounding strategy.

Table E2 shows that high deprived students were more likely to hold Double A and AS Levels and vocationally-related qualifications like BTEC, OCR Nationals or Progression Diplomas. Furthermore it is clear that low deprived students are more likely to gain at least one A Level than their highly deprived peers.

Table E2: Percentages of students with different levels of deprivation, by prior qualification

Prior qualification		***Level of deprivation***		
		Low	***Average***	***High***
A Level		32.6	36.5	30.9
A Level (Double)		21.4	29.7	48.9
AS Level		34.0	36.8	29.2
AS Level (Double)		21.6	29.6	48.8
A+AS Level combined		26.5	33.8	39.7
Advanced Diploma		21.7	36.9	41.4
Asset Languages		'..'	'..'	'..'
BTEC	All types	18.3	31.4	50.3
	Award	17.9	32.4	49.6
	Certificate	15.4	27.9	56.7
	Diploma	19.1	32.0	48.9
Extended Project		33.8	36.8	29.3
Free Standing Maths		32.2	35.5	32.3
Functional Skills Level 2		21.3	34.9	43.9
IB		36.9	39.7	23.4
Key Skill Level 2		19.2	32.3	48.5
Key Skill Level 3/4		30.8	38.4	30.8
OCR National	All types	19.4	31.3	49.3
	Certificate	20.3	31.8	47.9
	Diploma	18.1	30.1	51.9
	Extended Diploma	17.3	31.4	51.3
Pre-U GPR		33.1	44.2	22.7
Pre-U Principal Subject		49.8	36.7	13.4
Pre-U Short Course		'..'	'..'	'..'
Principal Learning		21.2	35.1	43.7
Progression Diploma		13.9	30.8	55.4

Table E3 shows the distribution of students over different centre types, by prior qualifications. The most interesting results relate to the fact that some qualifications were particularly offered by some centre types. This is the case of further and tertiary colleges with BTEC, Advanced Diploma, Functional Skills Level 2, some OCR Nationals and Principal Learning. This last qualification is also quite common among students in comprehensive centres, together with OCR National Certificate, Progression Diploma and Asset Languages. It is worth noting that these mentioned qualifications were taken by the more deprived students, suggesting a certain association between the level of deprivation and the type of school attended.

Table E3: Percentages of students in each prior institution type, by prior qualification

Prior qualification		*Prior centre type*						
		Academy	*Comprehensive*	*Independent*	*Selective*	*Sixth Form Colleges*	*FE Colleges*	*Other*
A Level		2.8	40.6	13.2	9.2	18.4	11.8	4.1
A Level (Double)		3.9	53.4	1.1	1.3	22.4	11.6	6.4
AS Level		2.7	39.7	13.9	10.2	20.0	10.0	3.5
AS Level (Double)		2.5	31.5	0.6	1.9	27.2	26.5	9.9
A+AS Level combined		5.9	55.9	1.5	2.9	17.7	13.2	2.9
Advanced Diploma		2.7	31.4	0.2	5.1	11.4	46.6	2.6
Asset Languages		'..'	'..'	'..'	'..'	'..'	'..'	'..'
BTEC	All types	3.3	17.2	0.8	0.2	12.0	62.0	4.6
	Award	8.9	48.8	1.6	0.5	12.6	23.0	4.7
	Certificate	7.1	35.6	0.8	0.4	18.8	32.9	5.4
	Diploma	1.1	5.2	0.6	0.	10.5	78.3	4.4
Extended Project		3.5	34.2	7.8	13.5	26.9	11.4	2.8
Free Standing Maths		1.2	15.2	10.6	7.3	41.8	21.9	2.0
Functional Skills Level 2		1.0	8.5	0.1	0.8	7.2	80.7	1.6
IB		4.2	13.4	34.9	19.8	9.6	8.4	9.7
Key Skill Level 2		0.4	3.8	0.3	0.1	18.5	71.6	5.3
Key Skill Level 3/4		0.1	16.0	1.6	1.1	55.4	23.4	2.5
OCR National	All types	9.2	61.7	0.4	0.7	10.7	14.1	3.3
	Certificate	11.3	72.6	0.5	0.7	5.8	5.7	3.5
	Diploma	6.2	49.9	0.3	0.8	18.3	21.8	2.8
	Extended Diploma	2.9	15.4	0.0	0.0	23.5	54.9	3.3
Pre-U GPR		0.0	18.4	6.8	64.4	0.6	9.2	0.6
Pre-U Principal Subject		3.6	9.2	75.9	9.7	0.0	0.4	1.2
Pre-U Short Course		'..'	'..'	'..'	'..'	'..'	'..'	'..'
Principal Learning		3.4	34.8	0.1	4.6	11.1	43.1	2.8
Progression Diploma		9.23	61.5	0.0	0.0	9.2	20.0	0.0

The following figures consider combinations of mainstream prior qualifications rather than individual qualifications with students being classified as Academic, Mixed or Vocational.

Figure E1 shows that the Academic and Mixed programmes of study were more popular among female students. Figure E2 shows a clear pattern between the programme of study and the level of deprivation: the less university-oriented is the programme of study, the more is the percentage of students from high deprived areas. Figure E3 highlights that students from independent and selective schools have not gained vocational qualifications and are particularly likely to be in the academic route; students from comprehensive centres were more likely to take academic or mixed programmes of study; students from sixth form colleges were more likely to follow mixed routes, while students from further education and tertiary colleges were very likely to follow vocational pathways.

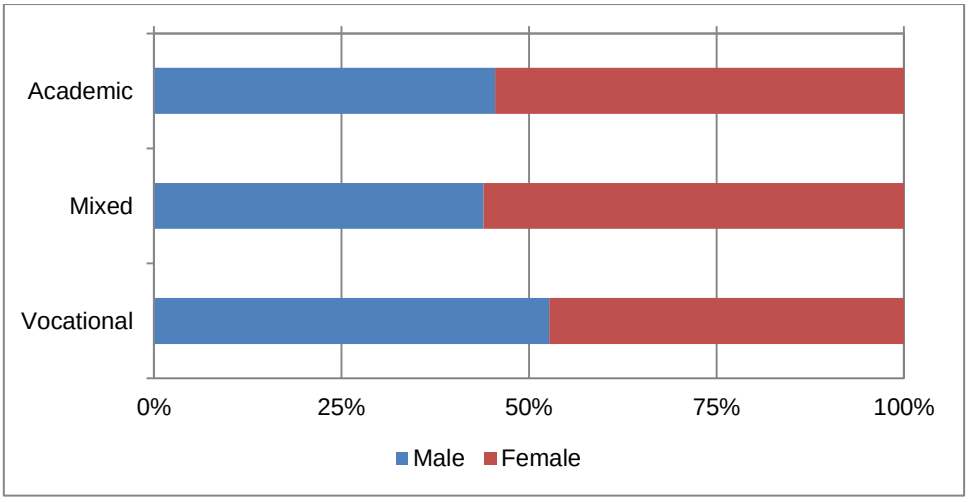

Figure E1: Percentages of male and female students, by programme of study

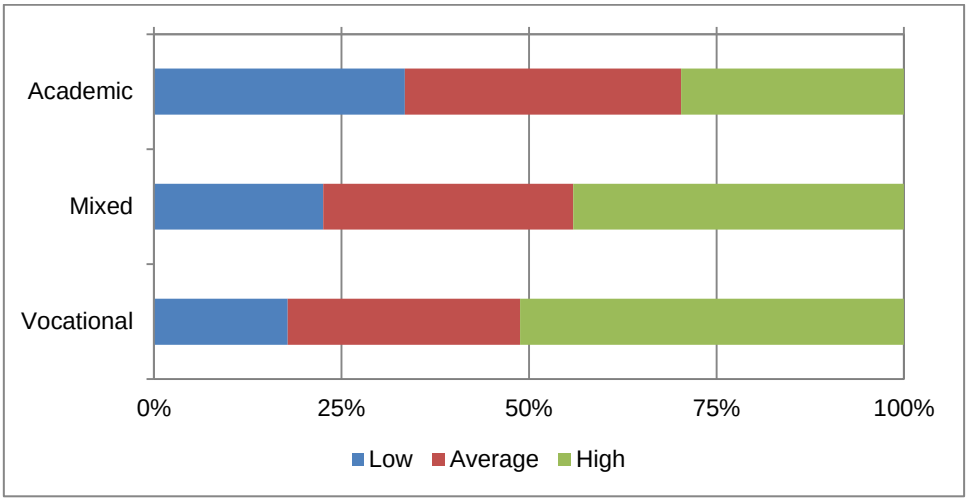

Figure E2: Percentages of students with different levels of deprivation, by programme of study

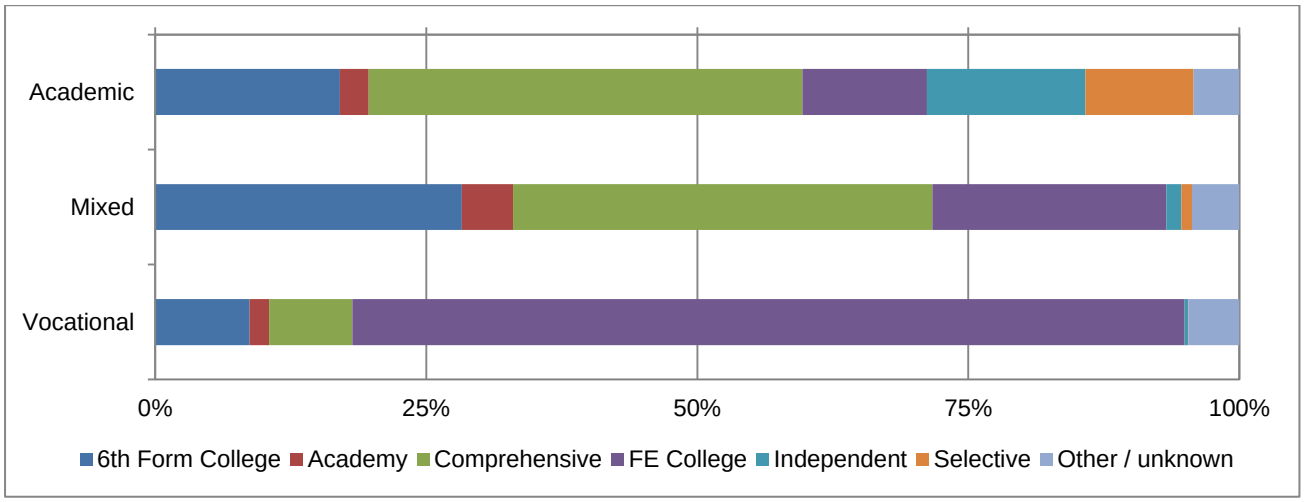

Figure E3: Percentages of students in each prior institution type, by programme of study

Appendix F: Odds ratios for prior qualifications

Table F1: Odds ratios for mainstream prior qualifications in comparison to A Levels (candidates have only the stated qualification)

University mission group	***Prior qualification***			
	IB	***Pre-U***	***BTEC***	***OCR National***
Russell Group	**2.98**	**4.25**	**0.18**	**0.10**
1994 Group	**1.63**	0.37	**0.46**	**0.26**
University Alliance	**0.38**	**0.07**	**1.09**	1.15
Million +	**0.31**	0.03	**1.55**	**2.17**
Other	**0.73**	0.57	**1.21**	0.96

Note: In bold significant odds ratios at the 0.05 level

Table F1(b): Odds ratios for mainstream prior qualifications in comparison to A Levels (candidates have only the stated qualification) ~ university subject area taken into account

University mission group	***Prior qualification***			
	IB	***Pre-U***	***BTEC***	***OCR National***
Russell Group	**2.46**	**4.96**	**0.21**	**0.11**
1994 Group	**1.46**	0.36	**0.52**	**0.30**
University Alliance	**0.43**	**0.08**	1.00	0.98
Million +	**0.36**	-	**1.37**	**1.85**
Other	**0.80**	0.59	**1.13**	0.93

Note: In bold significant odds ratios at the 0.05 level

Table F2: Odds ratios for combinations of prior qualifications in comparison to A Levels only

University mission group	***Prior qualifications***					
	A Level + BTEC	***A Level + Double A Level***	***A Level + Extended Project***	***A Level + GPR***	***A Level + OCR National***	***A Level + Pre-U***
Russell Group	**0.12**	**-**	**2.16**	**2.15**	**0.23**	**1.64**
1994 Group	**0.47**	-	**1.09**	1.45	**0.38**	1.24
University Alliance	**2.20**	1.56	**0.64**	0.67	**1.73**	**0.58**
Million +	1.00	2.40	**0.62**	**0.46**	**1.44**	**0.54**
Other	0.97	0.46	**0.82**	0.76	0.94	**0.61**

Note: In bold significant odds ratios at the 0.05 level

Table F2(b): Odds ratios for combinations of prior qualifications in comparison to A Levels only ~ university subject area taken into account

University mission group	*Prior qualifications*					
	A Level + BTEC	***A Level + Double A Level***	***A Level + Extended Project***	***A Level + GPR***	***A Level + OCR National***	***A Level + Pre-U***
Russell Group	**0.15**	-	**1.88**	**1.87**	**0.26**	**1.80**
1994 Group	**0.53**	-	1.02	1.28	**0.41**	1.15
University Alliance	**2.01**	1.18	**0.70**	0.75	**1.57**	**0.63**
Million +	**0.85**	1.91	**0.68**	**0.46**	**1.27**	**0.53**
Other	**0.90**	0.47	**0.86**	0.81	0.92	**0.58**

Note: In bold significant odds ratios at the 0.05 level

Table F3: Odds ratios for vocational and mixed programmes of study in comparison to academic

University mission group	*Programme of study*	
	Vocational	***Mixed***
Russell Group	**0.19**	**0.35**
1994 Group	**0.45**	**0.52**
University Alliance	**1.06**	**1.75**
Million +	**1.63**	**1.20**
Other	**1.22**	**0.95**

Note: In bold significant odds ratios at the 0.05 level

Table F3(b): Odds ratios for programme of study in comparison to academic ~ university subject area taken into account

University mission group	*Programme of study*	
	Vocational	***Mixed***
Russell Group	**0.23**	**0.41**
1994 Group	**0.53**	**0.57**
University Alliance	0.97	**1.61**
Million +	**1.45**	**1.08**
Other	**1.14**	**0.91**

Note: In bold significant odds ratios at the 0.05 level