Department for Education

TEF and informing student choice

Subject-level classifications, and teaching quality and student outcome factors

Research report

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Background and methodology

1.1 The Teaching Excellence and Student Outcomes Framework (TEF) was recently introduced to measure teaching quality and student outcomes across Higher Education (HE) in the UK, with a view to driving up quality, and better inform students when making applications. Ratings (Gold, Silver, Bronze or Provisional) are currently awarded at provider-level, and from 2019-2020 they will also be awarded at subject-level.

1.2 This study is intended to provide evidence to refine the design of subject-level TEF, and more broadly, the teaching quality and student outcomes factors contained within it. As well as informing Government policy development, this research will also be available to the statutory independent reviewer of TEF. In particular the project seeks to answer:

- What is the best subject-level classification that allows students to most effectively identify subject-specific TEF information for course/s they want to study?
- Which teaching quality and student outcomes factors are important to students, and might inform TEF development?
- What is the relative importance of TEF-related factors for students' choice of HE provider and the quality of student experience?

1.3 To reflect the separate objectives of the study, the research was split into two distinct online surveys. The first (part one) focussed on subject-level classification, and was directed at those applying to an HE undergraduate course starting in 2018/19. The second (part two) focussed on teaching quality and student outcomes, and was directed at both applicants and current students (first and second years). Both surveys also covered current awareness of the TEF.

1.4 Fieldwork took place between 29th November and 22nd December 2017, with a total of 1,806 responses in part one and 2,035 in part two.

Key findings: Subject classifications

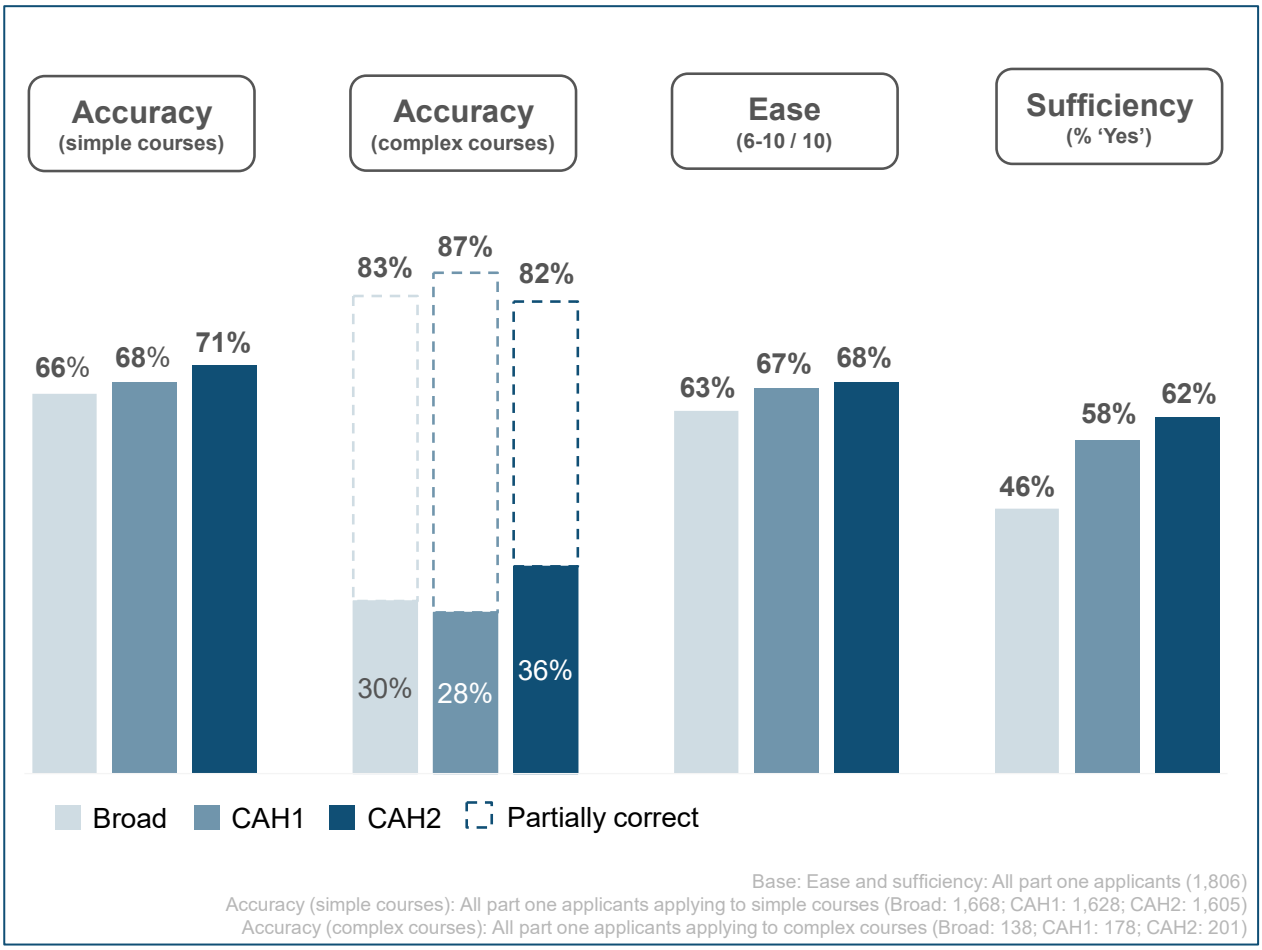
1.5 In order to administer the TEF at subject level, a subject classification system is needed to define what a 'subject' is for the purpose of assessment and ratings. The government is currently proposing to use Level 2 of the Common Aggregation Hierarchy (CAH2) as the subject classification system for the subject-level TEF. This part of the research therefore tests CAH2 to ensure students can find the right information about the course they are studying. It also compares CAH2 with Level 1 of the Common Aggregation Hierarchy (CAH1, containing 23 subject areas) and the

Broad classification (containing 7 subject areas), to establish whether CAH2 is the most useable and preferred classification system by applicants.

1.6 Applicants were shown three different subject classifications; Broad (7 subject areas), CAH1 (23 subject areas) and CAH2 (35 subject areas), and asked which subject area's TEF award they would pick if they wanted an indication of the quality of their preferred course.

1.7 The survey's set-up was able to ascertain whether the applicant selected the 'correct' subject area for each classification, by linking to a database that mapped courses on to subject areas within each classification. Applicants were then asked how easy they found using the classifications, and whether a TEF award for their chosen subject area would be sufficient to help them choose where to study. Key findings are shown in Figure 1.1.

Figure 1.1 Summary of key subject classification measures



1.8 Within each of the three classifications, the majority of applicants selected the correct subject area for their preferred course. Among those studying simple courses (i.e. courses only classified to one subject area), seven in ten (71%) selected the CAH2 subject area correctly. This compared with 68% correctly selecting their CAH1 subject area, and 66% their Broad subject area. The only statistically significant difference across the classifications was between CAH2 and

Broad, i.e. applicants were more likely to select the correct CAH2 subject area compared with their Broad subject area.

1.9 For complex courses (i.e. where courses are classified to more than one subject area), applicants had an option to select more than one subject area.

1.10 Around a third of applicants on complex courses accurately selected all subject areas to which their course belonged (30% Broad, 28% CAH1, 36% CAH2), while more than 80% accurately selected at least one correct subject area using each classification (83% Broad, 87% CAH1, 82% CAH2). There were no statistically significant differences in the proportion of (partial or fully) correct responses across each of the classifications.

1.11 Between 60 and 70% of applicants applying to 'complex' courses indicated they would be likely to look up information across multiple subject areas (61% Broad, 64% CAH1, 69% CAH2).

1.12 The majority of applicants (on simple or complex courses) reported that their course was 'easy' to classify with little variation by classification (63% Broad, 67% CAH1, 68% CAH2). However, applicants were more likely to find CAH2 'very easy' to use (49%), compared with Broad (41%) and CAH1 (43%).

1.13 Applicants were asked whether a TEF subject award in each classification would provide sufficient information to help them choose where to study. For the Broad classification, 46% of applicants considered the subject sufficient, rising to 58% for CAH1 and 62% for CAH2.

1.14 Overall, the survey results suggest that for applicants, the CAH2 subject classification is the best performing classification of the three tested. This holds across most subgroups, with some exceptions, although these instances show only minor deviations from the overall pattern. Among older applicants and those domiciled outside of the UK CAH1 tended to perform slightly better, while among BME applicants and those applying to Medium/Low Tariff universities there was little difference between CAH1 and CAH2.

1.15 Outcomes by subject area varied widely. Looking at the best performing classification, CAH2, for the majority of subject areas, at least two-thirds of applicants correctly classified their course. Applicants applying to Communications and media (59%), and Sociology, social policy and anthropology (55%) tended to be less accurate, while only one in seven (14%) accurately classified their course to Subjects allied to medicine not otherwise specified. For this subject area, which was designed to incorporate courses such as Therapy, Nutrition, Optometry and Biomedical science, applicants considered the terminology was too vague and they struggled to think of specific courses that should be included within the subject area, especially as Medicine, Dentistry, Biosciences and Nursing were covered by other CAH2 classifications.

Key findings: Teaching quality and student outcome factors

1.16 In part two of the research, 20 factors relating to teaching quality and student outcomes were tested with applicants and students to determine their relative importance. The 20 factors (listed below) can be summarised into the following four groups:

- Teaching staff factors
- Course factors
- Graduate outcomes
- Wider opportunities.

1.17 Using a MaxDiff trade-off approach[1], applicants were asked to consider the importance of these factors when deciding where to study. Students were asked to consider the importance of these factors in influencing the overall quality of their undergraduate experience.

1.18 The two most important factors for both applicants and students were the likelihood of securing a graduate job, and potential exposure to employers, industry and workplaces. 'Inspiring and engaging staff' was the third most important factor for applicants and the fourth most important for students, who considered that the qualification received at the end of the course was slightly more important. The importance of earning potential was considerably higher among students than applicants.

1.19 The table below illustrates the importance of all 20 factors, across applicants and students.

[1] See Chapter 4 for details.

Table 1.1 Importance of factors in determining where to study (applicants) and quality of undergraduate experience (students)

	Applicants	Students
Base (All)	***984***	***1,050***
Whether students get graduate level jobs after they graduate	2.40	3.02
Whether students are exposed to and involved with employers, industry and workplace	2.19	1.97
Whether teaching staff are inspiring and engaging	1.94	1.72
Whether there are good resources and facilities available to students	1.63	1.40
Whether the course leads to a professional qualification	1.56	1.81
Whether students are able to study a variety of subjects	1.30	1.18
Whether teaching staff are leading experts in industry or business	1.28	1.25
Whether students give positive feedback (about the teaching and experience of studying at that provider)	1.19	0.56
Whether the course boosts students' earning potential	1.09	1.52
Whether students are exposed to and involved in cutting edge ideas and research	0.97	0.81
Whether the institution is committed to continuous improvement in teaching	0.78	0.73
Whether academic standards are rigorous and stretching	0.68	0.58
Whether students are able to specialise deeply in one subject	0.66	0.67
Whether students are exposed to and involved in cutting edge ideas and research	0.58	0.60
Whether students improve their transferable soft skills	0.55	0.70
Whether teaching staff have high level academic qualifications such as PhDs	0.30	0.35
Whether students receive a high number of contact hours	0.29	0.35
Whether teaching staff have teaching qualifications	0.28	0.35
Whether students are taught in small class sizes	0.26	0.31
Whether teaching staff are on permanent contracts	0.08	0.11

Table ranked by order of importance attributed among applicants

1.20 There was little variation by gender, ethnicity or social disadvantage of the applicant and student. However, more differences were apparent when looking at the following groups: international applicants, and the average tariff of institution to

which the applicant/student applied/belonged. Full analysis of statistically significant sub-groups is provided in Chapter 4.

1.21 By subject of study, for *applicants* to Business and management (3.35) and Computing (3.27), exposure to industry was the most important factor while for applicants to Law (2.74), and Languages, linguistics and classics (2.55), inspiring and engaging staff was the most important factor.

1.22 Among *students* studying Economics (4.67) and Business and management (4.31), graduate level jobs were of considerably more importance than for students studying other subjects. Meanwhile, there were only four subject areas where securing graduate level employment was not considered to be the most important factor for students:

- among those studying Creative arts and design, and Architecture, building and planning, exposure to employers, industry and workplaces was the most important factor (2.98 and 2.56 respectively);
- for those in the fields of Law, and General and others in sciences, inspiring and engaging teaching staff was considered most important (2.44 and 2.95 respectively).

1.23 When invited, most students and applicants did not propose any new factors that they considered important when deciding where to study or in influencing their undergraduate experience. When new factors were mentioned, the most common were; additional or out-of-hours academic support, a good support system, and feedback and advice on progress.

1.24 Students were also asked how satisfied they were with each factor, and with their HE experience as a whole. Regression analysis was then carried out to determine which factors were key to driving overall satisfaction.

1.25 While there was no single dominant factor driving overall student satisfaction, the top two factors were teaching staff factors; “institutions’ commitment to continuous improvement in teaching”, and “whether or not teaching staff are inspiring and engaging”.

1.26 Factors related to the course itself were also key drivers of overall satisfaction, though less so than teaching factors, including feedback about the course provided by other students, whether or not academic standards are rigorous and stretching, the resources and facilities available, the opportunity to study a range of modules and contact hours.

1.27 It is notable that the factors that students considered to be important in determining the quality of their undergraduate degree differ substantially from the factors which stand out as drivers of satisfaction with their undergraduate experience. One explanation for this difference could be that students take a long-term perspective when evaluating what is important to them, focusing on factors such as whether the course leads to graduate-level employment or increased future earnings, but that

more immediate factors – such as inspiring teaching or rigorous and stretching course design – have more impact in driving their current levels of satisfaction. It is also worth noting that there were a number of factors which were both considered to be relatively unimportant and did not appear to drive satisfaction, including class size and whether staff had teaching qualifications or were on permanent contracts.

Key findings: Awareness and perceived use of the TEF

1.28 The TEF is a new initiative and this research was undertaken within six months of the first TEF awards being published. At this stage, it was therefore expected that awareness and use of TEF would be low, with a gradual increase expected as the TEF becomes more embedded. Levels of early awareness and actual and intended use of the TEF were captured among applicants in both part one and part two, with few differences across the two surveys. It was expected that knowledge of TEF may be higher in the research sample than the wider applicant sample (see Chapter 5).

1.29 The majority of applicants had heard of the TEF (part one 60%, part two 59%), with two-fifths reporting that they knew what TEF was about (part one 38%, part two 42%), although this dropped to 21% among those who were yet to submit their application. A small minority (part one 15%, part two 16%) reported they had used or intended to use the TEF to inform their application choice.

1.30 Across all applicants, 23% (part one) and 26% (part two) were aware of the TEF award given to their first-choice institution.

1.31 The majority of applicants (part one 68%, part two 78%) considered that subject-level TEF awards would be useful, with 16% and 35% respectively considering it very useful. Only a small minority (part one 5%, part two 3%) considered they would find subject-level TEF to be of no use at all. There is evidence to suggest that greater awareness of the TEF award scheme in general would increase applicants' appreciation for subject-level TEF awards: over eight in ten applicants on both surveys (part one 82%, part two 87%) who were already aware of the TEF considered subject-level TEF would be useful, rising to nine in 10 applicants who were aware of their preferred institution's specific TEF award (part one 88%, part two 90%). This demonstrates a strong association between familiarity with the provider-level TEF and appreciation of the usefulness of subject-level TEF.

Conclusions

1.32 Of the subject classifications tested, the research suggests that CAH2 is the optimal classification to take forward for use within subject-level TEF. The study provides evidence that CAH2 offers the greatest accuracy for making subject-level classifications, and is considered most sufficient for providing information to help applicants choose where to study.

1.33 Rewording some of the CAH2 subject categories should lead to further improvements in accuracy and a likely positive impact on ease of use and suitability. However, for ‘Subjects allied to medicine’ a wider review is recommended.

1.34 The findings indicate that the Broad subject classification (with 7 subjects) would not be helpful to potential applicants to assist in their decision making, based on its poor performance on sufficiency, as well as issues with accuracy among those applying for courses that should be classified as Humanities, Natural Sciences or Social Sciences.

1.35 The study also highlights a number of teaching quality and student outcome factors that could be considered when further developing subject-level TEF. The trade off and regression analysis produced different factors, reinforcing that it is important in the TEF to consider teaching quality factors that have a short term impact on student satisfaction while undertaking an HE course and those with a longer term impact, linked to graduate outcomes. There were a handful of factors that appeared low on the list of both set of analyses and potentially, from a student perspective, could be deprioritised from subject-level TEF development. This includes teaching staff contracts, class sizes and the academic qualifications of teachers.

1.36 The research also provided an opportunity to measure and benchmark levels of awareness of provider-level TEF among the first group of applicants to have had potential exposure to TEF awards. While TEF is still in its early stages of implementation, this research represents an early opportunity to establish a baseline for student engagement with the TEF. The study shows that around two-fifths of 2018/19 applicants (part one 38%, part two 42%) were aware of what TEF refers to and around one in eight (part one 15%, part two 16%) had used the TEF to inform their choice of institution, or intended to do so. Around a quarter (part one 23%, part two 26%) were aware of the TEF award given to their first-choice institution. As TEF becomes more embedded, we would expect applicant and student awareness and usage of TEF to grow over time, and the results from this research will form the baseline against which future awareness and student engagement can be measured.

1.37 The study demonstrates that applicants and students would value the introduction of subject-level TEF ratings. Around three-quarters of all applicants and students (68% part one, 78% part two) reported that they would find subject-level TEF awards useful while only a tiny minority (5% part one, 3% part two) suggested that they would find subject-level TEF to be of no use at all. Applicants that were aware of the provider-level TEF and its purpose were also more likely to consider subject-level TEF to be useful.

2 Background and methodology

Background

2.1 The Teaching Excellence and Student Outcomes Framework (TEF) has been introduced as part of a suite of wide-ranging reforms within Higher Education (HE) in the UK, with a view to driving up quality of and esteem for teaching, and better informing students' choices about what and where to study[2].

2.2 TEF awards are decided by an independent panel of experts, including academics, students and employer representatives. The HE provider's undergraduate teaching is assessed against ten criteria that cover areas of teaching quality, learning environment, student outcomes and learning gain. The TEF panel considers evidence from a set of metrics using national data as well as written evidence submitted by the provider.

2.3 Participating HE providers receive a gold, silver or bronze award reflecting the excellence of their teaching, learning environment and student outcomes. Providers that are eligible but do not yet have sufficient data to be fully assessed are awarded a provisional TEF award. In June 2017, the first TEF awards were assigned to 295 participating HE providers.

2.4 TEF assessments are currently made at provider level. From 2019-2020, following two years of pilots and a technical consultation, TEF assessments will be made at subject level, providing applicants with a better understanding of a provider's teaching quality and student outcomes in the subject they are looking to study.

2.5 In order to administer the TEF at subject level, a subject classification system is needed to define what a 'subject' is for the purpose of assessment and ratings. Subject classification systems group individual courses and programmes together to different levels of granularity and identify different subject area groups that could be awarded a TEF rating. This research explores three subject classifications:

- Level 2 of the Common Aggregation Hierarchy (CAH2), containing 35 subject areas
- Level 1 (CAH1), containing 23 subject areas; and
- Broad subject group, containing seven subject areas grouped from CAH2.

2.6 The government is currently proposing to use CAH2 as the subject classification system for Subject-level TEF. The broad system is also proposed for use in the

[2] The specification for how the TEF functions can be found here: https://www.gov.uk/government/publications/teaching-excellence-and-student-outcomes-framework-specification

assessment process, but not for student-facing ratings or information. This research therefore tests how well CAH2 would work for students, as well as comparing this to CAH1 and the broad classification to test whether the granularity of CAH2 is preferred. CAH2 and the 7 broad subject groups are also being tested with HE providers in the first year of the subject level pilots.

2.7 In particular, this research project looks to answer:

- What is the best subject-level classification that allows students to most effectively identify subject-specific TEF information for course/s they want to study?
- Which teaching quality and student outcomes factors are important to students, and might inform TEF development?
- What is the relative importance of TEF-related factors for students' choice of HE provider and the quality of student experience?

Methodology

2.8 In order to meet the breadth of objectives, the study was split into two parts. The first (Part one) was focussed on subject-level classifications and conducted with applicants to an HE undergraduate course starting in 2018/19, while the second (Part two) focussed on teaching quality and student outcome factors and was conducted with both applicants, and HE students (in their first and second year of study). Each part consisted of a 10-minute online survey, with fieldwork taking place between 29th November and 22nd December 2017. This section takes each part in turn.

Part one: Survey sampling

2.9 The target sample consisted of individuals applying to an HE undergraduate course for the 2018/19 academic year.

2.10 Purposive sampling by JACS was undertaken to achieve a spread of interviews by CAH2 subject areas, and to ensure representation by gender, age and domicile[3].

2.11 Fieldwork was timed before the application deadline in January 2018, to ensure a mix of individuals who had already submitted their application (applicants), and those who had not submitted an application but were planning on doing so (pre-applicants). This approach was taken to understand whether new applicants might

[3] As CAH2 is a new subject classification it does not currently appear on applicant databases. However, the majority of courses within a CAH2 subject area are classified within either one or two JACS groups. JACS (the Joint Academic Coding System) is the current approach for classifying academic subjects and modules. Targets were therefore assigned at JACS level roughly in proportion to the number of CAH2 subject areas that map (broadly) to each JACS subject area.

find the process more difficult than those who had already experienced the application process.

2.12 Both applicants and pre-applicants were sourced from the UCAS database, and topped up by an online student / applicant panel provider, YouthSight[4]. In total there were 1,806 survey responses, with 156 responses from pre-applicants and 1,650 from applicants. Tables A.1.1-A.1.3 in Appendix A show the breakdown by subject area and key subgroups.

Part one: Survey questionnaire

2.13 Applicants first named the title of their preferred course. This answer was automatically linked to a datafile which determined which subject area (within Broad, CAH1 and CAH2) their preferred course belonged to.

2.14 They were then asked to select the subject area they would look at, to get an indication of the quality of their course. They were shown each of the three classifications separately (Broad, CAH1, CAH2), with the order in which these were shown rotated by respondent.

2.15 Due to the linked datafile, the applicants' selected subject area could be marked correct or incorrect. Applicants who chose the incorrect CAH2 subject area were subsequently informed of the correct subject area and asked why they did not select this (to avoid survey fatigue applicants were not asked about incorrect Broad or CAH1 selections). All applicants were also asked how easy they found it to determine which subject area(s) was appropriate for their course, for all three classifications, and whether a TEF award given for the subject area they chose would provide them with a sufficient amount of information to help them choose where to study.

2.16 In this way the survey produced three key measures for determining the usability of each classification: *accuracy*, *ease of use* and *sufficiency* (defined in Chapter 3). In addition, the time it took applicants to make their classification was measured as a comparison marker of the ease and difficulty of using each classification.

2.17 Applicants were also asked about their awareness and use of the provider-level TEF, and whether they would find subject-level TEF useful.

[4] UCAS has more than 380 provider customers including Further education colleges (FECs) and alternative providers (APs). However, numbers applying to FECs and APs are smaller in nature and some applicants apply direct to the provider. As such, applicants to FECs and APs are rather under-represented in the research study, and their response levels too low to allow for statistically robust analysis at this level. This applies to both part one and part two.

2.18 Before the main survey commenced, a soft launch was used to test applicants' comprehension of each question and review sampling assumptions in relation to response rates.

Part two: Survey sampling

2.19 The target samples for part two were individuals applying to an HE undergraduate course for the 2018/19 academic year, and current first and second year students. Unlike part one, there was no target sample of pre-applicants. Applicants who had submitted were of more interest as they would be more likely to have a considered view on the importance of teaching quality and student outcome factors and more likely to have used TEF.

2.20 Across both applicants and students, separate targets were set by subject, gender, age and domicile to achieve a sample which was representative of the applicant and student populations.

2.21 Applicants were sourced through a combination of the UCAS database and an online panel provider, YouthSight, while all students were sourced through YouthSight.

2.22 A total of 2,035 individuals were surveyed in part two, split 984 applicants and 1,051 first and second year students. Tables A.1.1-A1.3 in Appendix A present a breakdown by subject and other key subgroups.

Part two: Survey questionnaire

2.23 A total of 20 teaching quality and student outcome factors were identified prior to the research. These include factors that are already reflected in TEF as well as some factors that have been identified by stakeholders and/or government for potential inclusion in future developments of TEF. These are listed in Chapter 4.

2.24 Applicants were asked which of these teaching factors they considered important when deciding where to study, while students were asked which factors they considered important when thinking about the quality of their HE experience. A max-diff trade-off approach was used to determine levels of importance, with respondents presented with 15 screens, each showing separate lists of four random factors and asked to select the most and least important on each screen[5]. Using this information, an importance score was calculated algorithmically for each factor.

2.25 Students then rated their satisfaction with each factor based on their experience so far of HE, on a scale of 0-10. They also rated their satisfaction with their overall

[5] For example, if a respondent is presented with four options (A, B, C, D) and chooses B as 'most important' and D as 'least important', the following information can be known about the relative importance of each factor to this respondent: (B>A, B>C, B>D, A>D, C>D). Information about the relative importance of A and C is not known here.

experience of their undergraduate degree. This enabled a regression analysis that determined how important each of the 20 factors were in informing a student's overall satisfaction. More information on this and the max-diff trade-off analysis is available in Chapter 4.

2.26 Applicants and students were also asked if they could think of other measures relating to teaching quality and student outcomes that they considered important. As in part one – the survey also asked about applicants' awareness and use of the provider-level TEF, and whether they would find subject-level TEF useful.

2.27 Before the main survey commenced, a soft launch was used to check applicants and students' comprehension of each question and review sampling assumptions in relation to response rates.

Data preparation

2.28 Both surveys underwent a quality assurance process to determine any evidence of 'speeding[6]', acquiescence bias[7] or lack of engagement. As a result of this process, 21 records were removed from the part one datafile, and 19 from part two (all sample size figures and survey results exclude these individuals).

2.29 The abilty to weight the research sample to match the full applicant profile was limited due to small sample sizes for some demographics. If the sample had been fully weighted, this would have introduced errors into the data which would have impacted on the key user-testing research objectives, whilst adding little analytic value.

2.30 Owing to the purposive sampling at subject level, the part one data were weighted to be representative of the subject spread in the applicant population at 1-digit JACS[8]. Weighting also re-balanced the age profile of respondents, after older applicants were under-represented in the final file. On part two, because there was no purposive sampling by subject, and the sample profile was close to the applicant and student population profiles, no weighting was applied.

Structure of the report

2.31 The key findings are covered within three broad chapters:

- Chapter 3 explores applicants' preferred subject-level classification, using the three key measures of accuracy, sufficiency and ease of use.

[6] Evidence of respondents completing the survey in an unrealistically quick time (deemed as under two minutes for these surveys).
[7] A form of response bias whereby respondents agree with all or most questions, where relevant.
[8] 1-digit JACS refers to the letter at the start of each JACS code. See: https://www.hesa.ac.uk/support/documentation/jacs/jacs3-principal

- Chapter 4 determines which teaching quality and student outcome factors are most important to applicants when deciding where to apply, which factors are most important to students when considering the quality of their HE experience, and which factors are most strongly tied to overall student satisfaction.
- Chapter 5 captures applicants' awareness of provider-level TEF and explores how useful they would find subject-level TEF.

2.32 The final chapter (Conclusions) revisits the key findings from the different strands of the research, setting out recommendations where appropriate.

Reporting conventions

2.33 Throughout the report, unweighted base figures are shown on tables and charts to give an indication of the statistical reliability of the figures.

2.34 As a general convention throughout the report, figures with a base size of fewer than 30 applicants/students are not reported, although on charts and tables these figures have been retained for indicative purposes.

2.35 All differences noted are significant to a 95 per cent confidence level unless otherwise stated.

2.36 In some cases, figures in tables and charts may not always add to 100 percent due to rounding (i.e. 99 percent or 101 percent).

2.37 In some sections of the report, reference is made to applicants or students in relation to whether their (preferred) university is high, medium or low tariff. In this report, 'high tariff institutions' are defined as those in the top third of average UCAS tariff rankings, 'medium tariff institutions' are those in the middle third, and 'low tariff universities' are defined as those in the bottom third.

3 Subject-level classifications

Introduction

3.1 In order to administer the TEF at subject level, a subject classification system is needed to define what a 'subject' is for the purpose of assessment and ratings. One of the key aims of Subject-level TEF is to further inform student choice, allowing prospective students to look behind provider-level ratings and access information and ratings for a specific subject. To achieve this, the subject classification system needs to strike a balance between being meaningful for students and, on a practical level, having a manageable level of aggregation for the assessment process.

3.2 Three classifications, based on the recently devised Higher Education of Classification of Subjects (HECoS), were proposed for testing in the research:

- Broad subject group, containing seven subject areas;
- Level 1 of the Common Aggregation Hierarchy (CAH1), containing 23 subject areas; and
- Level 2 of the Common Aggregation Hierarchy (CAH2), containing 35 subject areas

3.3 Table 3.1 overleaf contains a breakdown of these subject areas by each classification.

3.4 The research sought to test how the subject classification systems would work for students if they were used to define ratings in subject-level TEF. The suitability of each classification was tested in terms of accuracy, sufficiency and ease of use for applicants. The CAH2 offered the greatest level of granularity of the three, so was expected to be the preferred option of applicants. This part of the study was conducted with individuals applying in 2017/18 to an HE undergraduate course starting in the 2018/19 academic year.

3.5 The three measures used to assess suitability of each of the classification systems were: *accuracy*: whether applicants selected the correct subject area relating to their preferred course; *sufficiency*:, whether a TEF award given to the subject area they chose would be sufficient to be able to determine the quality of their preferred course; and *ease of use*: how easy or difficult they found the process of selecting a subject area. This chapter explores results to each measure, by all three classifications.

3.6 Analysis then explores differences by subject area; here a greater emphasis is placed on CAH2 findings, to reflect the starting hypothesis that this would be the most suitable classification to use in subject-level TEF; the chapter therefore also captures applicants' responses to why they found certain CAH2 subject areas difficult to understand. Finally, the chapter summarises other subgroup differences, highlighting subgroups that show different subject classification preferences.

Table 3.1 List of subject areas within each classification

Broad	CAH2
Arts	Agriculture, food and related studies
Business and law	Architecture, building and planning
Engineering and technology	Biosciences
Humanities	Business and management
Medical and health sciences	Celtic studies
Natural sciences	Chemistry
Social sciences	Combined and general studies
CAH1	Communications and media
Agriculture, food and related studies	Computing
Architecture, building and planning	Creative arts and design
Biological and sport sciences	Economics
Business and management	Education and teaching
Combined and general studies	Engineering
Communications and media	English studies
Computing	General and others in sciences
Creative arts and design	Geographical and environmental studies
Education and teaching	Health and social care
Engineering and technology	History and archaeology
General and others in sciences	Humanities and liberal arts (non-specific)
Geographical and environmental studies	Languages, linguistics and classics
Historical, philosophical and religious studies	Law
Humanities and liberal arts (non-specific)	Mathematical sciences
Language and area studies	Medicine and dentistry
Law	Nursing
Mathematical sciences	Pharmacology, toxicology and pharmacy
Medicine and dentistry	Philosophy and religious studies
Physical sciences	Physical, material and forensic sciences
Psychology	Physics and astronomy
Social sciences	Politics
Subjects allied to medicine	Psychology
Veterinary sciences	Sociology, social policy and anthropology
	Sport and exercise sciences
	Subjects allied to medicine not otherwise specified
	Technology
	Veterinary sciences

Accuracy of subject classifications

3.7 Applicants were asked which subject area they would first look to, to get an indication of the quality of their preferred undergraduate course. Applicants were asked to make these selections using each of the Broad, CAH1 and CAH2 subject-level classifications. The order that these classifications were presented to applicants was rotated by respondent to mitigate against the possibility of sequencing effects.

3.8 After having selected their first-choice subject area, all applicants were informed that some courses can be categorised into more than one subject area and were then asked to make a second-choice selection.

3.9 For applicants whose preferred course could be classified into three subject areas, they were additionally asked whether there were any further subject areas that they would look to for an indication of course quality.

3.10 It should be noted that the question format as described above could have encouraged applicants to consider further subject areas after making their first choice, when this would not have been their approach in a non-survey setting. Therefore, the core measure for accuracy explored in this section is simply whether applicants were able to correctly classify their preferred course using each of the subject-level classifications on their first-choice selection.

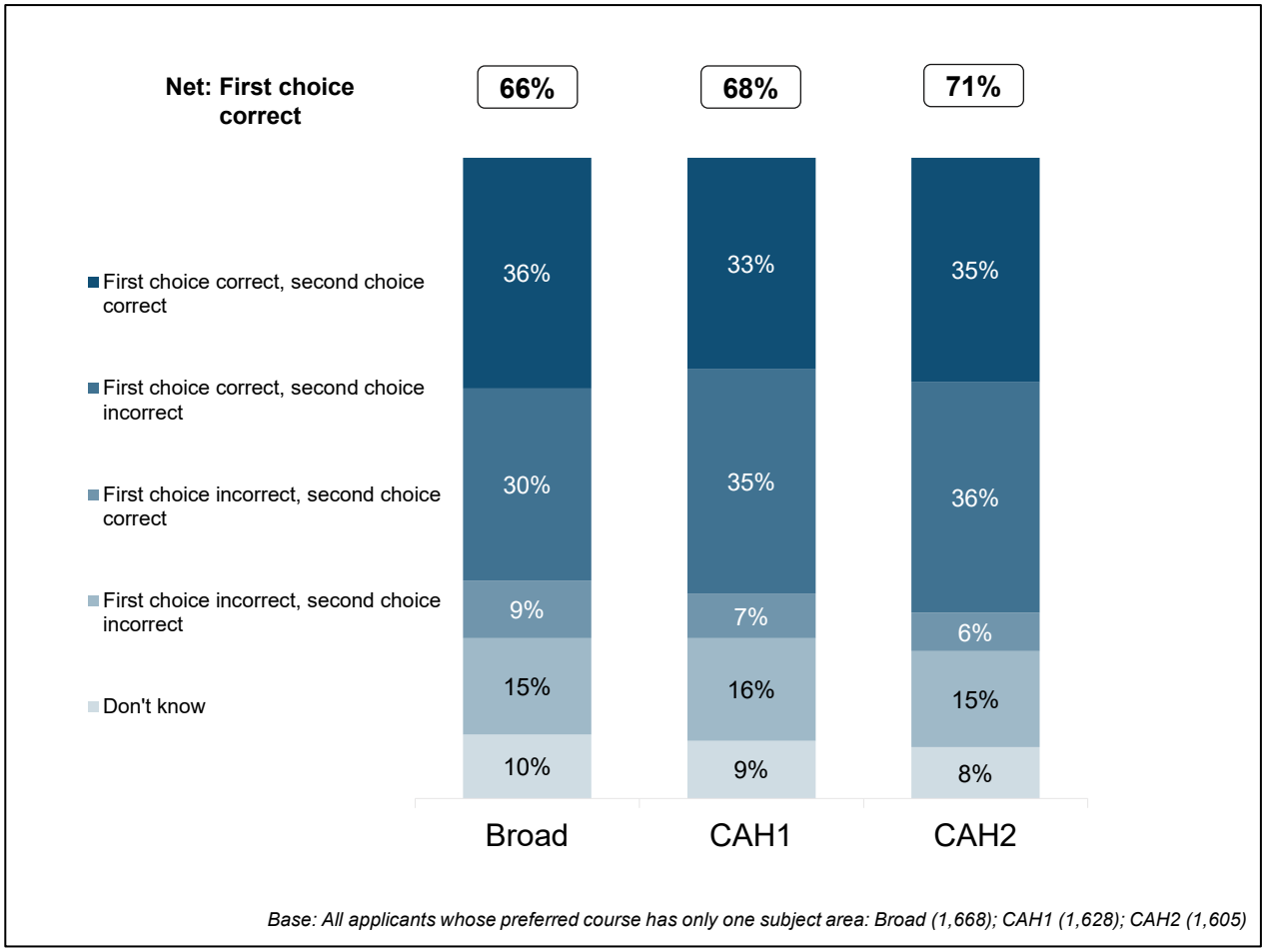
3.11 This section was split by whether applicants' courses were simple, i.e. their course could only be classified into one subject area, or complex, where it could be classified into more than one subject area (such as "Politics, Philosophy and Economics", or "English and Theatre").

Accuracy: Simple courses

3.12 Across all subject-level classifications, most applicants' preferred course was classified as 'simple' (Broad 93%, CAH1 92%, CAH2 91%).

3.13 As Figure 3.1 shows, the majority of applicants were able to make correct subject classifications for simple courses across all three subject-level classifications, on their first-choice selection (Broad 66%, CAH1 68%, CAH2 71%), with a higher proportion correctly classifying to CAH2 than Broad. There were no statistically significant differences in accuracy between CAH2 and CAH1, or between CAH1 and Broad.

Figure 3.1 Accuracy of subject classifications: simple courses



Base: All applicants whose preferred course has only one subject area: Broad (1,668); CAH1 (1,628); CAH2 (1,605)

3.14 Following their first choice subject area selection, applicants were asked whether there were any other subject areas that they would look at for an indication of the quality of their preferred course. Applicants were given this opportunity in an attempt to reflect real behaviour; applicants who are unsure might look into different subject areas, regardless of whether they identify (or think they have identified) the correct subject area the first time.

3.15 Around one-third of applicants to simple courses selected the correct subject area on their first choice selection, but then looked up another subject area on their second choice, rather than selecting the response that specified 'I would not look for any other subject areas relating to my course' (Broad 30%, CAH1 35%, CAH2 36%). Applicants were more likely to look at a second subject area when using CAH1 and CAH2 compared to Broad, most likely due to the number of alternative subject areas available in these classifications.

3.16 Of those applicants who selected a second subject area using CAH1 and / or CAH2, around two thirds said they would be very or fairly likely to do so (CAH1 66%, CAH2 63%). Fewer applicants who selected a second subject area using Broad said they would be very or fairly likely to look up multiple subject areas for their preferred simple course (Broad 57%).

3.17 A minority of applicants were only able to identify the correct subject area on their second-choice selection (Broad 9%, CAH1 7%, CAH2 6%). These applicants were asked how likely or unlikely they would be to look up information from multiple subject areas. Of the applicants who only identified the correct CAH2 subject area on their second choice, 65% said they would be either very or fairly likely to look up information from multiple subject areas to get an indication of course quality, suggesting that a further four per cent of all applicants may have eventually located the correct CAH2 subject area. A similar proportion of applicants who selected the correct subject area on their second choice only said they would be either very or fairly likely to look up multiple information from the other classifications (67% across both Broad and CAH1).

Accuracy: complex courses

3.18 A minority of applicants had a preferred course that was 'complex'; courses that could be classified into two or more subject areas (Broad 7%, CAH1 8%, CAH2 9%).[9][10]

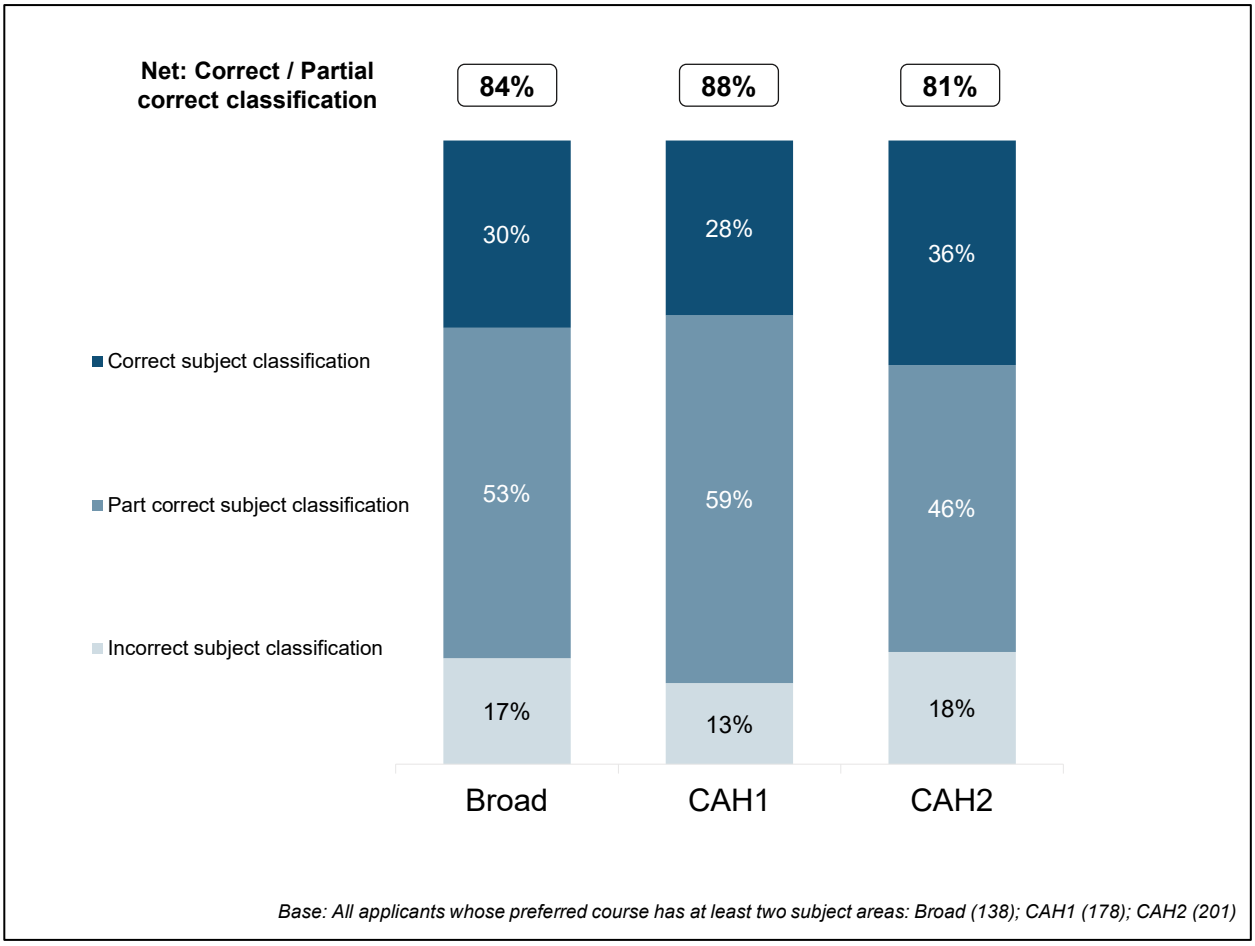
3.19 Between one in four (28%) and one in three (36%) correctly classified their complex course to all relevant subject areas (see Figure 3.2).

3.20 Across all classifications, the majority of applicants were able to correctly identify at least one of the subject areas to which their complex course belonged (Broad 84%, CAH1 88%, CAH2 81%).

3.21 In contrast to simple courses, there were no significant differences in the proportion of (partial or fully) correct responses across each of the classifications.

[9] Unweighted base sizes of those on complex courses: 138 Broad, 178 CAH1 and 201 CAH2.
[10] Complex courses include for example "Politics, Philosophy and Economics" and "English and Theatre".

Figure 3.2 Accuracy of subject classifications: complex courses

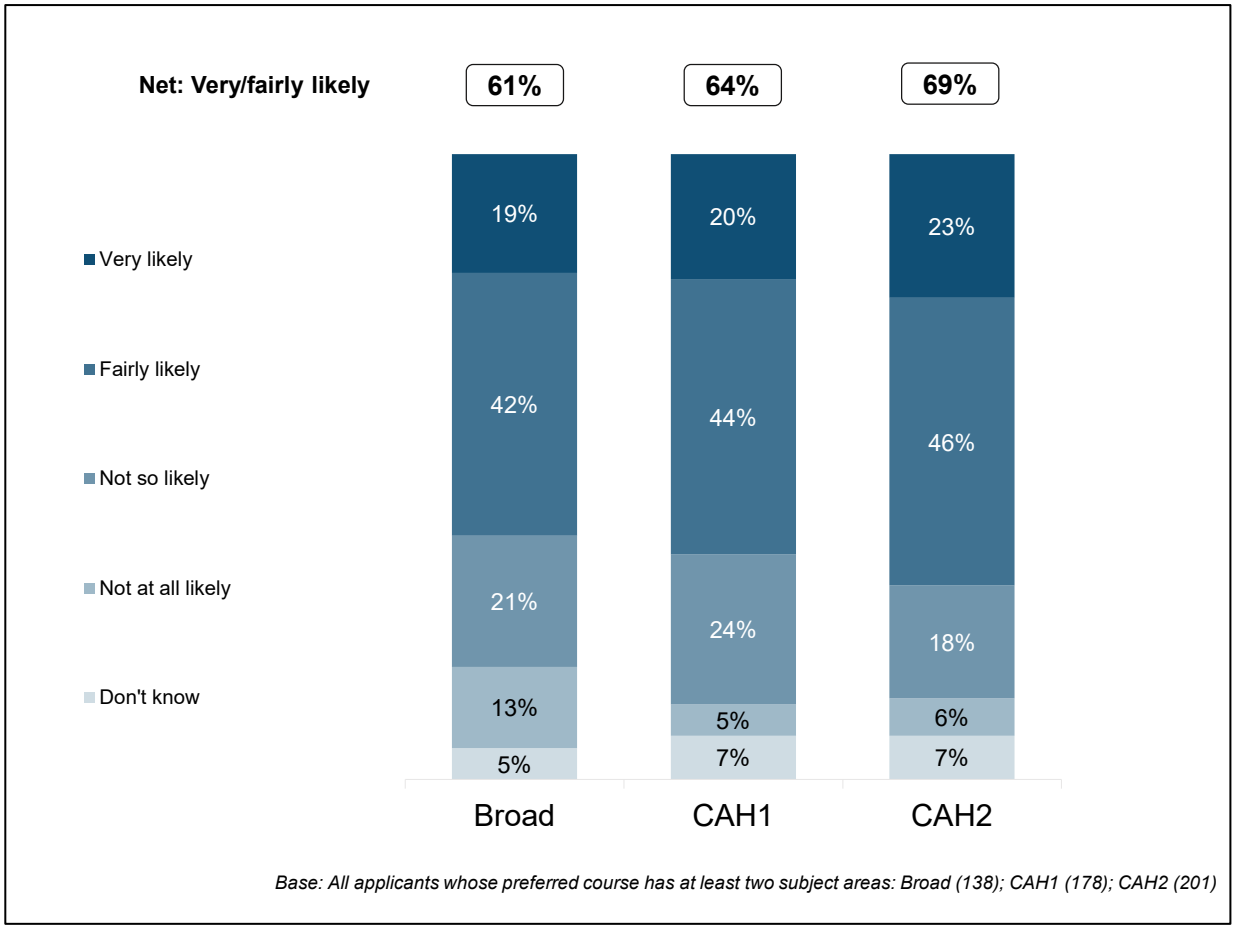


Base: All applicants whose preferred course has at least two subject areas: Broad (138); CAH1 (178); CAH2 (201)

3.22 All applicants to complex courses were asked how likely they would be to look up information across multiple subject areas to gain an indication of the quality of their preferred course.

3.23 As shown in Figure 3.3, around two-thirds reported that they would be very or fairly likely to look at multiple subject areas (Broad 61%, CAH1 64%, CAH2 69%), with no significant difference across the classifications. This suggests that the majority of applicants to complex courses would explore the TEF award for more than one subject area, although it is worth noting that only one in five said they would be 'very' likely to do so (Broad 19%, CAH1 20%, CAH2 23%).

Figure 3.3 Likelihood to explore multiple subject areas for complex courses

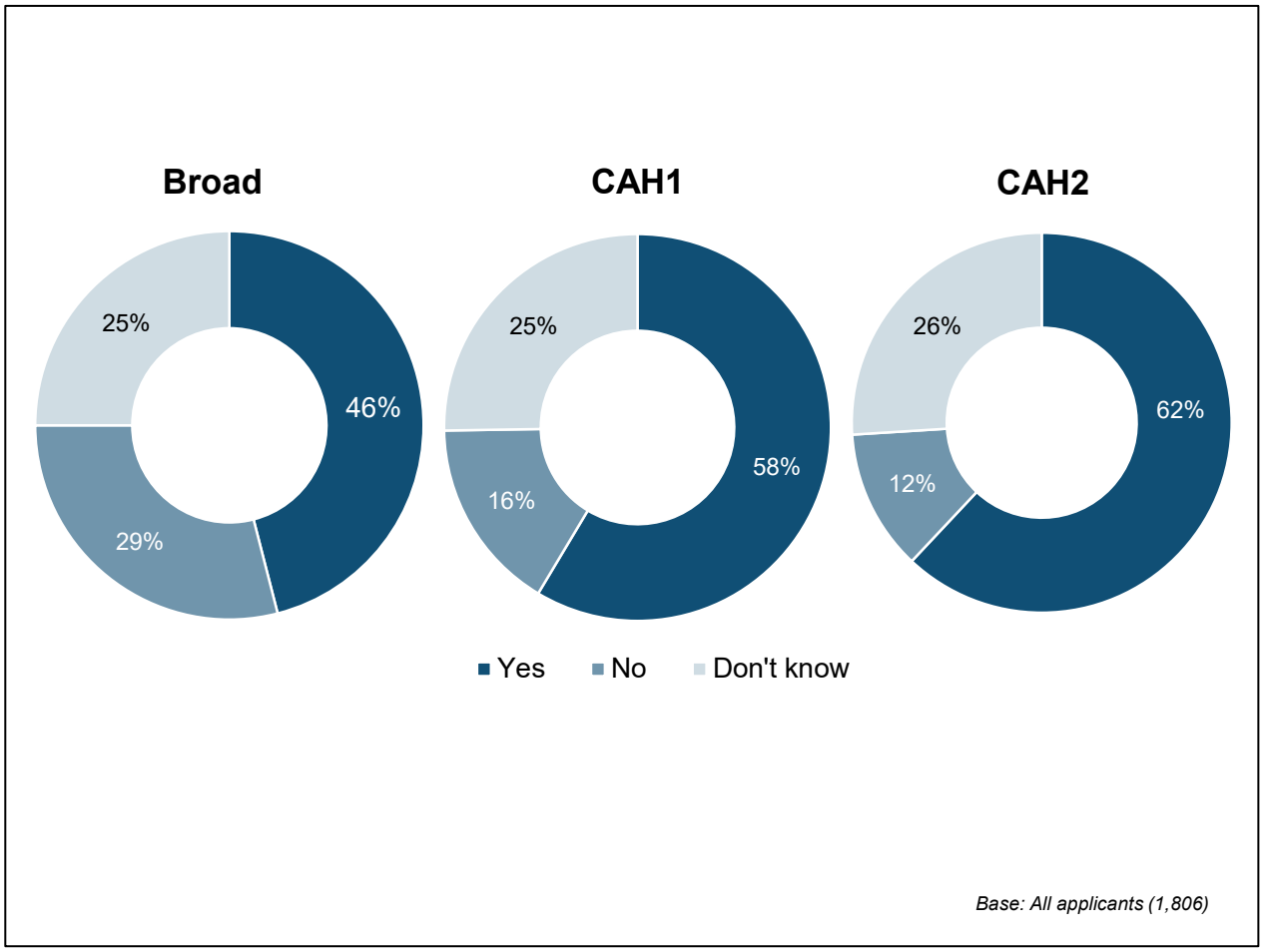


Base: All applicants whose preferred course has at least two subject areas: Broad (138); CAH1 (178); CAH2 (201)

Sufficiency of subject classifications

3.24 Applicants were asked whether a TEF subject award at each of the subject-level classifications would provide a sufficient amount of information to help them choose where to study. As Figure 3.4 shows, applicants were much more likely to find the CAH2 and CAH1 classifications sufficient (62% and 58% respectively), compared to Broad (46%), and were slightly (statistically significantly) more likely to find CAH2 sufficient compared to CAH1.

Figure 3.4 Whether subject classifications provide a sufficient amount of information to help applicants choose where to study

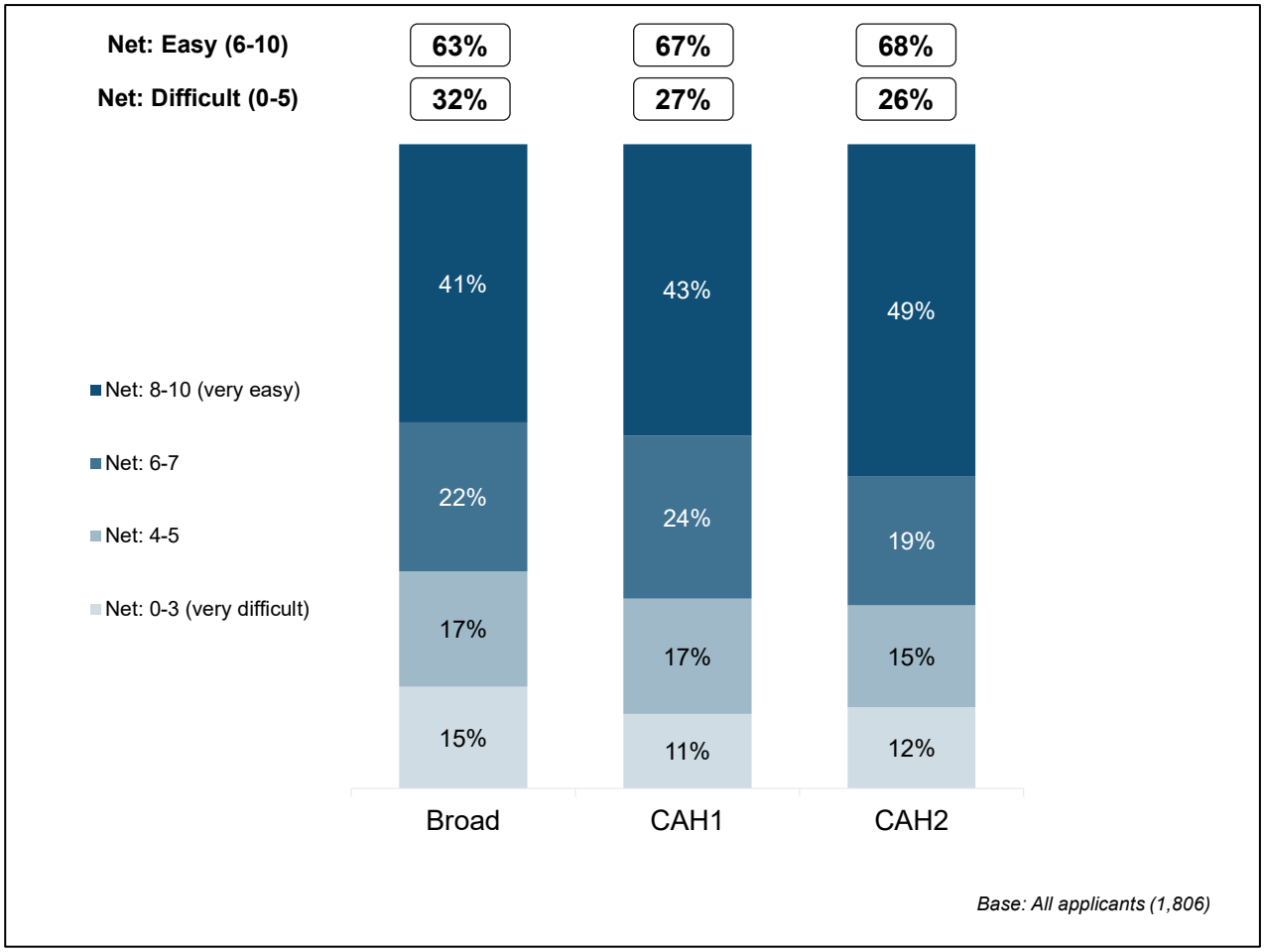


Usability of subject classifications

3.25 Applicants were asked to rate on a scale of 0-10 how easy or difficult they found it to identify the subject area(s) for their preferred course, using each of the subject-level classifications. At the time of answering they were not aware whether they had correctly or incorrectly selected the subject area of their preferred course.

3.26 The majority of applicants considered making classifications to subject areas 'easy' across all classifications (giving a score of 6/10 or greater); applicants were more likely to find CAH1 (67%) and CAH2 (68%) easier to use than Broad (63%). There were no differences by course complexity.

Figure 3.5 Ease of subject classification use



3.27 There were a few types or groups of applicants who were more likely to find certain or all classifications 'difficult' to use (rating 0-5 / 10):

- Female applicants were more likely to rate each of the classifications as 'difficult' to use compared to male applicants (Broad: females – 35%, males – 28%; CAH1: female – 29%, male – 24%; CAH2: female – 28%, male – 22%).
- Applicants from a White background were more likely to find the Broad classification difficult to use, compared to applicants from a BME background (White: 34%; BME: 28%).
- Younger applicants were more likely to find Broad more difficult to use, compared to older applicants (aged under 19 years: 34%; aged 19 years and above: 29%).
- UK-based applicants were more likely to find each of the Broad and CAH1 classifications difficult to use, compared to applicants based outside of the UK (Broad: UK-based – 34%, non-UK – 24%; CAH1: UK-based – 29%, non-UK – 21%).
- Applicants to a distance learning course were more likely to find CAH2 difficult to use (33%), compared to applicants to a non-distance learning course (25%).

3.28 In addition to the accuracy of classification responses, the survey recorded how long applicants took to select the corresponding subject area for their preferred course, using each of the classification systems. The time taken to select subject areas also offers an indication of the usability of the classification systems.

3.29 Applicants were quickest in making their first-choice subject area classifications using Broad (median: 14 seconds), followed by CAH2 (17 seconds) and then CAH1 (19 seconds).

3.30 It is unsurprising that applicants spent the shortest amount of time selecting their Broad subject area, given there are only seven options within this classification. However, the fact that applicants were slightly quicker using CAH2 than CAH1 despite the longer list of subject areas, suggests the additional granularity enables applicants to spot their relevant subject area more quickly.

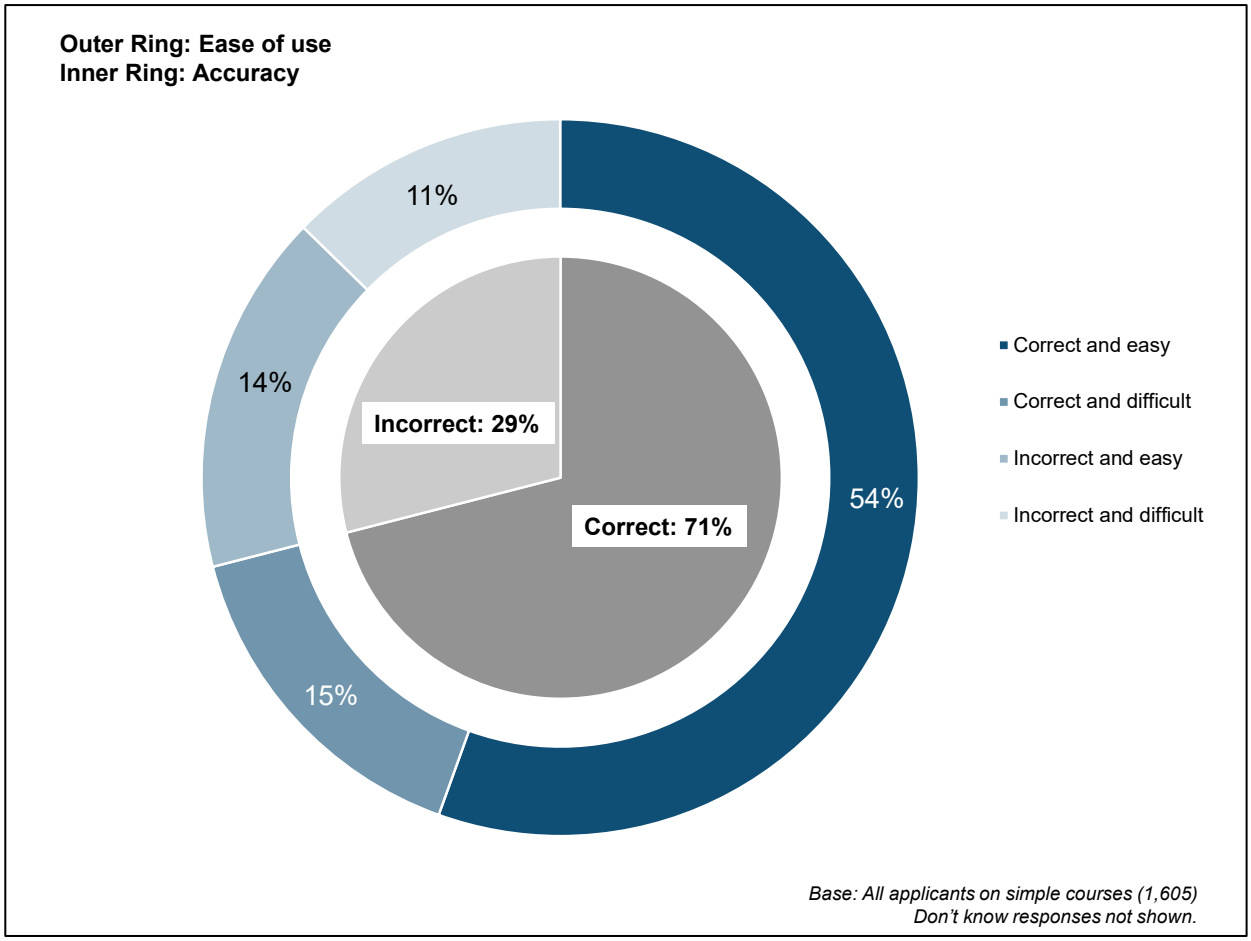
Usability vs. accuracy of CAH2 subject classifications

3.31 Based on the three measures outlined, CAH2 appears to be the most suitable subject classification to take forward for use in subject-level TEF: applicants were most likely to classify their course accurately using this classification (if 'simple'), the majority found it easy to use and they were also more likely to report that it gave them a sufficient amount of information to decide where to study compared to other classifications.

3.32 This section therefore explores the interaction between the accuracy of making subject area classifications for simple courses using CAH2 and the perceived ease of using this classification. Differences by applicant subgroup are also explored in this section.

3.33 While some applicants might have answered their CAH2 subject area correctly they may have had difficulty doing so, or indeed have answered more by chance than design: 15% of all applicants on simple courses accurately classified their course, but reported they had difficulty doing so, as Figure 3.6 shows. Equally there are applicants who considered selecting their CAH2 subject to be an easy process but selected the wrong subject area (14%), suggesting a certain level of misplaced confidence when considering subject areas. These groups should be taken into consideration during future designs of subject-level classification.

Figure 3.6 Usability vs. accuracy of subject classifications



Correct and difficult

3.34 A small but notable proportion of applicants, 15%, identified the correct CAH2 subject area for their preferred course but rated doing so as 'difficult' (a score of 0-5 / 10).

3.35 Pre-applicants were more likely to respond in this way, compared to applicants (Pre-applicants 23%, applicants 14%).

3.36 Applicants who were aware of the TEF but not aware of their institution's award were more likely to select the correct subject area but find it difficult (18%), compared to applicants who were aware of the TEF and of their institution's award (11%).

3.37 There were no other subgroup differences among those who selected the correct CAH2 subject area, but found it difficult.

Incorrect and easy

3.38 Around one in seven (14%) applicants incorrectly identified the CAH2 subject area for their preferred course, but rated CAH2 as 'easy' to use.

3.39 Applicants who applied to a Higher Education provider with a medium / low UCAS tariff were more likely to select the incorrect CAH2 subject area and rate the process as easy, compared to applicants who applied to Higher Education provider with a high tariff (Medium/low 18%, high 10%).

3.40 Female applicants were more likely to select the incorrect CAH2 subject area and rate the process as easy, compared to male applicants (females 16%, males 11%).

3.41 Distance learners (20%) were also more likely to select the incorrect CAH2 subject area and rate the process as easy, compared to non-distance learners (13%).

3.42 Applicants to HE providers in Wales, England and Northern Ireland were more likely to select the incorrect CAH2 subject area but find it easy to do so, compared to applicants to Higher Education providers in Scotland (Wales 20%, England 15%, Northern Ireland 13%, Scotland 3%).

Subject-specific analysis: Broad classification system

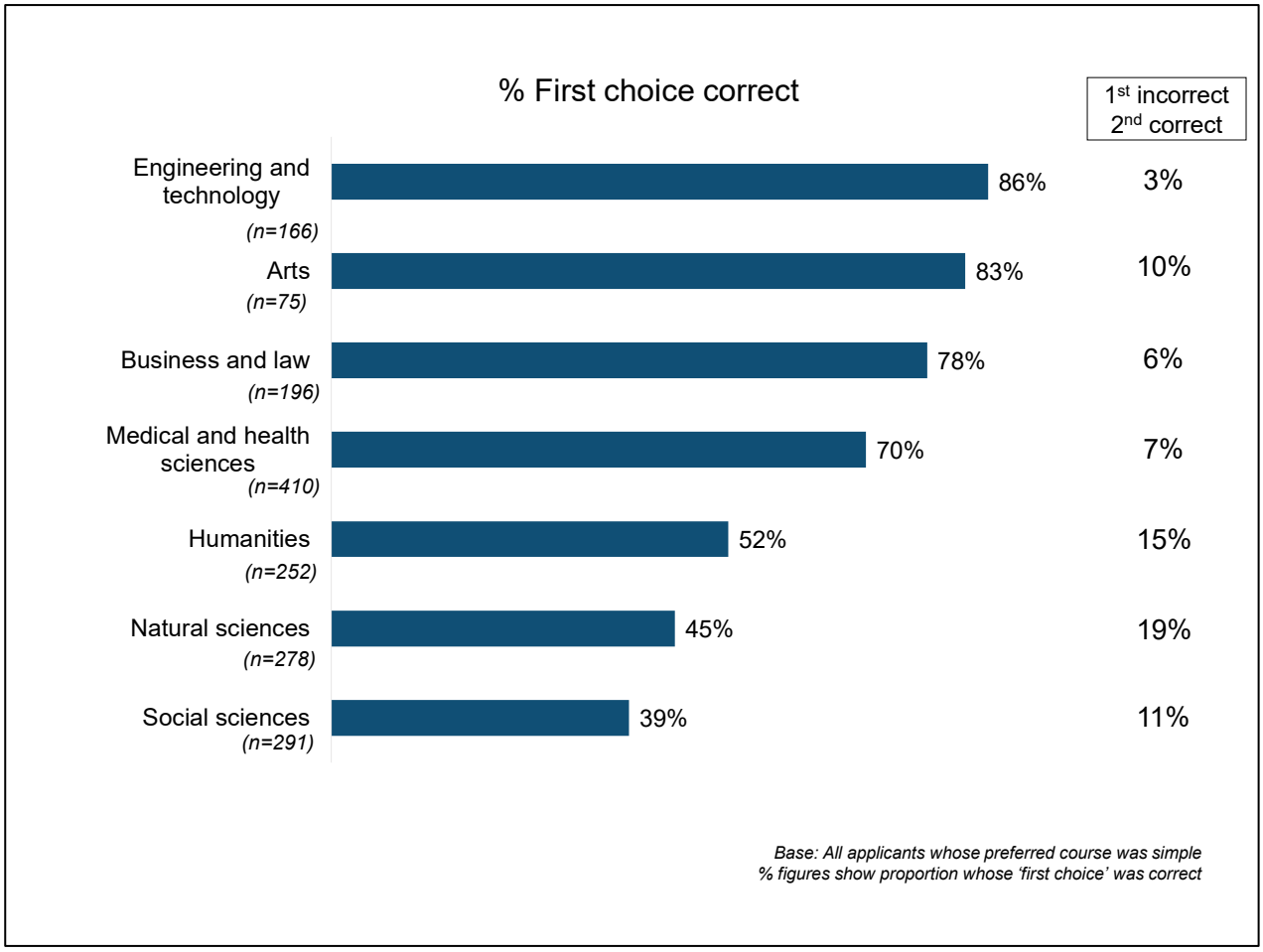
3.43 The next few subsections explore differences in accuracy, ease of use, and perceived sufficiency, by subject area for simple courses, across each of the classification systems, starting with the Broad classification.

Accuracy by subject: Broad

3.44 Overall, two-thirds of applicants (66%) were able to select the correct Broad subject area on their first choice selection and a further nine per cent correctly identified on their second choice selection. A quarter of applicants (25%) were unable to select the correct Broad subject area on either their first or second choice.

3.45 There was a considerable range in the level of accuracy for classifying to the Broad subject classification depending on applicants' preferred course. While over eight in ten applicants whose preferred course fit within the Engineering and technology (86%), and Arts (83%) subject areas correctly classified their course, around, or less than, half on Humanities (52%), Natural sciences (45%) or Social sciences (39%) courses accurately classified their preferred course. While some applicants did classify their course correctly on a second attempt, this was only a minority across all subject areas, as Figure 3.7 shows.

Figure 3.7 Proportion of applicants accurately classifying to correct Broad subject area



3.46 Exploring those subjects with poorer outcomes:

- Of those whose preferred course fit within the **Humanities** subject area, 52% classified this correctly.
    - Around one in eight applicants (15%) to a Humanities course made the correct classification on their second choice only. Most of these applicants (75%) said they would either be very or fairly likely to look up information from multiple CAH2 subject areas.
    - One-fifth (21%) of Humanities applicants incorrectly classified their preferred course as Arts, while a further 13% classified their course as Social sciences.
- Of those whose preferred course fit within the **Natural sciences** subject area, just under half (45%) selected the correct classification.
    - Nearly one in five applicants (19%) to a Natural sciences course made the correct classification on their second choice only. Around half (54%) of these applicants said that they would be very or fairly likely to look up information from multiple CAH2 subject areas.

- Over a quarter (27%) of Natural sciences applicants incorrectly classified their course as Medical and health sciences, with a further nine per cent classifying their course as Engineering and technology.

- Around two-fifths (39%) of applicants whose preferred course fit within **Social sciences** selected the correct subject area.
  - Around one in nine (11%) applicants to a Social sciences course made the correct classification on their second choice only. Just over half of these applicants (58%) said they would be fairly or very likely to look up information from multiple subject areas.
  - A variety of incorrect subject areas was chosen among Social science applicants, with Humanities (17%) the most likely to be selected. A relatively high proportion of applicants (17%) said they did not know how to classify their Social sciences course.

Incorrect classifications: Broad

3.47 This section looks at which types of courses applicants incorrectly placed in the Broad classification system. Table 3.2 shows each course categorised into CAH2, and how applicants placed the course in the Broad subject area classification (NB this table shows those on simple courses only). The 'correct' classification for each CAH2 is highlighted in blue. The table shows all CAH2 subject areas, but note there are low base sizes across some of these subject areas.

3.48 Particular areas of difficulty, highlighted in red in Table 3.2 included:

- Applicants to **Architecture, building and planning** courses; while this was a relatively low base (n=29), only a tiny minority (3%) were able to make the correct classification to Social sciences. The remainder of applicants selected Arts (45%) and Engineering and technology (47%).
- Applicants to a **Biosciences course;** one-third (32%) classified this correctly as Natural sciences, whereas a half (55%) incorrectly classified it as Medical and health sciences.
- Applicants to a **Communications and media** course; just 11% correctly classified this to Humanities. Arts was incorrectly selected by 38% of applicants, while Social sciences was selected by 27% of applicants.
- Applicants to **Economics** courses; the majority (62%) correctly classified their course to Social sciences, however there was a sizeable minority (32%) who classified their course to Business and law.
- Nearly half (48%) of applicants to an **Education and teaching** course did not know how to classify their course. Just one quarter (24%) selected the correct Broad classification (Social sciences).

- Applicants to an **English studies** course; the majority (60%) correctly classified their course to Social sciences, however there was a sizeable minority (25%) who classified their course to Arts.
- Applicants to **Geographical and environmental studies**; only nine per cent correctly classified their course to Social Sciences, with the majority selecting either Natural sciences (48%) or Humanities (37%).
- Applicants to **Mathematical sciences**; only a third (34%) correctly classified this to Natural Sciences. A further 28% incorrectly classified it as Engineering and technology.
- Applicants to **Politics** course; around half (51%) correctly classified their course to Social sciences, but a third (33%) incorrectly classified their course to Humanities.
- Applicants to a **Psychology** course; only one in five (20%) correctly classified their course to Broad Medical and health sciences with the majority (60%) incorrectly classifying this as Social sciences.

Table 3.2 Classification of each CAH2 subject area (simple courses) to Broad subject area

First correct CAH2 *Showing row percentages* *Cells in blue refer to the correct Broad subject; those in red refer to incorrect Broad subject areas selected by ≥20% of applicants, where the unweighted sample size is ≥30.*	*Base*	**Arts**	**Business and law**	**Engineering & technology**	**Humanities**	**Medical & health sciences**	**Natural sciences**	**Social sciences**	**Don't know**
Agriculture, food and related studies	*16*		4%			4%	**55%**	22%	15%
Architecture, building and planning	*29*	45%		47%				**3%**	6%
Biosciences	*82*		3%	1%		55%	**32%**	1%	8%
Business and management	*122*	2%	**81%**	2%	2%			5%	8%
Chemistry	*42*			9%		18%	**56%**		17%
Combined and general studies	*7*	16%			**32%**		19%	32%	
Communications and media	*34*	38%	8%	2%	**11%**			27%	14%
Computing	*80*	5%	5%	**78%**	1%				11%
Creative arts and design	*75*	**83%**	1%	8%	4%				5%
Economics	*47*		32%		3%			**62%**	2%
Education and teaching	*51*	7%	2%		16%	3%		**24%**	48%
Engineering	*82*	2%		**92%**		1%	1%		5%
English studies	*48*	25%			**60%**			8%	8%
Geographical & environmental studies	*46*	2%			37%		48%	**9%**	5%
Health and social care	*14*				8%	7%		**43%**	42%
History and archaeology	*64*	1	1%		**81%**		1%	4%	3%
Humanities & liberal arts (non-specific)	*2*	50%			**50%**				
Languages, linguistics and classics	*57*	14%	2%		**62%**			10%	13%
Law	*70*	1%	**70%**		11%			7%	11%
Mathematical sciences	*61*	1%	7%	28%			**34%**	12%	18%
Medicine and dentistry	*88*	1%		3%		**91%**			5%
Nursing	*61*				1%	**88%**	1%	3%	7%
Pharmacology, toxicology & pharmacy	*21*			4%		**85%**	4%		7%
Philosophy and religious studies	*23*	6%	17%		**77%**				
Physical, material & forensic sciences	*19*			5%	11%	5%	**68%**	5%	5%
Physics and astronomy	*49*			12%			**81%**	2%	5%
Politics	*42*	1%	11%		33%			**51%**	5%
Psychology	*97*	1%	1%		3%	**20%**	5%	60%	11%
Sociology, social policy & anthropology	*34*		7%		11%			**78%**	4%
Sport and exercise sciences	*23*	3%		3%		**37%**	8%	16%	33%
Subjects allied to medicine not otherwise specified	*78*	1%		1%	1%	**76%**	2%	6%	14%
Technology	*4*			**74%**	26%				
Veterinary sciences	*37*					**75%**	13%		12%

Note – there were no applicants to Celtic Studies or General and others in sciences

Ease of use and sufficiency by subject: Broad

3.49 In line with the accuracy outcomes, those applying to a Humanities (38%) or Natural sciences (36%) course were least likely to report that the Broad classification provided them with a sufficient amount of information to help them choose where to study (compared with an overall figure of 46%).

3.50 In terms of ease of use, once again those applying to a Humanities course were least likely to report that the Broad classification was easy to use (54% compared with 63% overall). Table 3.3 presents the key measures by Broad subject.

Table 3.3 Summary of key measures by Broad subject (simple courses)

Preferred Broad	*Base*		Accuracy	Easy to use (6-10/10)	Difficult to use (0-5/10)	Sufficient
Engineering and technology	166	%	86	74	16	45
Arts	75	%	83	67	29	47
Business and law	196	%	78	66	31	53
Medical and health sciences	410	%	70	63	33	48
Humanities	252	%	52	52	44	38
Natural sciences	278	%	45	61	33	36
Social sciences	291	%	39	60	36	48

Figures are based on simple courses only.

Subject-specific analysis: CAH1 classification system

Accuracy by subject: CAH1

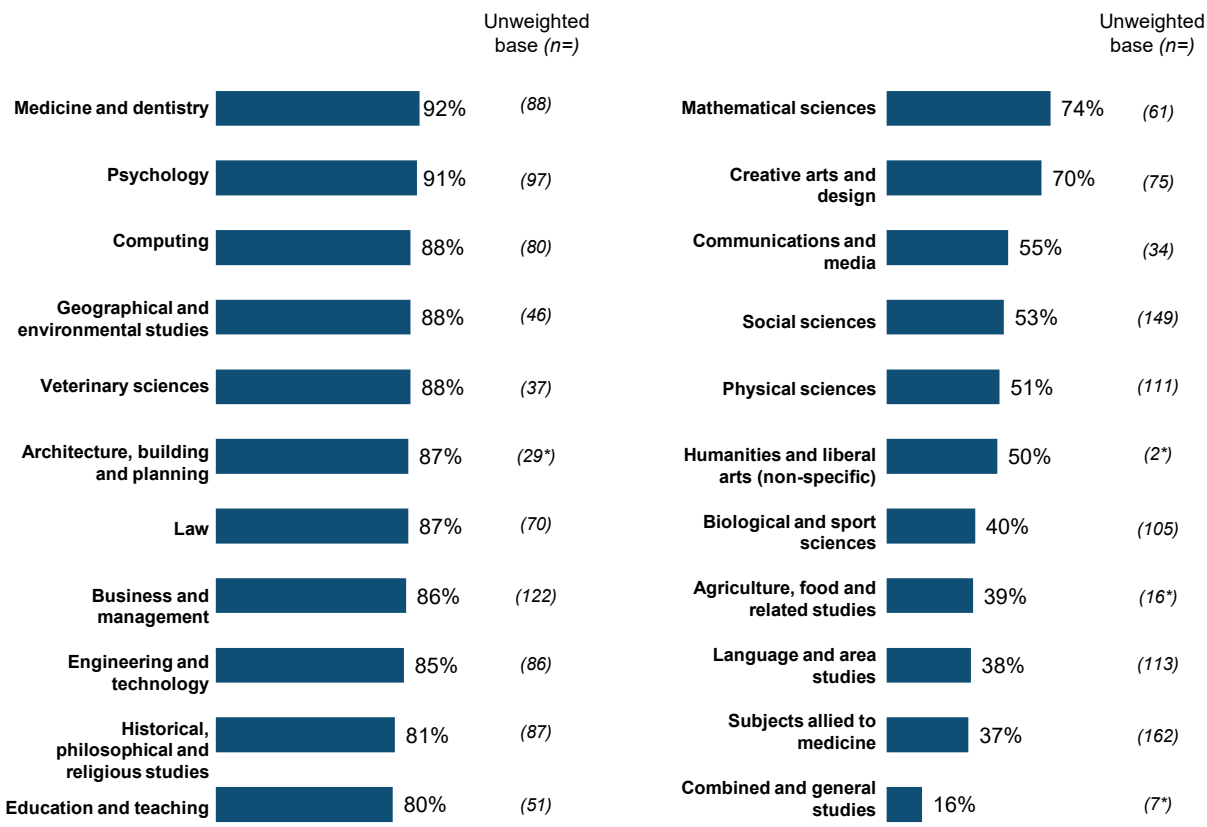
3.51 The majority of applicants were able to select the correct CAH1 classification for their preferred simple course, on the first selection (68%). A further seven per cent of applicants were able to identify the correct CAH1 on their second choice selection, while one quarter (25%) were not able to select the correct classification on either their first or second choice selection.

3.52 Applicants were most accurate in selecting Medicine and dentistry courses (92%), followed by Psychology (91%), Computing, Geographical and environmental studies, and Veterinary sciences (88% each).

3.53 There were a handful of subject areas that were particularly difficult for applicants to identify. Among subject areas with a base of at least 30, less than half were able to correctly classify to the following subject areas: Biological and sports sciences course (40%), Language and area studies (38%), and Subjects allied to medicine (37%).

3.54 Figure 3.8 shows the proportion of applicants accurately selecting each CAH1 classification.

Figure 3.8 Proportion of applicants accurately classifying to correct CAH1 subject area



*Base: All applicants on simple courses. Unweighted base size in brackets. *=very low base <30.*
No applicants among the survey sample had a preferred CAH1 course that fitted into 'General and others in sciences'.

Ease of use and sufficiency by subject: CAH1

3.55 The proportion citing that CAH1 was a sufficient form of classification ranged from 43% to 78% by subject area (against an average of 58%). The two CAH1 subject areas lower than average were Language and area studies, and Physical sciences (both 49%)[11].

3.56 Ease of use scores ranged more widely; of those with a base size of at least 30, applicants to Biological and sport sciences (58%), Social sciences (59%), Subjects allied to medicine (61%) courses all returned lower scores than average for CAH1 (67%). Table 3.4 presents the key measures by CAH1.

[11] Agriculture, food and related studies returned a sufficiency measure of 43%, but as the base is 16 the finding is not statistically significant.

Table 3.4 Summary of key measures by CAH1 (simple courses)

Preferred CAH1	*Base*		Accuracy	Easy to use (6-10/10)	Difficult to use (0-5/10)	Sufficient
Medicine and dentistry	88	%	92	85	10	41
Psychology	97	%	91	72	26	47
Computing	80	%	88	78	12	36
Geographical and environmental studies	46	%	88	85	13	42
Veterinary sciences	37	%	88	74	15	42
Architecture, building and planning	29	%	87	83	14	54
Law	70	%	87	82	18	60
Business and management	122	%	86	64	28	50
Engineering and technology	86	%	85	75	17	51
Historical, philosophical and religious studies	87	%	81	78	21	38
Education and teaching	51	%	80	71	24	44
Mathematical sciences	61	%	74	76	23	22
Creative arts and design	75	%	70	65	28	47
Communications and media	34	%	55	54	42	44
Social sciences	149	%	53	59	36	50
Physical sciences	111	%	51	70	24	33
Humanities and liberal arts (non-specific)	2	%	50	0	50	50
Biological and sport sciences	105	%	40	58	35	41
Agriculture, food and related studies	16	%	39	43	41	43
Language and area studies	113	%	38	65	32	35
Subjects allied to medicine	162	%	37	60	36	53
Combined and general studies	7	%	16	25	59	25
General and others in sciences	-	%	-	-	-	-

Figures are based on simple courses only.

Subject-specific analysis: CAH2 classification system

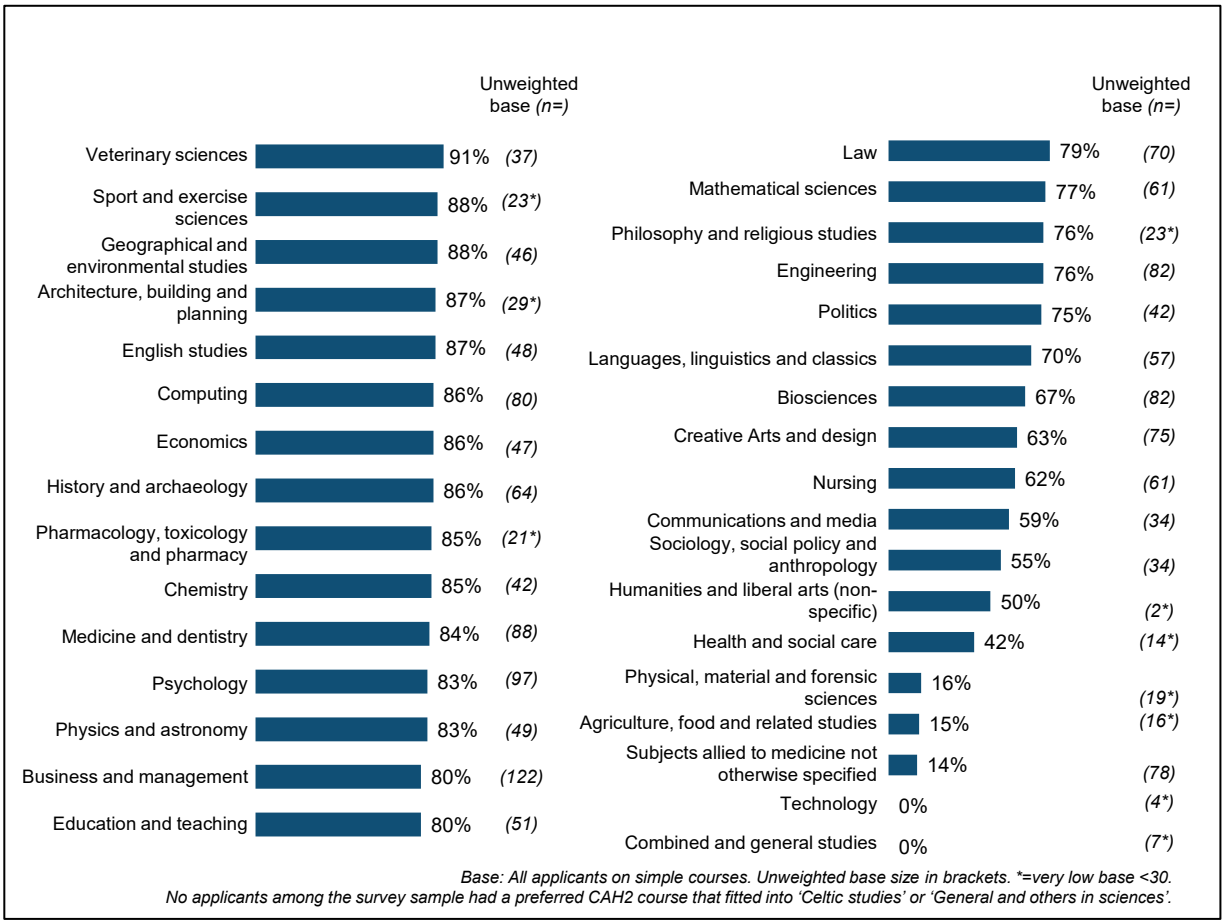
3.57 Earlier sections of this chapter have provided evidence at an overall level for the use of CAH2 as a suitable subject-level classification. The following section explores further the suitability of CAH2 by looking at the key measures by subject area.

Accuracy by subject: CAH2

3.58 The majority of applicants were able to correctly identify the CAH2 subject area for their preferred course; for 21 of 33 subject areas, at least 70% of applicants were able to correctly classify their course[12]. Among subject areas with a base of at least 30, applicants to Communications and media (59%), Sociology, social policy and anthropology (55%) and Subjects allied to medicine not otherwise specified (14%) courses struggled most to classify to the correct CAH2, as Figure 3.9 shows.

3.59 Although at an overall level the majority of applicants were able to select the correct CAH2 subject area, around one third of applicants each to Biosciences (33%), Creative arts and design (37%) and Nursing (38%) courses were not able to select the correct CAH2 for their preferred course.

Figure 3.9 Proportion of applicants accurately classifying to correct CAH2 subject area



*Base: All applicants on simple courses. Unweighted base size in brackets. *=very low base <30.*
No applicants among the survey sample had a preferred CAH2 course that fitted into 'Celtic studies' or 'General and others in sciences'.

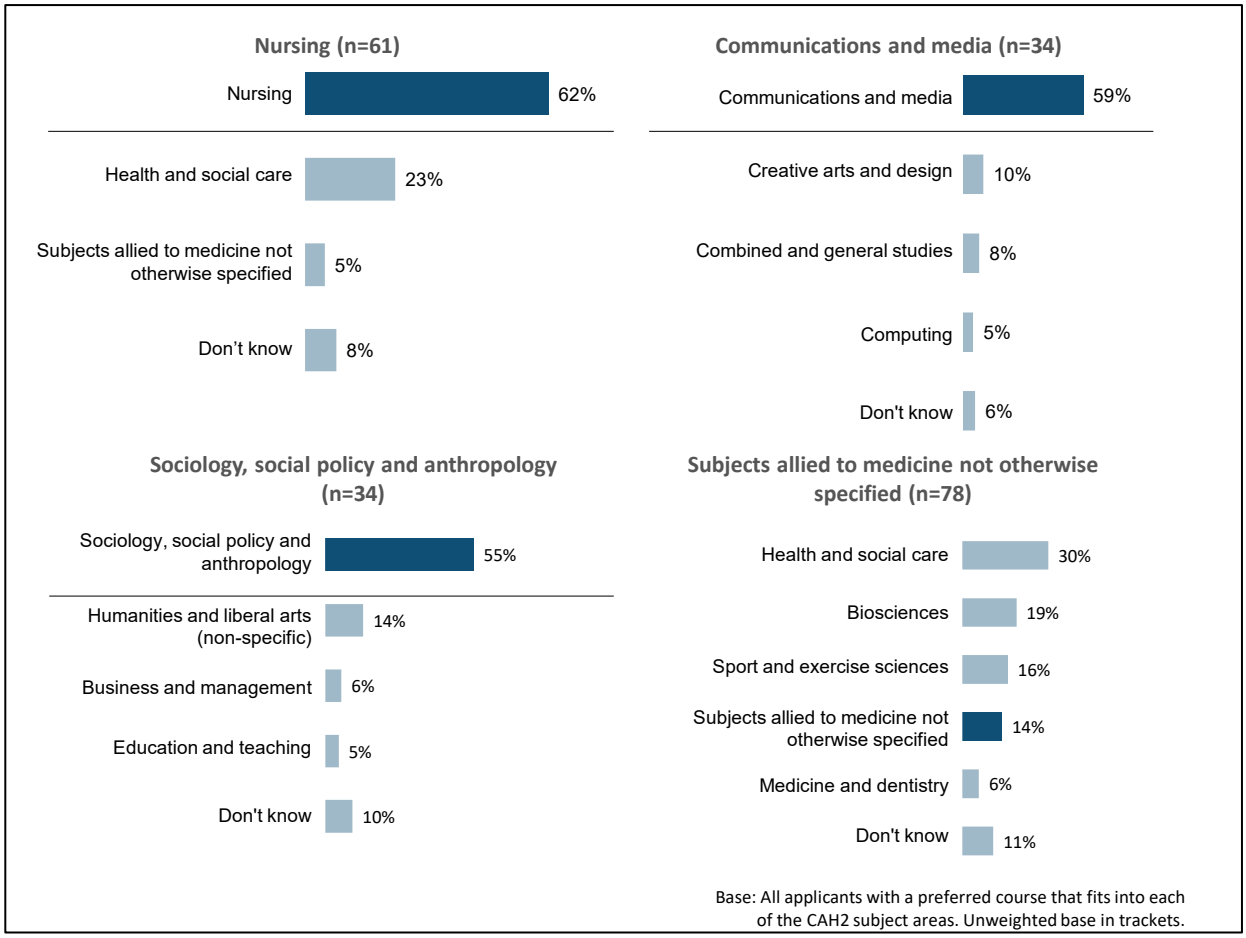
[12] The sample of applicants had preferred courses that could be mapped onto 33 of the 35 CAH2 subject areas. No applicants in the sample had a preferred course that mapped onto CAH2 subject area 'Celtic studies' or 'General and others in sciences'.

Incorrect classifications: CAH2

3.60 Figure 3.10 shows the varied classification routes made by applicants to the following courses: Nursing; Communications and media; Sociology, social policy and anthropology; and Subjects allied to medicine not otherwise specified.

- Six in ten (62%) applicants to a **Nursing** course correctly selected this CAH2 subject area. Despite this, around a quarter (23%) incorrectly identified their course as belonging to Health and social care.
- Among applicants whose preferred course fitted into **Communications and media**, around six in ten (59%) selected the correct CAH2 subject area. Despite this, a range of other subject areas were chosen, with Creative arts and design (10%) and Combined and general studies (8%) most commonly selected.
- Among applicants whose preferred course fitted into **Sociology, social policy and anthropology**, just over half (55%) selected the correct CAH2 subject area. A range of other subject areas were chosen; the most common incorrect subject area was Humanities and liberal arts (non-specific) (14%).
- Among applicants whose preferred course fitted into **Subjects allied to medicine**, just 14% selected the correct subject area. A range of other subject areas were incorrectly selected, with 30% selecting Health and social care, 19% Biosciences and 16% Sport and exercise sciences.

Figure 3.10 CAH2 Incorrect classification routes



3.61 For two other subject areas where less than 70% of applicants correctly identified the correct CAH2 (and with a base of at least 30) the cause of inaccuracy related more to applicants not knowing which CAH2 subject area would fit their preferred course, rather than the misclassification to an incorrect CAH2 subject area. One in five (19%) applicants to a Creative arts and design course and 14% of applicants to a Biosciences course said they did not know how to classify their course using the CAH2 classification.

3.62 There were also a handful of courses where the clear majority of applicants were able to make accurate subject area classifications using CAH2, however a small minority incorrectly classified their course to particular CAH2 subject areas.

- The majority of applicants to a **Psychology** course selected the correct CAH2 subject area (83%), however a further eight per cent incorrectly selected Health and social care.

- The majority of applicants to an **Architecture, building and planning** course[13] selected the correct CAH2 subject area (87%), however one in nine (11%) incorrectly classified their course to CAH2 subject area Engineering.
- Three-quarters (75%) of applicants to a **Politics** course selected the correct CAH2 subject area, however a further one in ten each incorrectly selected Geographical and environmental studies (8%) and Humanities and liberal arts (non-specific) (10%).
- While 70% of applicants to a **Languages, linguistics or classics** course selected the correct CAH2 subject area, a further eight per cent incorrectly selected Humanities and liberal arts (non-specific).

3.63 The full breakdown of course classification by CAH2 subject area is shown in Table A.1.3 in Appendix A.

Key measures by CAH2 subject area

3.64 It is useful to consider the accuracy measure alongside sufficiency and ease of use. There were several (simple) courses where results across the three measures were particularly conflicting.

- Only 14% of applicants to a **Subjects allied to medicine not otherwise specified** course selected the correct CAH2 subject area. However, the majority of applicants (59%) said they found the CAH2 classification easy to use (rating 6 / 10 or greater) and that they would find a CAH2 level award sufficient (60%).
- The majority of applicants (80%) to a **Business and management** course correctly identified this using CAH2. However, far fewer found the CAH2 classification easy to use (59%), and sufficient (60%)
- 88% of applicants to a **Geographical and environmental studies** course correctly identified this using CAH2, but far fewer actually found this classification sufficient (52%).
- 87% of applicants to an **English studies** course correctly identified this in CAH2, but less than half (45%) of applicants to this course said they found the CAH2 classification sufficient.
- The majority of applicants to a **Creative arts and design** course found the CAH2 classification easy to use (70%) but fewer said they would find it sufficient (50%).

[13] Low sample size for Architecture, building and planning: 29

3.65 Table 3.5 presents the key measures across all CAH2 subject areas for simple courses.

Table 3.5 Summary of key measures by CAH2 (simple courses)

Preferred CAH2	*Base*		Accuracy	Easy to use (6-10/10)	Difficult to use (0-5/10)	Sufficient
Veterinary sciences	*37*	*%*	91	76	15	81
Geographical and environmental studies	*46*	*%*	88	78	20	52
Sport and exercise sciences	*23*	*%*	88	68	24	49
Architecture, building and planning	*29*	*%*	87	80	20	80
English studies	*48*	*%*	87	77	18	45
Computing	*80*	*%*	86	75	11	61
Economics	*47*	*%*	86	73	24	81
History and archaeology	*64*	*%*	86	74	22	64
Chemistry	*42*	*%*	85	74	13	61
Pharmacology, toxicology & pharmacy	*21*	*%*	85	51	49	56
Medicine and dentistry	*88*	*%*	84	76	18	61
Physics and astronomy	*49*	*%*	83	92	6	69
Psychology	*97*	*%*	83	70	28	64
Business and management	*122*	*%*	80	59	34	60
Education and teaching	*51*	*%*	80	70	27	68
Law	*70*	*%*	79	74	22	70
Mathematical sciences	*61*	*%*	77	81	8	75
Engineering	*82*	*%*	76	64	29	53
Philosophy and religious studies	*23*	*%*	76	84	16	52
Politics	*42*	*%*	75	81	13	64
Languages, linguistics and classics	*57*	*%*	70	74	19	71
Biosciences	*82*	*%*	67	68	24	62
Creative arts and design	*75*	*%*	63	70	21	50
Nursing	*61*	*%*	62	62	31	59
Communications and media	*34*	*%*	59	46	50	52
Sociology, social policy & anthropology	*34*	*%*	55	51	36	59
Humanities & liberal arts (non-specific)	*2*	*%*	50	0	50	50
Health and social care	*14*	*%*	42	60	37	48
Physical, material and forensic sciences	*19*	*%*	16	63	37	63
Agriculture, food and related studies	*16*	*%*	15	62	22	57
Subjects allied to medicine not otherwise specified	*78*	*%*	14	59	38	60
Combined and general studies	*7*	*%*	0	51	32	59
Technology	*4*	*%*	0	52	22	52
Celtic studies	*0*	*%*	-	-	-	-
General and others in science	*0*	*%*	-	-	-	-

Figures are based on simple courses only.

3.66 Earlier in the chapter, two key groups were identified; those applicants who answered their CAH2 subject area correctly but who may have had difficulty doing

so, or indeed may have answered more by chance than design (15%); and those who considered selecting their CAH2 subject to be an easy process, but selected the wrong subject area, suggesting a certain level of misplaced confidence when considering subject areas (14%).

3.67 Applicants to courses in Business and management (29%), Economics (22%) and Psychology (20%) were most likely to have accurately classified their course but reported they had difficulty doing so, while applicants to Nursing (18%), Biosciences (17%) and Creative arts and design (17%) were most likely to have selected the wrong subject area, but reported the process as being easy.

Reasons for misclassifying CAH2

3.68 In order to better understand why applicants did not classify their course to the correct CAH2 subject area, all those who incorrectly classified their course were shown the correct subject area and asked why they did not select this option. Additionally, all applicants were shown a list of CAH2 subject areas that might be relevant to them (based on their preferred course) and asked to comment on any subject areas which were unclear to them.

3.69 While applicants returned feedback on most subject areas, for the purposes of this report we have selected the following six to explore in detail here, based on their low accuracy scores:

- Biosciences
- Sociology, social policy and anthropology
- Nursing
- Subjects allied to medicine not otherwise specified
- Creative arts and design
- Communications and media.

Biosciences (Accuracy: 67%)

3.70 Some applicants felt that the term “biosciences” is too broad. The distinction between biology and chemistry may not be clear to some due to the interdisciplinary nature of both subjects and the perceived overlap between the remit of different sciences.

“The term seems to be too general and vague to figure out what courses fit under this classification.”

Applicant to BSc in Biomedical Sciences – correct CAH2: Biosciences - first choice correct, second choice incorrect – expressed uncertainty about Biosciences.[14]

"What is included as biosciences?"
Applicant to BSc in Pharmacology – correct CAH2: Biosciences –first choice incorrect, second choice correct – expressed uncertainty about Biosciences.

3.71 The prefix 'bio' also created issues for applicants, especially where they have a lot of flexibility when choosing their modules. This allows applicants to avoid aspects of their courses that might be traditionally be considered to relate to biology, and thus they might not associate their course with 'Biosciences'.

"It is not a subject I would study. My interests are the physical natural sciences and not biology and medicine. I will not be studying this subject if I take the course."
Applicant to BA in Natural Sciences – correct CAH2s: Subjects allied to medicine not otherwise specified, Biosciences and Physical, material and forensic sciences – incorrect subject classification – misclassified their course.

"Physical sciences and biology differ fairly significantly in terms of teaching and facilities."
Applicant to Science Foundation – correct CAH2s: Biosciences, Physical, material and forensic sciences and Combined and general studies - incorrect subject classification – misclassified their course.

Creative arts and design (Accuracy: 63%)

3.72 Those who incorrectly classified their Creative arts and design course tended to select the 'Don't know' option when asked to choose their CAH2 subject area. This suggests that a small adjustment to the wording of this particular subject area should help to resolve uncertainty.

3.73 Applicants to musical courses were particularly likely to express issues with the inclusion of their course in this CAH2. This is linked to perceptions that creative arts and design mainly refers to courses that are less performative than music.

"Generally I think 'creative arts and design' refers more to subjects such as graphics or media rather than music."

[14] These descriptions have been provided to give context to the quotes that they accompany. They detail the course to which the applicant is applying, which CAH2 subject area(s) this course is correctly classified within, whether the applicant correctly classified their course in the survey and whether the quote was provided when the applicant incorrectly classified their course, or when they were asked if they were unclear about any CAH2 subject areas that were deemed to be similar to their own subject area.

Applicant to BA in Music – correct CAH2: Creative arts and design – don't know – misclassified their course.

"I feel music should have its own category."
BSc in Music and Sound Technology – correct CAH2: Creative arts and design – don't know – misclassified their course.

3.74 Some applicants to performative courses such as dancing and acting also expressed surprise at the inclusion of their course within this classification.

"I didn't realise it would categorise my choice of study, acting, in that area."
Applicant to BA in Acting – correct CAH2: Creative arts and design – first choice incorrect, second choice incorrect – misclassified their course.

"I think the way other creative arts courses are taught can be very different to a specific course in performance."
Applicant to BA in Modern Ballet – correct CAH2: Creative arts and design – don't know – misclassified their course.

Nursing (Accuracy: 61%)

3.75 Amongst applicants to courses classified under the CAH2 'Nursing', the most common concern was that the title of the classification does not include any information regarding midwifery; some considered that midwifery was not a form of Nursing and could not be subsumed within a category labelled as such.

"Nursing is not synonymous with midwifery."
Applicant to BSC in Midwifery – correct CAH2: Nursing – first choice incorrect, second choice incorrect – misclassified their course.

3.76 There was also some confusion about whether 'nursing' included veterinary nursing, with a handful of applicants stating they were unsure where the boundaries of the CAH2 classification were drawn.

"Is this just human nursing?"
Applicant to Veterinary Medicine including a gateway year– correct CAH2: Veterinary sciences – first choice correct, second choice incorrect – misclassified their course.

Communications and media (Accuracy: 59%)

3.77 Some applicants expressed the view that it was hard to think of specific courses that fell within this classification, citing the terminology as being too vague.

"What does this involve? What are the actual core studied subjects?"

Applicant to BA in Philosophy and Theology – correct CAH2: Philosophy and religious studies – first choice correct, second choice incorrect - expressed uncertainty about Communications and media.

"Media I somewhat understand. I don't know what subjects 'communications' spans, however."
Applicant to BA in English – correct CAH2: English studies – first choice correct, second choice incorrect - expressed uncertainty about Communications and media.

3.78 The term 'communications' was also considered to be quite broad; one applicant considered quite technological aspects, such as phone lines, while another queried whether one could consider theatre studies as a form of 'communications'.

"Does this refer to advertising, film studies, maintaining phone lines? It could be a little clearer."
Applicant to BA in English Literature – correct CAH2: English studies – first choice correct, second choice correct - expressed uncertainty about Communications and media.

"I don't understand what degree you could do with this sort of thing... Would theatre be included?"
Applicant to BA in Languages – correct CAH2: Languages, linguistics and classics – first choice correct, second choice correct - expressed uncertainty about Communications and media.

Sociology, social policy and anthropology (Accuracy: 55%)

3.79 Applicants not applying specifically to a degree that contained one of these terms within their course name considered the subject area quite broad, and vague.

"It is a very wide subject area so I'm not sure about the content."
Applicant to BSc in Economics – correct CAH2: Economics – first choice correct, second choice incorrect - expressed uncertainty about Sociology, social policy and anthropology.

"Social policy - what area would that link to? It sounds broad and it's not a common subject, so not many people may have heard of it."
Applicant to Geography – correct CAH2: Geographical and environmental studies – first choice correct, second choice incorrect - expressed uncertainty about Sociology, social policy and anthropology.

3.80 A number of applicants were also unfamiliar with the terms, or considered them to be quite 'technical'.

"The anthropology part – I'd need to research what it consists of."

Applicant to BSc Arts and Social Sciences – correct CAH2s: Politics and Economics – incorrect subject classification - expressed uncertainty about Sociology, social policy and anthropology.

"I am unfamiliar with these subjects."
Applicant to BA in Architecture – correct CAH2: Architecture, building and planning – first choice correct, second choice correct - expressed uncertainty about Sociology, social policy and anthropology.

3.81 Amongst applicants to courses that are currently included within the CAH2 classification 'Sociology, social policy and anthropology', applicants to criminology courses particularly feel that their course is incorrectly classified. These applicants often reference their belief that it should be included within the same classification as law.

"I did not think that Criminology was classed as a social policy, it was not clear."
Applicant to BSc in Criminology and Psychology – correct CAH2s: Sociology, social policy and anthropology and Psychology – part correct CAH2 classification - misclassified their course.

"In many universities I have looked at, Criminology has come under law."
Applicant to BSc in Criminology – correct CAH2: Sociology, social policy and anthropology – first choice correct, second choice correct – misclassified their course.

Subjects allied to medicine not otherwise specified (Accuracy: 14%)

3.82 Many applicants felt that the term is simply too vague, with some querying what types of course this might include.

"What subjects are these? I don't know, so I don't see why everyone would know what subjects are in this category."
Applicant to BSc in Physiotherapy – correct CAH2: Subjects allied to medicine not otherwise specified – first choice correct, second choice correct - expressed uncertainty about Subjects allied to medicine not otherwise specified.

"Too general and broad, it is not specific enough."
Applicant to BVSc in Veterinary Science – correct CAH2: Veterinary sciences – first choice correct, second choice incorrect - expressed uncertainty about Subjects allied to medicine not otherwise specified.

3.83 A number of applicants also considered that any course that might be included here should already be adequately covered within more specific CAH2 subject areas. They therefore felt this subject area was unnecessary.

"[I am] unsure which subjects that are allied to medicine are not included in Nursing or Medicine."

Applicant to BSc in Veterinary Physiotherapy – correct CAH2: Veterinary sciences – first choice correct, second choice incorrect – expressed uncertainty about Subjects allied to medicine not otherwise specified.

"There is no suggestion to what this is related to; Medicine, Dentistry and Nursing are already covered."
Applicant to BSc Criminology and Psychology – correct CAH2s: Sociology, social policy and anthropology and Psychology – part correct CAH2 classification – expressed uncertainty about Subjects allied to medicine not otherwise specified.

3.84 A common theme among applicants whose courses are technically classified within Subjects allied to medicine not otherwise specified was that their course had little affiliation to medicine. This was particularly pronounced among applicants to courses related to food and nutrition, physiotherapy and sports science.

"I don't feel that food science is relevant to medicine"
Applicant to Food Science and Nutrition – correct CAH2s: Subjects allied to medicine not otherwise specified and Agriculture, food and related studies – Part correct CAH2 classification – misclassified their course.

"I believe that the food undergraduate course is more technical and vocational rather than subjects allied to medicine which has academic connotations."
Applicant to BSc in Food and Nutrition – correct CAH2s: Subjects allied to medicine not otherwise specified and Agriculture, food and related studies – Part correct CAH2 classification – misclassified their course.

"My passion is with sport and exercise science more than anything else and I understand psychology as a subject. I don't enjoy the medicine side of it."
Applicant to BSc in Exercise Science – correct CAH2: Subjects allied to medicine not otherwise specified – first choice incorrect, second choice incorrect – misclassified their course.

"Physio is not medicine."
Applicant to BSc in Physiotherapy – correct CAH2: Subjects allied to medicine not otherwise specified – first choice incorrect, second choice incorrect – misclassified their course.

3.85 Finally, some also considered that the classification covered similar territory as the CAH2 Biosciences subject area, particularly among those applying to a biomedical sciences course.

"In universities' websites biomedical sciences are categorized as biosciences."
Applicant to Biomedical Sciences – correct CAH2: Subjects allied to medicine not otherwise specified – first choice incorrect, second choice incorrect – misclassified their course.

Subject classification by demographic subgroups

3.86 The preceding sections of this chapter have provided evidence across the key measures that generally support the primary hypothesis that CAH2 is the most suitable subject-level classification system, due in particular to its higher accuracy measures and returning the highest 'sufficiency' percentages. As this section illustrates, this also holds across most demographic and institutional subgroups, with only minor deviations from the overall pattern. It should also be noted that the differences by subgroup are to a large extent underpinned by the different subject area profile of each subgroup.

3.87 The accuracy measure explored in this section is based on applicants to simple courses only, whereas the ease of use and sufficiency measures are based on applicants to both simple and complex courses.

3.88 Variations to the overall pattern by demographics are summarised below, with more detail contained in Figures A.3.1 to A.3.6 in Appendix A. In this section, 'differences' between subgroups are **not statistically significant** unless explicitly stated.

Age

3.89 By age, slightly more applicants over 19 years old found CAH1 and Broad classifications easier to use than CAH2. A slightly higher proportion also considered CAH1 to be most sufficient for determining the quality of their course.

Ethnicity

3.90 White applicants tended to appear slightly more favourable towards CAH2 than BME applicants. While both White and BME applicants were most accurate using the CAH2 classification, BME applicants tended to find CAH1 as easy to use and as sufficient as CAH2.

POLAR quintile

3.91 The one difference of note by POLAR quintile was that applicants from a POLAR quintile 1 background (i.e. the most disadvantaged quintile) were less likely to accurately classify their course within the CAH1 classification system, compared with Broad and CAH2, and were statistically significantly more likely to accurately classify their course to CAH2 than CAH1.

Parental degree status

3.92 Applicants whose parents had a degree were more likely to make correct classifications using each of the systems, compared to applicants whose parents did not have a degree. However, there was little difference across the other measures between those whose parents had a degree and those whose parents did not.

Special educational needs (SEN) and disabilities

3.93 Applicants with special educational needs (SEN) found the Broad classification easiest to use, and the CAH2 most difficult. Otherwise their responses were generally consistent with those without special educational needs.

3.94 Applicants with disabilities showed little difference in their responses to those without disabilities.

Domicile

3.95 Applicants based outside of the UK showed a slightly greater preference for CAH1, with a slightly higher proportion selecting the correct subject area than when using CAH2 and statistically significantly more applicants finding CAH1 easier to use than CAH2. However, more non-UK applicants found CAH2 sufficient when compared to CAH1, in line with UK applicants.

Degree level

3.96 Applicants to lower level undergraduate degrees, categorised as being below Level 6, on the whole were not notably different to applicants to Level 6 degree courses. However, applicants to lower level degrees were least accurate when categorising their course to CAH1 subject areas. Conversely, applicants to lower level degrees were also more likely to find that CAH1 provided sufficient information when deciding where to study.

Applicant status

3.97 There was little difference in accuracy by whether an individual had submitted their application; however, in general those who were yet to submit their application found all classifications less easy to use than those who had. Individuals who were yet to submit their application were equally as likely to find CAH1 and CAH2

sufficient, whereas individuals who had submitted their application found CAH2 to be most sufficient.

Higher Education provider tariff status

3.98 Applicants to high tariff HE Providers were more likely to be accurate across all three subject classifications, compared to applicants to medium / low tariff HE providers. Among applicants to medium / low tariff HE providers, there was little difference in accuracy and sufficiency between CAH1 and CAH2, whereas the pattern for applicants to high tariff providers is in line with other applicants.

Higher Education provider location

3.99 Applicants to HE providers in Northern Ireland were most accurate using Broad, yet tended to find CAH1 the easiest to use. The results for sufficiency are in line with other applicants.

3.100 While applicants to HE providers in Scotland were most accurate using CAH2, they tended to find CAH1 the easiest to use and found CAH1 as sufficient as CAH2.

3.101 While applicants to HE providers in Wales found CAH2 most sufficient, they tended to find CAH1 the easiest to use and CAH1 and CAH2 to be sufficient to a similar extent.

3.102 Among applicants to HE providers in England, there was little difference in accuracy between CAH1 and CAH2, yet they were most likely to find CAH2 easiest to use and most sufficient.

HE Provider type

3.103 The base number of respondents for alternate providers and further education colleges was insufficient to perform substantive subgroup analysis amongst higher education providers of different types.

4 Teaching Quality and Student Outcome Factors

Introduction

4.1 It is important that the teaching quality and student outcome factors used in the TEF are relevant and meaningful to future applicants to HE Providers. The Government has a commitment to ongoing development of the TEF and to ensure that as we move towards subject-level TEF, the design is informed by a thorough evidence base. This research, which has been undertaken alongside the pilots and consultation about subject-level TEF, is a part of that commitment. This part of the research therefore explores the relative importance of a range of teaching quality and student outcome factors in Higher Education from the perspective of both applicants and current students.

4.2 The key questions that this chapter aims to answer about the teaching quality and student outcome factors are:

- Which factors are most important to applicants when deciding where to study?
- Which factors are most important to students in influencing the overall quality of undergraduate experience?
- Which factors are key drivers of overall student satisfaction?

4.3 Twenty different teaching quality and student outcome factors (see Table 4.1) were presented to 984 Higher Education applicants and 1,050 first and second year undergraduate students. Applicants were asked to consider the relative importance of each factor in **deciding where to study** while students were asked to consider the relative importance of each factor in influencing **the overall quality of their undergraduate experience**.

Table 4.1 Teaching quality and student outcome factors presented to applicants and students[15]

Teaching staff factors	Course factors	Graduate outcomes	Wider opportunities
Whether teaching staff are inspiring and engaging	Whether students are able to specialise deeply in one subject	Whether students get graduate level jobs after they graduate	Whether students are exposed to and involved with employers, industry and workplace
Whether the institution is committed to continuous improvement in teaching	Whether students are able to study a variety of subjects	Whether the course leads to a professional qualification	Whether students are exposed to and involved in enterprise, innovation and entrepreneurship
Whether teaching staff are leading experts in industry or business	Whether academic standards are rigorous and stretching	Whether the course boosts students' earning potential	Whether students are exposed to and involved in cutting edge ideas and research
Whether teaching staff have high level academic qualifications such as PhDs	Whether there are good resources and facilities available to students	Whether students improve their transferable soft skills	
Whether teaching staff have teaching qualifications	Whether students give positive feedback (about the teaching and experience of studying at that provider)		
Whether teaching staff are on permanent contracts	Whether students receive a high number of contact hours		
	Whether students are taught in small class sizes		

[15] Table 4.1 shows the full text for the factors shown in the section of the questionnaire testing the relative importance of factors. In addition to this, hover-over text was available providing a more detailed description of each factor. The hover-over text for each factor is presented in Table A.4.1 in Appendix A

4.4 MaxDiff trade-off analysis was used to determine the relative importance of each factor. Each applicant and student was presented with 15 sets of factors, with each set containing four different factors. Within each set, participants were prompted to select the most important and the least important factor.

4.5 In doing so, each participant revealed a series of preferences regarding the relative importance of the factors in each set[16]. Using this information, an importance score was calculated algorithmically for each factor[17]. This score represents the relative importance of that factor compared to other factors.

4.6 In addition to this trade-off analysis, a regression analysis was conducted to determine the key drivers of student satisfaction. The dependent variable was students' satisfaction with their overall undergraduate experience and the independent variables were satisfaction levels with each of the twenty teaching quality and student outcome factors outlined above.[18]

Which factors are considered most important among applicants?

4.7 This section discusses the results of the trade-off analysis conducted among HE applicants. Instead of measuring the absolute importance of teaching quality and student outcome factors, this analysis measures the relative importance of these factors to applicants when deciding where to study.

4.8 An importance score of 1.00 represents average importance for the twenty factors; a score of 2.00 can be interpreted as double the average importance and a score of 0.50 represents half the average importance.

4.9 As shown in Figure 4.1, the factors considered to be most important by HE applicants when deciding where to study were the likelihood of securing a graduate level job (2.40 times more important than average), exposure to employers, industry and workplaces (2.19), and whether or not teaching staff are inspiring and engaging (1.94).

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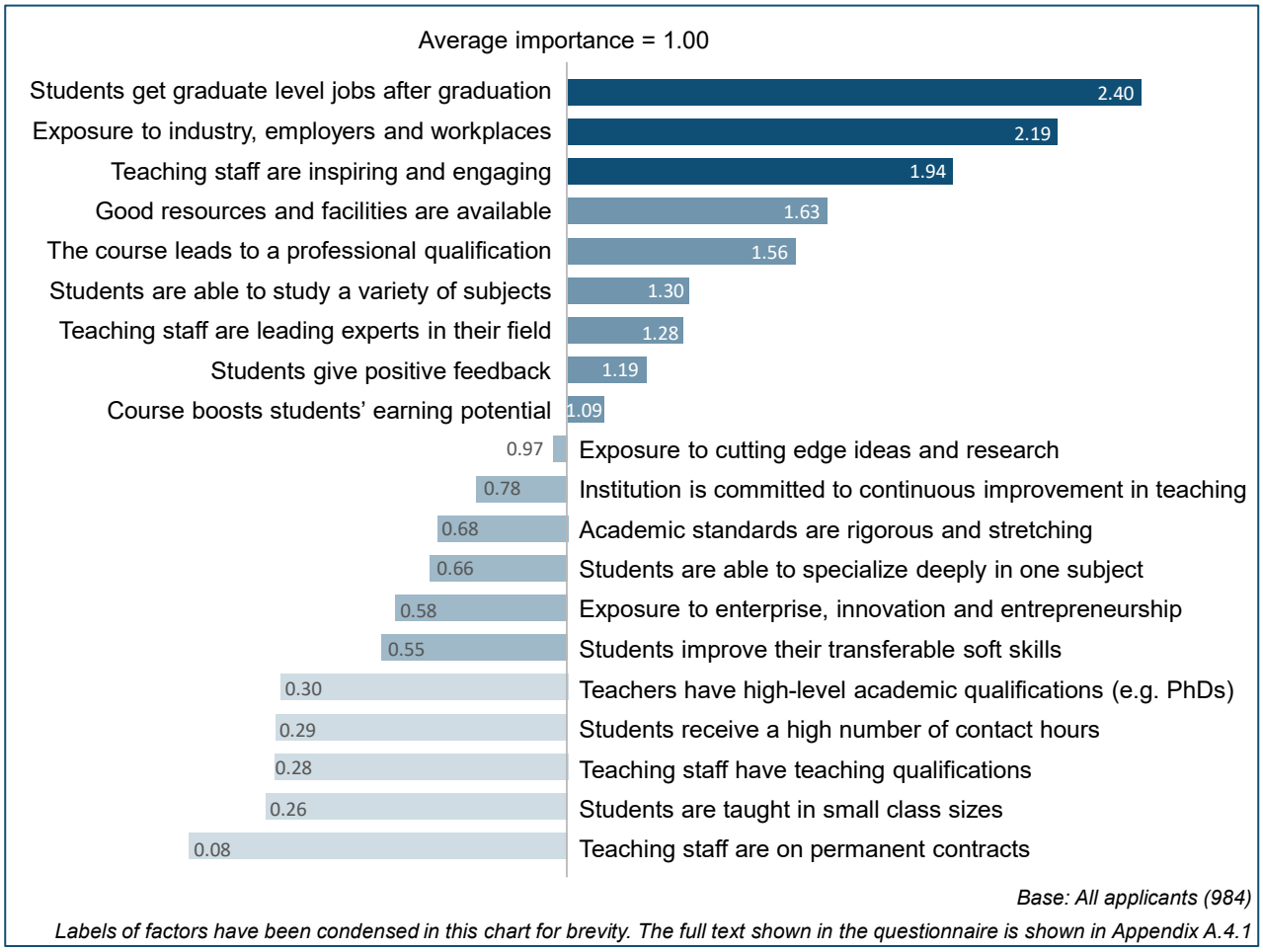
[16] For example, if a respondent is presented with four options (A, B, C, D) and chooses B as 'most important' and D as 'least important', the following information can be known about the relative importance of each factor to this respondent: (B>A, B>C, B>D, A>D, C>D). Information about the relative importance of A and C is not known here.

[17] The questionnaire was designed such that there is information available on all combinations of options, even though no single participant sees all of them. Latent class modelling was used to predict likely preferences for combinations of options not seen by individual participants, using responses of other participants who did see those combinations. Preference scores can therefore be predicted for every participant for all combinations of attributes.

[18] Because the question wording was necessarily different when asking about satisfaction with each factor instead of the relative importance of each factor, the wording of each factor was subtly different for the regression analysis compared with the trade-off analysis. The exact wording used for each factor in each part of the questionnaire is shown in Table A.4.1 in Appendix A

4.10 The resources and facilities available to students (1.63) were also considered to be relatively more important than average, as was the professional qualification received at the end of the course (1.56).

Figure 4.1 Relative importance of teaching quality and student outcome factors among applicants



4.11 While the relative importance of each of these factors was largely similar across most types of applicants, there were a few notable subgroup differences by demographics and chosen subject.

Demographic differences

4.12 Within some key subgroups of interest (age, gender, POLAR quintile (disadvantage)) there were few differences in the relative importance of factors.

4.13 Among international applicants, exposure to employers, industry and workplaces was considered the most important factor (2.81) with graduate employment in second place (2.18). Compared with domestic applicants, international applicants also considered exposure to cutting edge ideas and research (1.36 versus 0.86) to be relatively more important, as well as exposure to enterprise, innovation and entrepreneurship (0.92 versus 0.48).

4.14 Distance learning applicants were less likely to consider inspiring and engaging teaching staff (1.74), and the opportunity to study a variety of subjects (0.98)

important, compared with non-distance learning applicants (2.01 and 1.38 respectively). Conversely, they considered graduate employment (2.69) and exposure to industry (2.54) to be relatively more important than did other applicants (2.29 and 2.09 respectively).

4.15 Some differences were also seen between applicants applying to high-tariff institutions and low-tariff institutions. Although the likelihood of securing a graduate level job was considered the most important factor by applicants to both high-tariff and low-tariff institutions, applicants to low-tariff institutions considered this to be relatively more important (2.91 versus 2.26). By contrast, applicants to high-tariff institutions were more likely to consider the opportunity to study a variety of subjects (1.38 versus 0.97) and exposure to cutting-edge ideas and research (1.07 versus 0.75) to be relatively more important than did applicants to low-tariff institutions.

4.16 Base sizes were too low to allow for statistically robust analysis by provider type or level of degree.

Subject-level differences

4.17 While the likelihood of securing a graduate level job was considered the most important factor among applicants overall, in many individual subject areas, a different factor was considered the most important.

4.18 For example, exposure to employers, industry and workplaces was considered the most important factors among those applying to courses in the fields of: Business and Management (3.35), Computing (3.27), Architecture, building and planning (3.21), and Biosciences (2.05).

4.19 Whether or not teaching staff are inspiring and engaging was considered the most important factors among applicants in the fields of: Law (2.74), Languages, linguistics and classics (2.55), Politics (2.52), English studies (2.37), Humanities and liberal arts (2.26), and Nursing (2.29).

4.20 Rigorous and stretching academic standards, while considered half as important as average among HE applicants as a whole (0.68), was considered to be of above-average importance among applicants in the fields of Politics (1.84), English studies (1.54), Chemistry (1.33) and Medicine and dentistry (1.12).

4.21 A similar story can be seen among applicants to Law courses who considered the opportunity to specialise deeply in one subject area (1.18) to be around twice as important as the average applicant did (0.66).

Which factors are considered most important among current students?

4.22 In the previous section, we discussed the relative importance of twenty teaching quality and student outcome factors to Higher Education *applicants* when deciding where to study. In this section, we present the results of a similar trade-off analysis conducted among current *students t*o determine the relative importance of the same twenty factors when evaluating the overall quality of their undergraduate experience.

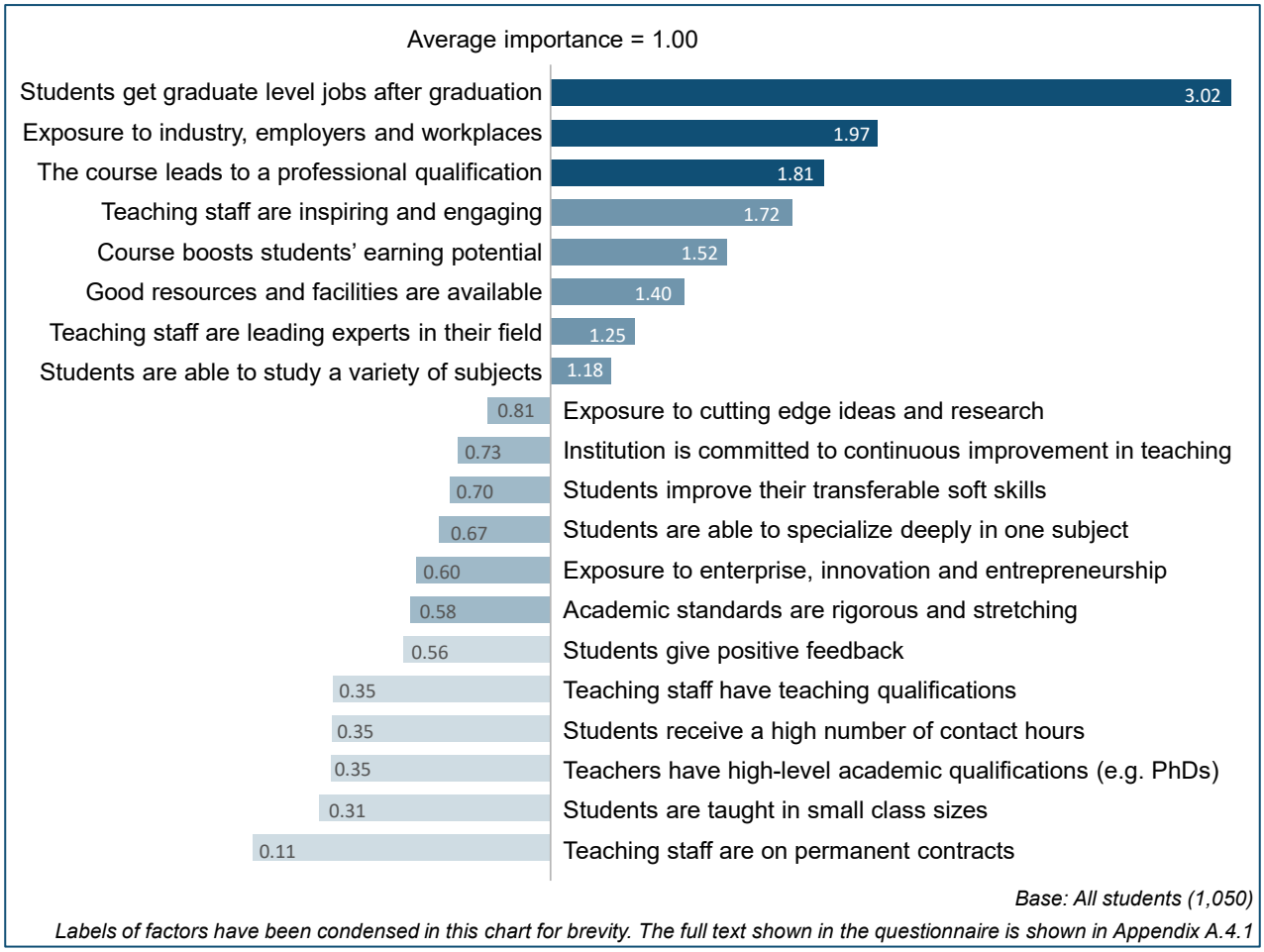
4.23 As shown in Figure 4.2, the factors considered most important by students were largely similar to those of applicants. The likelihood of securing a graduate level job was considered even more important among students than among applicants; students considered this to be three times more important than average (3.02). As with applicants, exposure to employees, industry and workplaces was also the second most important factor among students, considered to be around twice as important as the average factor (1.97). Students, like applicants, also considered the professional qualification received at the end of the course (1.81), inspiring and engaging teaching staff (1.72), and resources and facilities (1.40) to be of above-average importance.

4.24 Perhaps because future career prospects are a greater priority to current students than to Higher Education applicants, whether or not their course boosts their earning potential was considered by students to be considerably more important than the average factor (1.52), while applicants considered this factor to be of around average importance (1.09).

4.25 Applicants and students differed in their attitudes to student feedback. Applicants considered the feedback provided by students on the course to be of above-average importance (1.19) when deciding where to study. Conversely, current students considered the feedback of their peers to be about half as important as the average factor (0.56) when evaluating the overall quality of their undergraduate experience.

4.26 Contact hours, class sizes, the qualifications of teaching staff, and teaching contracts were considered by both applicants and students to be the least important factors.

Figure 4.2 Relative importance of teaching quality and student outcome factors among students



Base: All students (1,050)

Labels of factors have been condensed in this chart for brevity. The full text shown in the questionnaire is shown in Appendix A.4.1

Demographic differences

4.27 Students at high entry tariff institutions considered earning potential to be comparatively more important (1.67) than did students at low tariff (1.43) or medium tariff (1.38) institutions. Male students also considered earning potential to be relatively more important than did female students (1.71 versus 1.36), while the opposite was true for whether or not teaching staff are inspiring and engaging (Male: 1.48, Female: 1.90).

4.28 International students considered exposure to employers, industry and workplaces (2.29) and exposure to cutting-edge ideas and research (1.10) to be relatively more important than did domestic students (1.95 and 0.79 respectively).

4.29 Resources and facilities were considered to be relatively more important among students with physical or mental health conditions, illnesses or learning disabilities (1.54 versus 1.37 among those without). A similar difference in the relative importance of resources and facilities was seen among students with Special Educational Needs (1.54 versus 1.39 among those without).

4.30 There were no substantial differences by age group, home nation, or different levels of social disadvantage (as measured by either POLAR quintile or whether parents have an undergraduate degree) in terms of the relative importance of teaching

quality and student outcome factors in determining the overall quality of undergraduate experience. Base sizes were too low to allow for statistically robust analysis by provider type or level of degree.

Subject-level differences

4.31 The likelihood of securing a graduate level job was considered the most important factor among students in almost all subject areas, though some more than others. This factor was considered around four times more important than average among students in the fields of: Economics (4.67), Business and management (4.31), Subjects allied to medicine (4.19), and Communications and media (3.93).

4.32 There were only four subject areas where securing graduate level employment was not considered to be the most important factor for students when deciding where to go to university.

4.33 In the fields of Creative arts and design and Architecture, building and planning, exposure to employers, industry and workplaces was the most important factor (2.98 and 2.56 respectively). In the fields of Law, and General and others in sciences[19], the factor considered to be most important was having inspiring and engaging teaching staff (2.44 and 2.95 respectively). In all of these subjects, securing graduate level employment was ranked in second place.

Other important factors

4.34 After considering the relative importance of the twenty teaching quality and student outcome factors described above, students and applicants were asked whether there were any other factors not yet discussed which were important when deciding where to study or when evaluating the overall quality of their undergraduate experience. The vast majority of those who took part in the survey (94%) did not mention any new teaching quality or student outcome factors.

4.35 Of the new factors identified, the most commonly mentioned are presented below. Because the proportion of all applicants and students who said any additional factors at all was very low, figures refer to the absolute number of times that each factor was mentioned:

- Additional or out-of-hours academic support (46 mentions)
- A good support system more generally (39)
- Feedback from teachers and advice on progress (31)

[19] This subject area was selected by applicants who were studying science-based course but were unable to categorise this to any CAH2 subject area other than General and others in sciences.

- One-to-one time with teachers (20)
- Course content (19)
- Course structure (19)
- The ability to cater to a variety of student needs and learning styles (13)
- The opportunity to study abroad (10)

What are the key drivers of satisfaction among current students?

4.36 So far in this chapter we have discussed the factors that Higher Education applicants and students report to be most important when deciding where to study or evaluating the overall quality of their undergraduate experience. This section uses regression analysis to explore which teaching quality and student outcome factors are **key drivers** of overall student satisfaction and then examines any differences between the relative importance of these key drivers and students' reported importance of these factors presented earlier.

Overall satisfaction

4.37 A majority of first and second year students (85%) were satisfied with the overall experience of their undergraduate degree. More than a third of students (38%) were very satisfied and just 7% were dissatisfied. The overall level of satisfaction among first and second year students closely matches the overall satisfaction reported among final year students in the 2017 National Student Survey (84%)[20].

4.38 Satisfaction was higher among students at institutions with a high UCAS tariff (87%), as well as among students studying degrees within the broad subject classifications of Humanities (88%), Medical and health sciences (87%) and Natural sciences (87%). Satisfaction was lower among distance learners (76%).

Key drivers of overall satisfaction

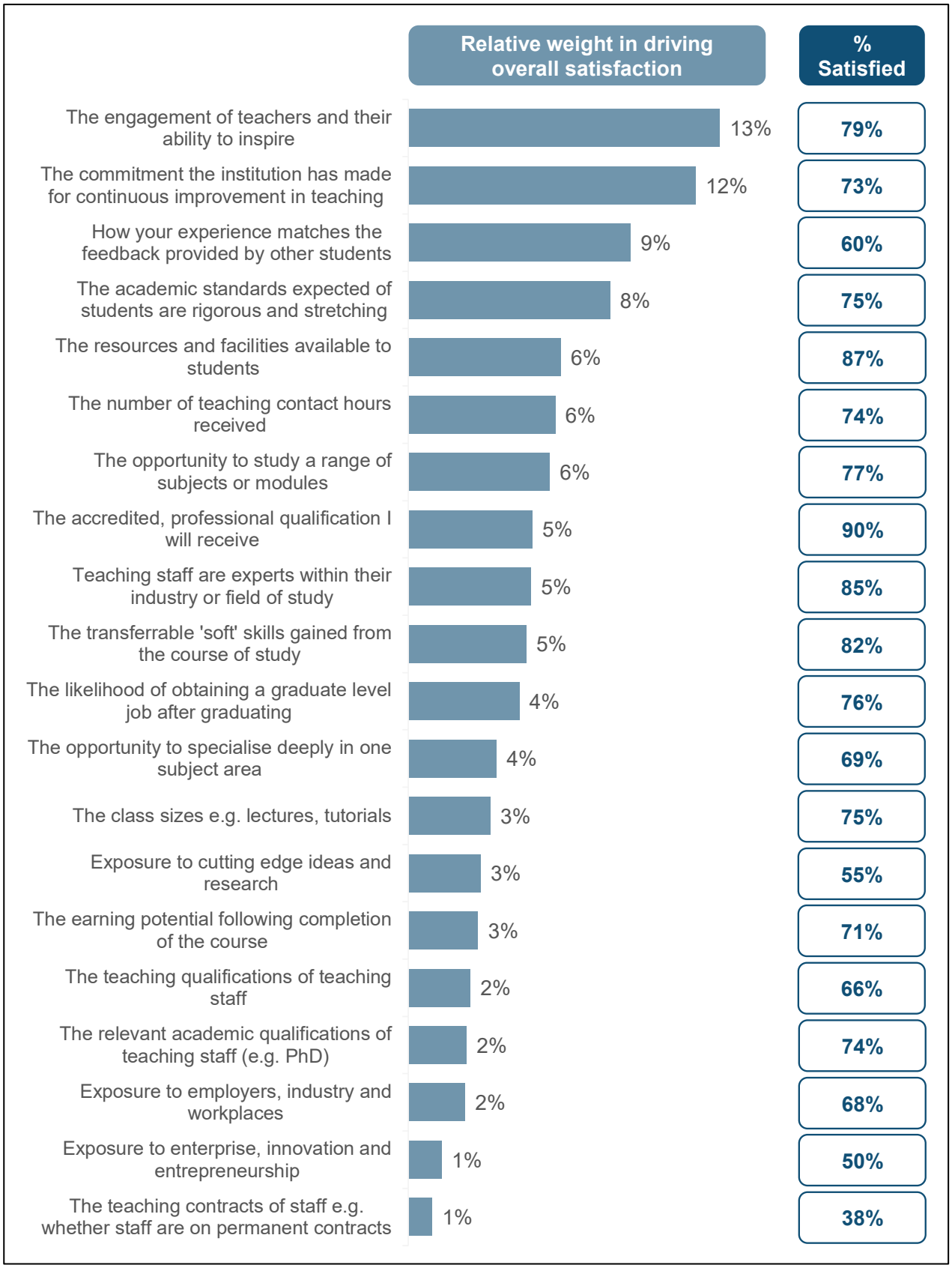
4.39 In this section of the report, we consider the extent to which students' 'overall satisfaction' scores were driven by the 20 teaching quality and student outcome factors presented in Table 4.1. Using a regression analysis, documented in Appendix B, a relative weight[21] was calculated for each of the 20 factors, depending on how much – relative to other factors – they appeared to be driving students' overall satisfaction scores. The sum of all twenty relative weights is equal to 100 per

[20] HEFCE (2017) National Student Survey
[21] As explained in Appendix B, the relative weight of a factor refers to the contribution of each factor to the R^2 of the regression model (.38)

cent. Throughout the rest of this section, discussion of ‘importance’ refers to the results of the trade-off analysis presented earlier, while the regression analysis is discussed in terms of the primary drivers of satisfaction.

4.40 Figure 4.3 shows the relative weight of each teaching quality and student outcome factor in driving overall student satisfaction, as well as the proportion of students who said that they were satisfied with each factor. Reflecting the high levels of overall student satisfaction, students were generally satisfied with most teaching quality and student outcome factors.

Figure 4.3 Relative weight of each teaching quality and student outcome factor in driving overall student satisfaction



4.41 As Figure 4.3 shows, while there was no single dominant factor driving overall student satisfaction, the two most influential drivers of overall student satisfaction related to teaching staff factors. Satisfaction with whether or not teaching staff are inspiring and engaging (relative weight: 13%) and with their institution's commitment to continuous improvement in teaching (12%) together accounted for one quarter of the total score of 100 percent. Other teaching staff factors, such as the qualifications of staff and teaching contracts had generally high levels of satisfaction, but were not as influential (i.e. they had lower relative weights).

4.42 A range of factors related to the course itself were also determined to be relatively strong drivers of overall satisfaction. These include: the feedback provided by other students, whether or not academic standards are rigorous and stretching, the resources and facilities available to students, contact hours, and the opportunity to study a range of modules.

4.43 Earlier in this chapter, it was shown that students considered the likelihood of getting a graduate level job, and exposure to employers, industry and workplaces to be the most important factors when evaluating the overall quality of their undergraduate experience. However, despite generally high levels of satisfaction with each of these factors, neither were determined by the regression analysis to be particularly strong drivers of overall student satisfaction.

4.44 Similarly, other graduate outcome factors (earning potential and the professional qualification received at the end of the course) were also considered to be of above-average importance by students when evaluating the overall quality of their undergraduate experience but did not stand out as key drivers of overall satisfaction. A summary of the rankings of the twenty measured factors from the two analyses is presented in Table 4.2.

Table 4.2 Ranking of relative importance of teaching quality and student outcome factors among students versus ranking of key drivers of student satisfaction

Rank	Relative importance ranking (trade-off analysis)	Relative importance	Key drivers of satisfaction ranking (regression analysis)	Relative Weight
1	Whether students get graduate level jobs after they graduate	3.02	The engagement of teachers and their ability to inspire	13%
2	Whether students are exposed to and involved with employers, industry and workplace	1.97	The commitment the institution has made for continuous improvement in teaching	12%
3	Whether the course leads to a professional qualification	1.81	How your experience matches the feedback provided by other students (e.g. in the National Student Survey)	9%
4	Whether teaching staff are inspiring and engaging	1.72	The academic standards expected of students are rigorous and stretching	8%
5	Whether the course boosts students' earning potential	1.52	The resources and facilities available to students	6%

Rank	Relative importance ranking (trade-off analysis)	Relative importance	Key drivers of satisfaction ranking (regression analysis)	Relative Weight
6	Whether there are good resources and facilities available to students	1.40	The number of teaching contact hours received	6%
7	Whether teaching staff are leading experts in industry or business	1.25	The opportunity to study a range of subjects or modules	6%
8	Whether students are able to study a variety of subjects	1.18	The accredited, professional qualification I will receive	5%
9	Whether students are exposed to and involved in cutting edge ideas and research	0.81	Teaching staff are experts within their industry or field of study	5%
10	Whether the institution is committed to continuous improvement in teaching	0.73	The transferrable 'soft' skills gained from the course of study e.g. teamwork, communication, leadership	5%
11	Whether students improve their transferable soft skills	0.70	The likelihood of obtaining a graduate level job after graduating	4%
12	Whether students are able to specialise deeply in one subject	0.67	The opportunity to specialise deeply in one subject area	4%
13	Whether students are exposed to and involved in enterprise, innovation and entrepreneurship	0.60	The class sizes e.g. lectures, tutorials	3%
14	Whether academic standards are rigorous and stretching	0.58	Exposure to and/or the opportunity to become involved in cutting edge ideas and research	3%
15	Whether students give positive feedback (about the teaching and experience of studying at that provider)	0.56	The earning potential following completion of the course	3%
16	Whether teaching staff have high level academic qualifications such as PhDs	0.35	The teaching qualifications of teaching staff (e.g. professional training or development)	2%
17	Whether students receive a high number of contact hours	0.35	The relevant academic qualifications of teaching staff (e.g. PhD)	2%
18	Whether teaching staff have teaching qualifications	0.35	Exposure to and/or the opportunity to be involved with employers, industry and workplaces (e.g. placements and internships)	2%
19	Whether students are taught in small class sizes	0.31	Exposure to and/or the opportunity to becoming involved in enterprise, innovation and entrepreneurship	1%
20	Whether teaching staff are on permanent contracts	0.11	The teaching contracts of staff e.g. whether staff are on permanent contracts	1%

4.45 It is notable that the factors that students consider to be important differ substantially from the factors which stand out as drivers of satisfaction. One explanation for this difference could be that students take a long-term perspective when evaluating what is important to them, focusing on factors such as whether the course leads to graduate-level employment or increased future earnings, but that more immediate factors – such as inspiring teaching or rigorous and stretching course design – have more impact in driving their current levels of satisfaction. It is also worth noting that there were a number of factors which were both reported to be relatively unimportant and did not appear to drive satisfaction, including class size and whether staff had teaching qualifications or were on permanent contracts.

5 Awareness of the TEF

Introduction

5.1 The TEF is a new initiative for measuring teaching quality and student outcomes among HE providers that the DfE introduced in 2016, with the first results published in 2017. Both part one and part two surveys captured applicants' broad awareness of the TEF, whether they were familiar with the award their preferred HE provider received, and how useful subject-level TEF would be. In addition, part one applicants were asked whether subject-level TEF awards alongside provider-level TEF awards would have been more or less helpful when deciding where to study.

5.2 It was expected that awareness and use of TEF would be low amongst applicants and students as the TEF was still in its early stages of implementation at the time of the research. It is also expected that applicant and student engagement will gradually increase as TEF becomes more embedded.

5.3 It is likely that the level of TEF awareness and knowledge reported for the research sample would be higher than for the full applicant sample at this point in TEF development. This is primarily due to the nature of the sample and weighting applied (as explained in the Methodology chapter), but may also be due to including reference to TEF during the survey recruitment process, where applicants with a higher level of self-reported TEF knowledge may opt-in to the research and those with a lower level may opt-out.

5.4 As would be expected, results across the two surveys were fairly consistent, although we have theorised as to why there might be differences where these exist. One should also take care in the wider use of these figures; the nature and content of questioning prior to the TEF awareness questions might prime some respondents to answer differently than had they been exposed to a more traditional evaluation assessing awareness levels.

Awareness of provider-level TEF

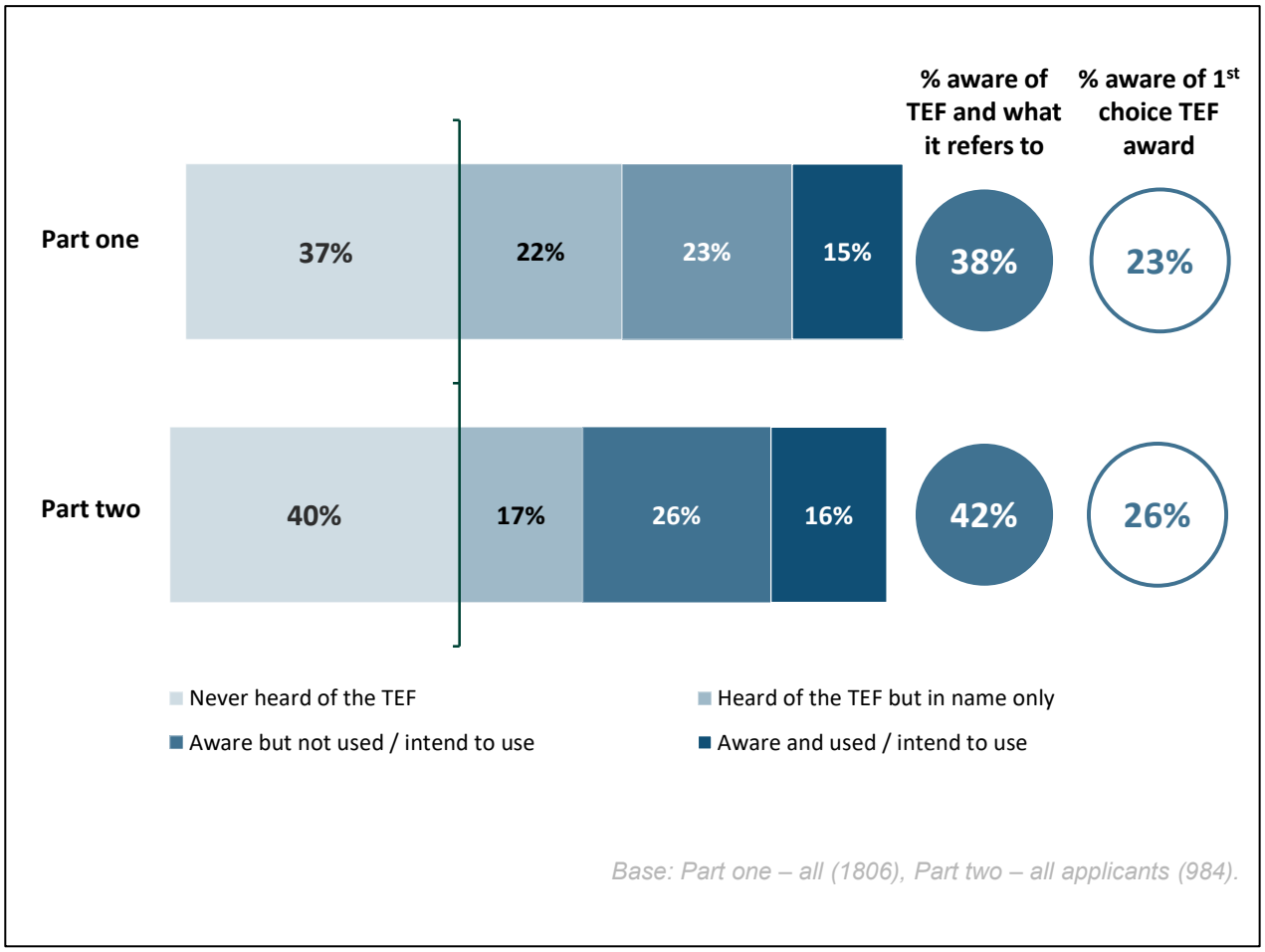
5.5 Despite the relatively recent introduction of the TEF, the majority of applicants in this research had heard of the TEF (part one 60%, part two 59%). This was higher than reported in other research[22]. As Figure 5.1 shows, around four in ten (part one 38%, part two 42%) applicants were aware of what the TEF refers to and a further one in five had heard of it, albeit in name only (part one 22%, part two 17%).

[22] Enrolment Solutions (2018) UK domestic student survey reported an awareness level of 46%, although this was also not a sample fully representative of the applicant population

Across all applicants, around one in eight (part one 15%, part two 16%) reported that they had used the TEF to inform their choice of institution, or intended to do so.

5.6 For the purposes of further analysis, "applicants aware of TEF" are taken as those who indicated that they were aware of the TEF framework and what it refers to. Those that have heard of the TEF in name only are identified as a separate group, as are those who have not heard of the TEF at all.

Figure 5.1 Awareness of the TEF



5.7 Awareness of TEF was much lower amongst those yet to submit their application (21% on part one compared with 40% of those who had submitted). Indeed, nearly half (46%) of those yet to submit had not heard of the TEF.

5.8 Differences in awareness can also be observed by subject area. Applicants to courses that have been classified as complex courses at a CAH2 level (45%) were more likely to be aware of the TEF than those applying to simple courses (37%).

5.9 Individuals applying to courses classified within the broad subject area of Natural sciences were more likely to be aware of the TEF (part one 51%, part two 54%). By CAH2, those part one applicants applying to a course in Physics and astronomy (71%), Education and teaching (56%), Biosciences (50%) and Politics (50%) in particular were more likely to be aware of the TEF. In part two, those applying to a course in Physics and astronomy (70%), Computing (65%) and Biosciences (54%) were more likely to be aware of the TEF.

5.10 Those applying to high tariff institutions also had higher levels of awareness in part one (43% vs. 38%), although this difference did not materialise in part two.

5.11 Location also plays a part in awareness of the TEF, with higher levels of awareness among English domiciled applicants than elsewhere (part one 42%, part two 48%). Awareness was lowest among Northern Ireland and Scottish domiciled applicants, although the base sizes are relatively low across both surveys at this level. Those based outside the UK were also much less likely to be aware of the TEF. A similar pattern occurred by HE Provider location. The base of respondents is too low to conduct analysis on the type of HE provider an applicant was applying to and its link to levels of awareness of the TEF.

5.12 Certain demographic factors were also linked to levels of awareness of the TEF:

- Applicants under the age of 19 were generally more likely to be aware of the TEF (part one 42%, part two 47%) than those aged 19+ (part one 30%, part two 32%). White applicants were also more likely to be aware of the TEF (part one 40%, part two 44%) compared with BME applicants (part one 34%, part two 38%). And while there was no difference in the part two survey, in part one, male applicants were more aware of the TEF compared with female applicants (43% vs. 35%).
- On part one of the survey applicants from POLAR quintile 1 (lowest participation areas) were more likely (59%) to be aware of the TEF compared with those from other quintiles (from 41% to 49%). This difference was not replicated in part two of the survey however, and there was no difference of note by whether applicants' parents had a degree.
- Applicants to Level 6 degrees were more likely to be aware of the TEF (part one 39%, part two 43%) than those applying lower level degrees (part one 25%, part two 30%).

5.13 Awareness of the specific TEF award received by an applicant's first choice institution was relatively low, with around one in four of all reporting that they were aware of the TEF award given to their first-choice institution (part one 23%, part two 26%).

5.14 The profile of those most likely to be aware of the TEF award of their first-choice institution was overall similar to the profile of applicants that were aware of the TEF as a whole, with the following standing out:

- Applicants to Natural sciences courses (part one 36%, part two 33%);
- Applicants to high tariff institutions (part one 28%, part two 28%);
- Applicants domiciled in England (part one 27%, part two 31%);
- Applicants to higher education providers in England (part one 27%, part two 30%);
- Applicants aged under 19 (part one 27%, part two 30%); and

- White applicants (part one 25%, part two 28%).

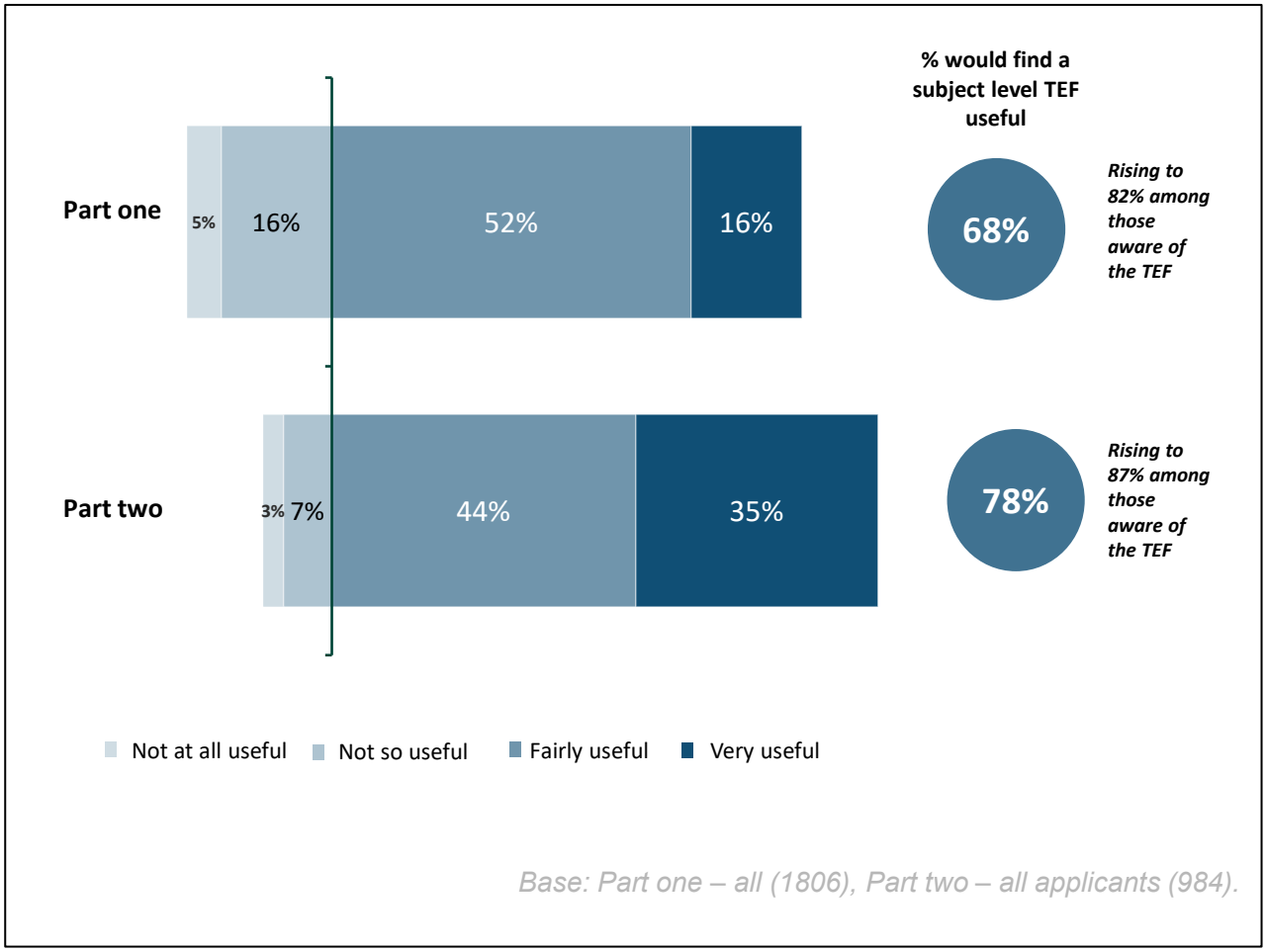
Perceptions of the usefulness of subject-level TEF

5.15 While awards are currently given at provider level, from academic year 2019/20 they will also be awarded at subject level.

5.16 Applicants and pre-applicants appear to value the usefulness of subject-level TEF awards. Around three in four applicants (part one 68%, part two 78%) reported that they would find subject-level TEF useful. Only a small minority of applicants and pre-applicants (part one 5%, part two 3%) said that they would find subject-level TEF to be of no use at all.

5.17 Figure 5.2 shows the distribution of responses for both parts of the survey.

Figure 5.2 Usefulness of subject-level TEF



5.18 On both parts of the survey, applicants that were aware of the TEF and its purpose were more likely to consider subject-level TEF to be useful (part one 82%, part two 87% - compared to 68% and 78% on average). This rose further amongst applicants aware of the TEF award of their preferred institution (part one 88%, part two 90%), therefore demonstrating a strong association between familiarity with the provider-level TEF and appreciation of the usefulness of subject-level TEF.

5.19 One key difference in attitudes towards subject-level TEF is found in the results between the two parts of the survey. Around eight in 10 (78%) part two applicants considered that subject-level TEF would be useful, compared with around seven in 10 (68%) of part one applicants. While there are some minor differences in the profile of applicants responding to each survey, we hypothesise that the key reason behind this difference is likely to be a result of the different routes through the survey. Prior to answering about the usefulness of subject-level TEF, part one applicants are shown some potential difficulties involved in classifying subjects, as they are asked to try to classify their course into various subject area classifications, while in part two applicants are shown factors that relate to aspects of teaching quality and student outcomes that are or could be captured by TEF. Consequently, respondents undertaking part two are potentially more likely to consider the benefits of subject-level TEF, while part one applicants have been primed to consider some of the difficulties of subject-level TEF.[23]

5.20 There was not a great variance in attitudes across the tariff of an applicant's preferred provider of higher education, although on part two those applying to high tariff institutions were slightly more likely to find subject-level TEF useful (81%). There were no differences in views about the utility of subject-level TEF between applicants to Level 6 degrees and applicants to lower level degrees.

5.21 There was little variation by other subgroups of interest, although on part one Black (80%) applicants and those of Mixed ethnicity (79%) were more positive than average (68%), as were those in the most disadvantaged POLAR quintile (POLAR 1: 81%). But these differences were not reflected in part two.

5.22 It is also worthwhile exploring views by the type of subject individuals were applying to. Excluding CAH2 subjects with a low number of applicants, individuals applying to Law (part one 82%; part two 87%), Politics (part one 80%; part two 90%) and Psychology (part one 74%; part two 86%) were typically most positive towards subject-level TEF. By way of contrast, it was regarded as being less useful among Communications and Media (part one 50%; part two 73%) and English studies (55% part one, 71% part two) applicants.

5.23 Table 5.1 shows the proportion citing subject-level TEF as useful by CAH2.

[23] On part one, applicants who considered selecting an appropriate subject area for their course from the three classifications as 'easy' were much more likely to report that subject-level TEF would be useful.

Table 5.1 Usefulness of subject-level TEF by subject area

		Base		% Useful	
		Part 1	Part 2	Part 1	Part 2
Total	%	**1,806**	**984**	**68%**	**78%**
CAH2					
Agriculture, food and related studies	%	16	5	*51%*	*60%*
Architecture, building and planning	%	30	17	72%	*82%*
Biosciences	%	89	83	72%	77%
Business and management	%	158	55	63%	75%
Celtic studies	%	0	0	-	-
Chemistry	%	43	19	67%	*89%*
Combined and general studies	%	7	0	*84%*	-
Communications and media	%	34	11	50%	*73%*
Computing	%	84	31	68%	81%
Creative arts and design	%	83	54	68%	70%
Economics	%	51	43	57%	84%
Education and teaching	%	57	25	72%	*76%*
Engineering	%	83	58	71%	74%
English studies	%	54	31	55%	71%
General and others in sciences	%	0	8	-	*100%*
Geographical and environmental studies	%	48	16	61%	*88%*
Health and social care	%	14	23	*70%*	*83%*
History and archaeology	%	79	26	69%	*81%*
Humanities and liberal arts (non-specific)	%	2	26	*100%*	*81%*
Languages, linguistics and classics	%	67	25	78%	*68%*
Law	%	74	39	82%	87%
Mathematical sciences	%	66	35	60%	77%
Medicine and dentistry	%	88	74	61%	77%
Nursing	%	61	65	71%	74%
Pharmacology, toxicology and pharmacy	%	21	4	*96%*	*100%*
Philosophy and religious studies	%	26	8	*56%*	*100%*
Physical, material and forensic sciences	%	19	4	*79%*	*75%*
Physics and astronomy	%	49	27	78%	*85%*
Politics	%	66	29	80%	*90%*
Psychology	%	101	56	74%	86%
Sociology, social policy and anthropology	%	56	26	74%	77%
Sport and exercise sciences	%	23	17	*66%*	82%
Subjects allied to medicine not otherwise specified	%	116	7	64%	*86%*
Technology	%	4	6	*74%*	*67%*
Veterinary sciences	%	37	12	68%	*75%*
Unknown	%	0	19	-	*58%*

5.24 Part one applicants who were aware of provider-level TEF were also asked whether they would have found subject-level TEF helpful when applying. The majority (79%) said they would, with one in nine (18%) suggesting it would make no difference, and only one per cent stating it would be less useful.

5.25 Applicants applying to courses that have been classified as complex were even more likely to find the introduction of subject-level TEF to be helpful (89% across each classification).

6 Conclusions

6.1 Following extensive testing with individuals applying to an HE undergraduate course in the 2018/19 academic year, part one of this study provides evidence that of the three classifications tested, CAH2 appears to be the better of the three classification systems tested to use for subject-level TEF.

6.2 Across the three key measures used to determine suitability - accuracy, sufficiency and ease of use[24] - CAH2 performed considerably better than the Broad classification. Differences were smaller when comparing CAH2 with CAH1 at the overall level; only in terms of sufficiency did CAH2 perform *significantly* better. However, at a subject-level, moving from CAH1 to CAH2 improved accuracy for certain subjects that could be classified at a more granular level. This additional granularity also enabled applicants to spot their relevant subject area more quickly using CAH2 compared to CAH1, indicating CAH2 was easier to use.

6.3 The study also highlights that if wording changes were made to some of the subject categories, this could lead to further improvements in accuracy (and a likely resultant positive impact on other measures). We would recommend including Midwifery in the Nursing category and potentially adding Performing arts to Creative arts and design. We would also suggest reviewing the courses that fall within Communications and media and potentially including one or two of the most common within the wording of the subject area name to make this more tangible. Consideration should also be given to adding Criminology to the Sociology, social policy and anthropology CAH2 category name although potentially this makes the category unwieldy considering that, even in its current form, there is feedback that it is already too broad a subject grouping.

6.4 “Subjects allied to medicine not elsewhere specified” needs far more clarity and we would recommend a more comprehensive review with only one in seven accurately classifying their course to this category. For this subject area, which was designed to incorporate courses such as Therapy, Nutrition, Optometry and Biomedical science, applicants considered the terminology was too vague and struggled to think of specific courses that should be included within the subject area, especially as Medicine, Dentistry, Biosciences and Nursing were covered by other CAH2 classifications. A common theme among applicants whose courses are technically classified within this category was that their course had little affiliation to medicine. This was particularly pronounced among food and nutrition applicants, and those applying to therapy or physiotherapy courses.

[24] ‘Accuracy’ - whether applicants selected the correct subject area relating to their preferred course; ‘Sufficiency’ - whether a TEF award given to the subject area they chose would sufficient to be able determine the quality of their preferred course; ‘Ease of use’ - how easy or difficult they found the process of selecting a subject area

6.5 It is likely that the Broad subject classification would not be helpful to potential applicants to assist in their decision making, based on its poor performance on sufficiency, as well as issues with accuracy among those applying for courses that should be classified as Humanities, Natural Sciences or Social Sciences.

6.6 The study also provides indications of the number of subject area TEF awards applicants might look at, in order to get an indication of the quality of their preferred course. The majority of those applying to complex' courses (i.e. courses that are classified to more than one subject area) considered that they would look at more than one subject area, although only around a fifth considered this to be 'very' likely (Broad 19%, CAH1 20%, CAH2 23%). This suggests that a sizeable minority of applicants might overlook information about the quality of their preferred course, by inspecting the TEF award within one subject area only; a particular concern for those applying to joint honours degrees.

6.7 Part two of the study highlights a number of teaching quality and student outcome factors that should be considered when further developing subject-level TEF. From a MaxDiff trade-off, the two most important factors for both applicants, when deciding where to study, and for students, in influencing the overall quality of their undergraduate experience, were the likelihood of securing a graduate job and potential exposure to employers, industry and workplaces, although there was a little deviation in order importance by subject.

6.8 Regression analysis showed that a variety of factors contribute to overall student satisfaction although, despite generally high satisfaction levels, graduate outcomes and wider opportunity factors such as exposure to employers, industry and workplaces did not stand out as key drivers of overall satisfaction. Instead, the most important relate to teaching staff quality, namely institutions' commitment to continuous improvement in teaching, and whether or not teaching staff are inspiring and engaging. A range of factors related to the course itself were also determined to be important drivers of overall satisfaction.

6.9 The differences in the two results highlights that it is important to consider teaching excellence and student outcome factors that are currently being experienced by students and can have an immediate impact on student satisfaction, as well as factors that have a longer term impact linked to graduate outcomes.

6.10 There are a handful of factors that appeared low on the list of both set of analyses and, from a student perspective at least, could potentially be deprioritised from subject-level TEF development. This includes teaching staff contracts, class sizes and the academic qualifications of teachers.

6.11 The research also provided an opportunity to measure and benchmark levels of awareness of provider-level TEF among the first group of applicants to have had potential exposure to TEF awards.

6.12 The study shows that around two fifths of 2018/19 applicants who participated in this research were aware of what TEF refers to and a further one in five aware of

TEF in name only. Across all applicants, around one in eight had used the TEF to inform their choice of institution, or intended to do so, while around a quarter were aware of the TEF award given to their first-choice institution. Given TEF is still in its early stages of implementation, we would expect current awareness to be low, but for this to gradually increase over time as TEF becomes more embedded. The awareness levels in this research therefore represent a baseline for future TEF research against which future communication, awareness and student engagement can be measured.

6.13 The overall picture of attitudes towards the introduction of subject-level TEF demonstrates widespread and consistent appreciation for the value of subject-level TEF ratings. Around three quarters of all applicants reported that they would find subject-level TEF awards useful, alongside provider-level awards (part one 68%, part two 78%). Only a small minority of applicants (part one 5%, part two 3%) would find subject-level TEF to be of no use at all.

6.14 Despite the relative newness, and thus novelty, of the TEF at the point the research was undertaken and the resultant mixed level of awareness of the TEF and the awards held by institutions, there is a clear association between awareness of the provider-level TEF and appreciation of the utility of subject-level TEF. Applicants that were aware of the TEF and its purpose were much more likely to consider subject-level TEF to be useful (part one 82%, part two 87%). This rose further amongst applicants aware of the TEF award of their preferred institution (part one 88%, part two 90%).

6.15 This study has provided a wealth of insight that should support future development of the TEF, particularly as it transitions to subject-level awards. In particular it has identified from the value applicants are likely to derive from subject-level information, that CAH2 should, from a student perspective, serve as the optimal classification at which awards are made, while it has also established the most and least important teaching quality and student outcome factors for applicants and students.

Appendix A: Detailed data tables

Table A.1.1 Unweighted sample profile by key demographics

	Part 1	Part 2	
	Applicants	**Applicants**	**Students**
Total	**1,806**	**984**	**1,051**
Gender			
Male	667	310	465
Female	1,104	658	573
In some other way	18	7	7
Prefer not to say	17	9	6
Age			
18 or under	1,595	647	304
19 to 21	134	227	601
21+	71	106	142
Prefer not to say	6	4	4
Ethnicity			
White	1,306	691	817
Mixed	84	53	40
Asian	268	157	151
Black	83	64	26
Other	34	7	4
Prefer not to say	31	12	13
Domicile			
UK	1,491	762	977
EU	179	117	40
Non-EU	114	96	26
Prefer not to say	22	9	8

Table A.1.2 Unweighted sample profile by institutional information

	Part 1	Part 2	
	Applicants	**Applicants**	**Students**
Total	**1,806**	**984**	**1,051**
HEP Location			
England	1,410	772	797
Northern Ireland	40	14	40
Scotland	155	93	135
Wales	60	31	72
Unknown	141	74	7
HEP Type			
University	1,639	885	1,016
Further Education College	14	17	16
Alternative Provider of HE	12	8	10
Unknown	141	74	9
Average Tariff			
High	1,133	579	506
Medium	309	179	320
Low	192	122	185
Unknown	172	104	68
Type of Degree			
Undergraduate Degree	1,751	947	993
Foundation Degree	32	16	33
HE Credits	0	0	1
Higher National Diploma / Certificate	10	6	11
Other undergraduate	3	5	5
Unknown	10	10	8

Table A.1.3 Unweighted sample profile by correct CAH2

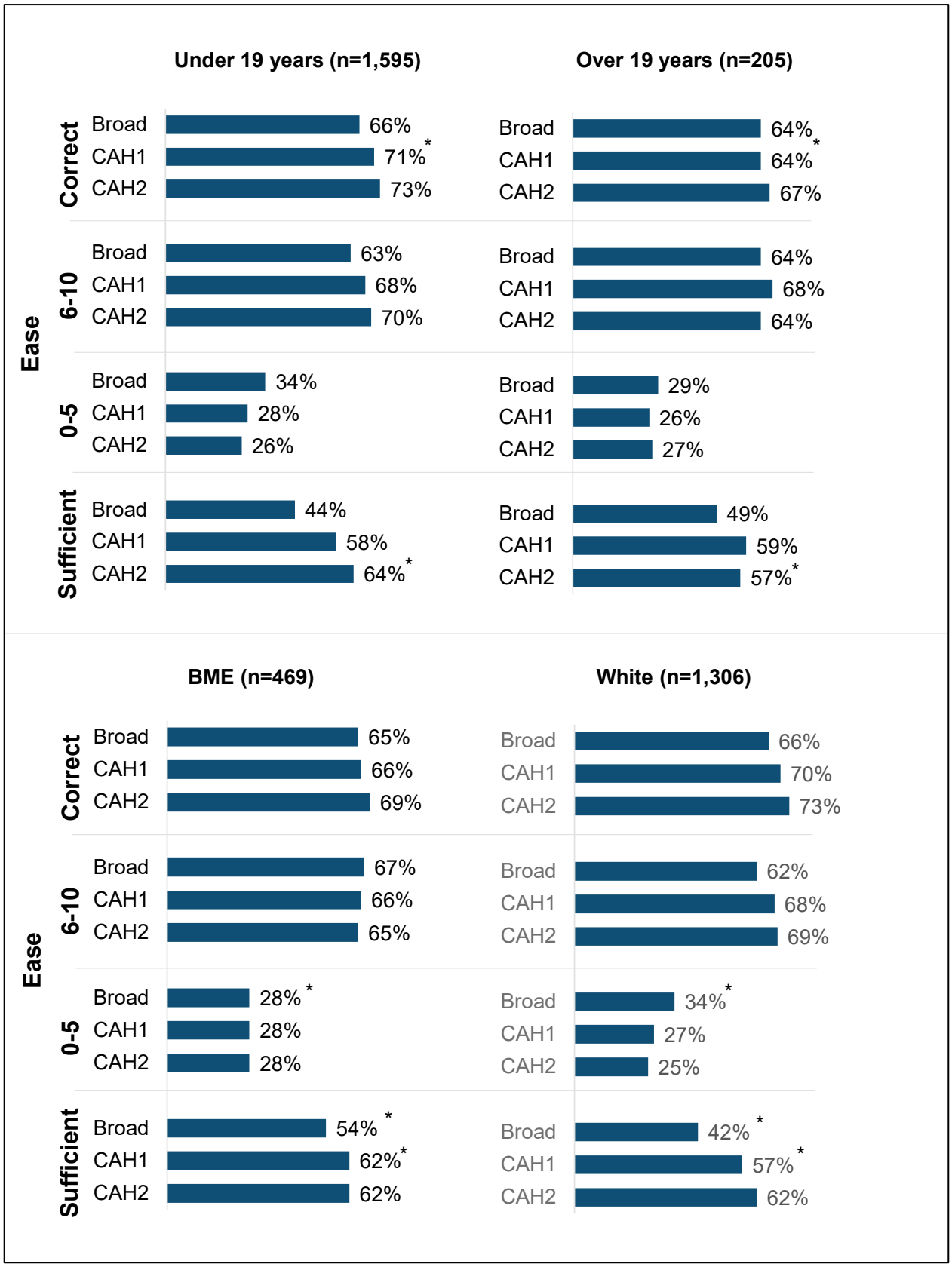
	Part 1	Part 2	
	Applicants	Applicants	Students
Total	**1,806**	**984**	**1,051**
CAH2			
Agriculture, food and related studies	16	5	5
Architecture, building and planning	30	17	18
Biosciences	89	83	87
Business and management	158	55	96
Celtic studies	0	0	2
Chemistry	43	19	22
Combined and general studies	7	0	5
Communications and media	34	11	20
Computing	84	31	60
Creative arts and design	83	54	71
Economics	51	43	28
Education and teaching	57	25	33
Engineering	83	58	95
English studies	54	31	23
General and others in sciences	0	8	14
Geographical and environmental studies	48	16	29
Health and social care	14	23	21
History and archaeology	79	26	36
Humanities and liberal arts (non-specific)	2	26	13
Languages, linguistics and classics	67	25	20
Law	74	39	44
Mathematical sciences	66	35	31
Medicine and dentistry	88	74	49
Nursing	61	65	27
Pharmacology, toxicology and pharmacy	21	4	9
Philosophy and religious studies	26	8	10
Physical, material and forensic sciences	19	4	6
Physics and astronomy	49	27	17
Politics	66	29	19
Psychology	101	56	56
Sociology, social policy and anthropology	56	26	24
Sport and exercise sciences	23	17	13
Subjects allied to medicine not otherwise specified	116	7	12
Technology	4	6	6
Veterinary sciences	37	12	24
Unknown	0	19	6

Table A.3.1 Classification of each CAH2 subject area to CAH2 subject area

Blue cells refer to the % of applicants who selected the correct CAH2 subject area. Red cells refer to an incorrect CAH2 subject area selected by ≥10% of applicants, where the sample size is ≥30. ***Showing row percentages***	***Base***	**Agriculture, food and related studies**	**Architecture, building and planning**	**Biosciences**	**Business & management**	**Celtic studies**	**Chemistry**	**Combined and general studies**	**Communications & media**	**Computing**	**Creative arts and design**	**Economics**	**Education and teaching**	**Engineering**	**English studies**	**General and others in sciences**	**Geographical and environmental studies**	**Health and social care**	**History and archaeology**	**Humanities and liberal arts (non-specific)**	**Languages, linguistics and classics**	**Law**	**Mathematical sciences**	**Medicine and dentistry**	**Nursing**	**Pharmacology, toxicology and pharmacy**	**Philosophy and religious studies**	**Physical, material and forensic sciences**	**Physics and astronomy**	**Politics**	**Psychology**	**Sociology, social policy and anthropology**	**Sport & exercise sciences**	**Subjects allied to medicine not otherwise specified**	**Technology**	**Veterinary sciences**	**Unknown**
Agriculture, food and related studies	*16*	**15**		28	8		22									4																			15	8
Architecture, building and planning	*29*		**87**											11																						3
Biosciences	*82*		1	**67**		3	1			1						3	1							5							1			1		3	14
Business and management	*122*		2		**80**				1	2		3			2								2							1	1					8
Celtic studies	*0*																																			
Chemistry	*42*						**85**																4													11
Combined and general studies	*7*														16	9										16		10	16		32					
Communications and media	*34*				2			8	**59**	5	10				4					2		2												4		6
Computing	*80*				1			4	1	**86**	1	1		2																				1		4
Creative arts and design	*75*		4						3		**63**			1						4	1										1			3		19
Economics	*47*				7					2		**86**								2									2							2
Education and teaching	*51*				3								**80**		2			2							2					3		1			9
Engineering	*82*		3	2			1		1	4	1	1		**76**														3					3		6
English studies	*48*								2				4		**87**					2	2															4
General and other sciences	*0*																																			
Geographical and environmental studies	*46*		5									2					**88**			2									2							2
Health and social care	*14*												8					**42**												5	38		3			3

Blue cells refer to the % of applicants who selected the correct CAH2 subject area. Red cells refer to an incorrect CAH2 subject area selected by ≥10% of applicants, where the sample size is ≥30. ***Showing row percentages***	***Base***	**Agriculture, food and related studies**	**Architecture, building and planning**	**Biosciences**	**Business & management**	**Celtic studies**	**Chemistry**	**Combined and general studies**	**Communications & media**	**Computing**	**Creative arts and design**	**Economics**	**Education and teaching**	**Engineering**	**English studies**	**General and others in sciences**	**Geographical and environmental studies**	**Health and social care**	**History and archaeology**	**Humanities and liberal arts (non-specific)**	**Languages, linguistics and classics**	**Law**	**Mathematical sciences**	**Medicine and dentistry**	**Nursing**	**Pharmacology, toxicology and pharmacy**	**Philosophy and religious studies**	**Physical, material and forensic sciences**	**Physics and astronomy**	**Politics**	**Psychology**	**Sociology, social policy and anthropology**	**Sport & exercise sciences**	**Subjects allied to medicine not otherwise specified**	**Technology**	**Veterinary sciences**	**Unknown**
History and archaeology	*64*		1																**86**	4	1									3						4
Humanities and liberal arts (non-specific)	*2*														5					**50**																
Languages, linguistics and classics	*57*								2		1				2				6	8	**70**									3						7
Law	*70*											1							4		1	**79**								5	2					8
Mathematical sciences	*61*									3			12			1							**77**												7	
Medicine and dentistry	*88*	1		2			1										1	1						**84**										1		8
Nursing	*61*						3											23							**62**									5		8
Pharmacology, toxicology and pharmacy	*21*			4																						**85**										11
Philosophy and religious studies	*23*												17		3					3							**76**									
Physical, material and forensic sciences	*19*						11					5				11	37						5					**16**			5				5	5
Physics and astronomy	*49*		2				2			2													3					5	**83**							5
Politics	*42*							2									8			10		2								**75**		2				3
Psychology	*97*			1	1				3									8													**83**					4
Sociology, social policy and anthropology	*34*				6								5							14		2					3			3	3	**55**				10
Sport and exercise sciences	*23*			2									6																			**88**				3
Subjects allied to medicine not otherwise specified	*78*			19						1								30						6	1						1		16	**14**		1	11
Technology	*4*													74		26																		**91**	9
Veterinary sciences	*37*																																			

Figure A.3.1 Key measures by age and ethnicity



* Denotes statistically significant differences between subgroups.

Figure A3.2 Key measures by POLAR quintile and whether parents have a degree

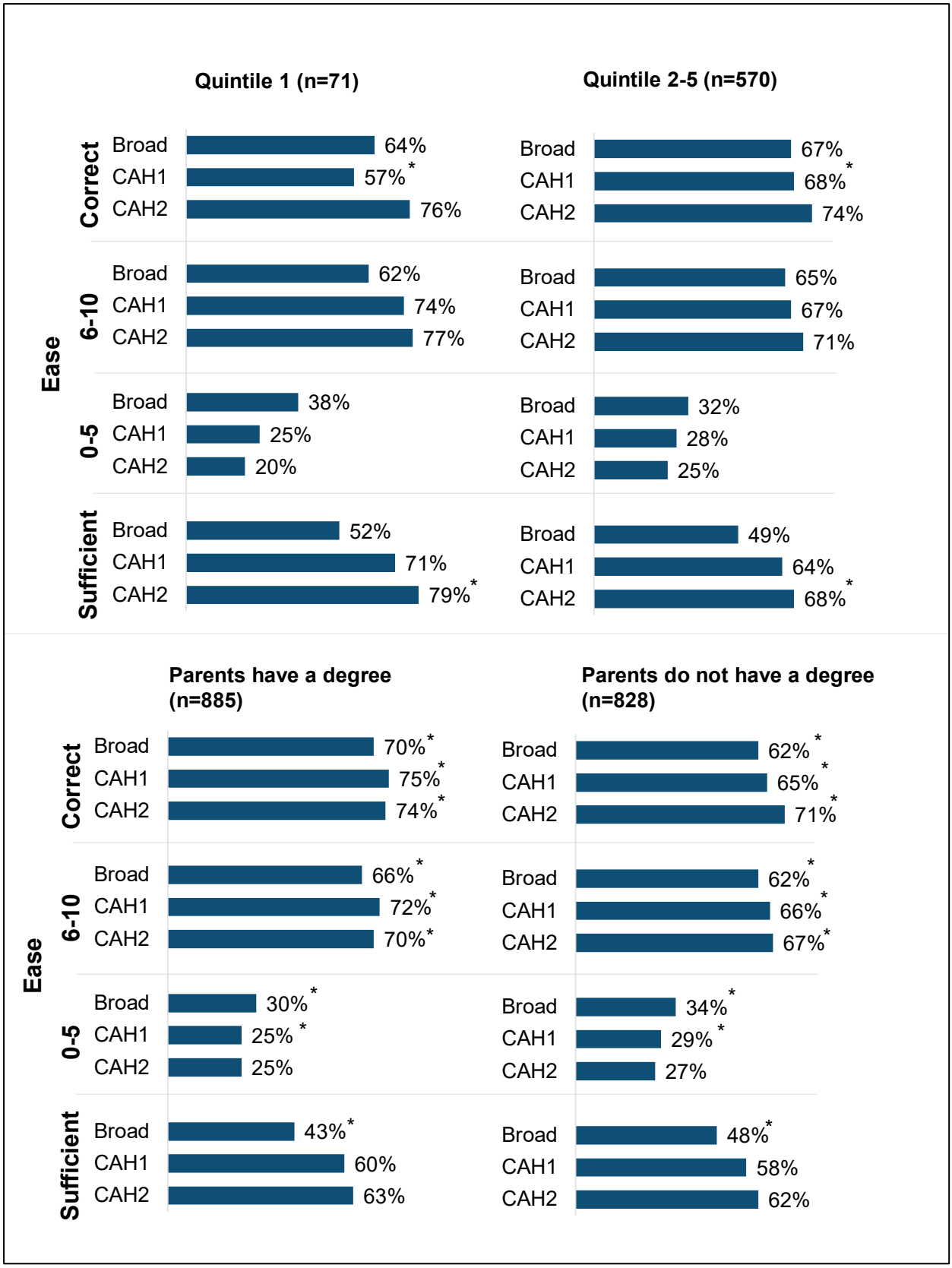


Figure A.3.3 Key measures by disability and SEN status

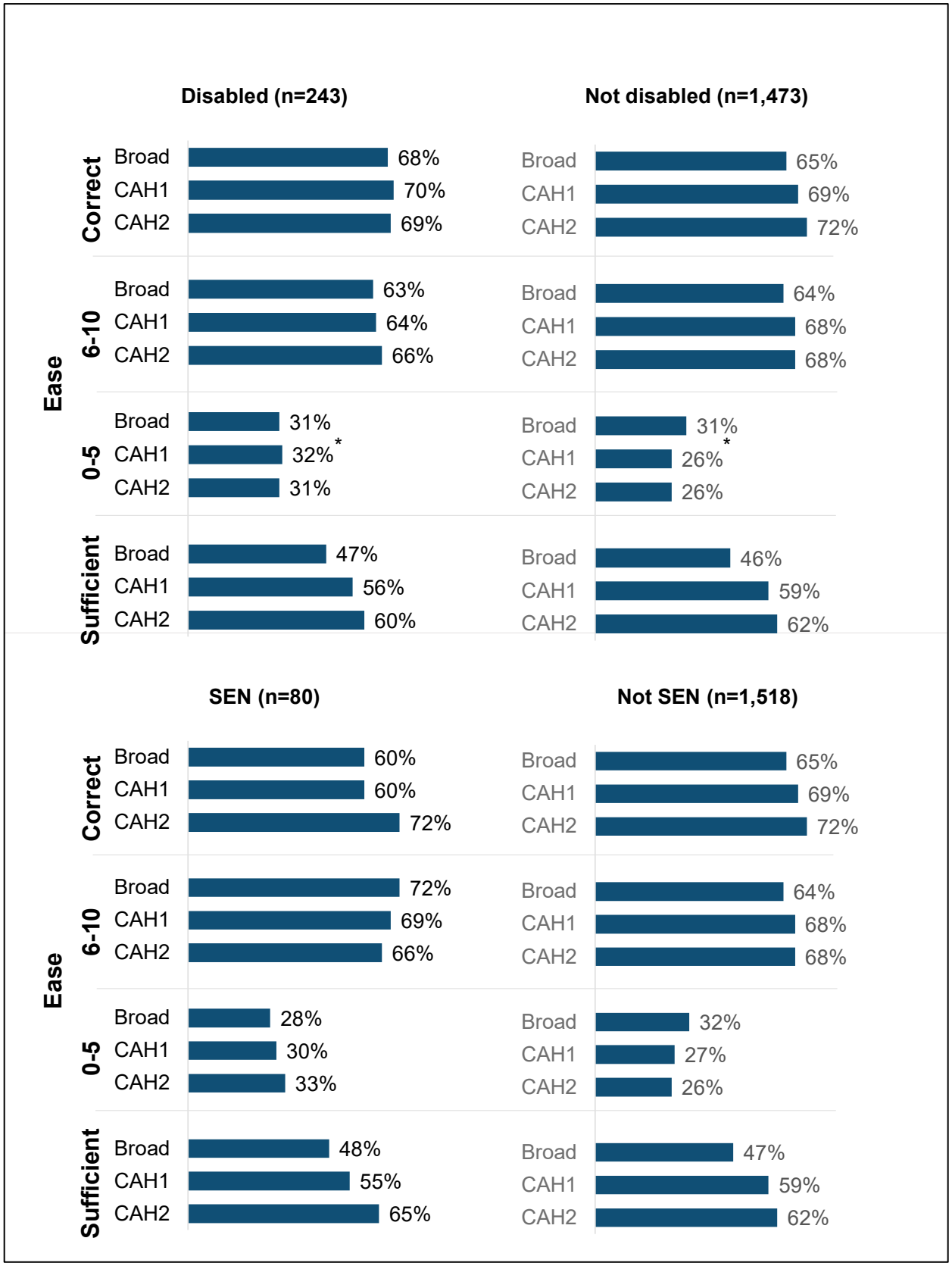


Figure A.3.4 Key measures by application submission status and HEP tariff

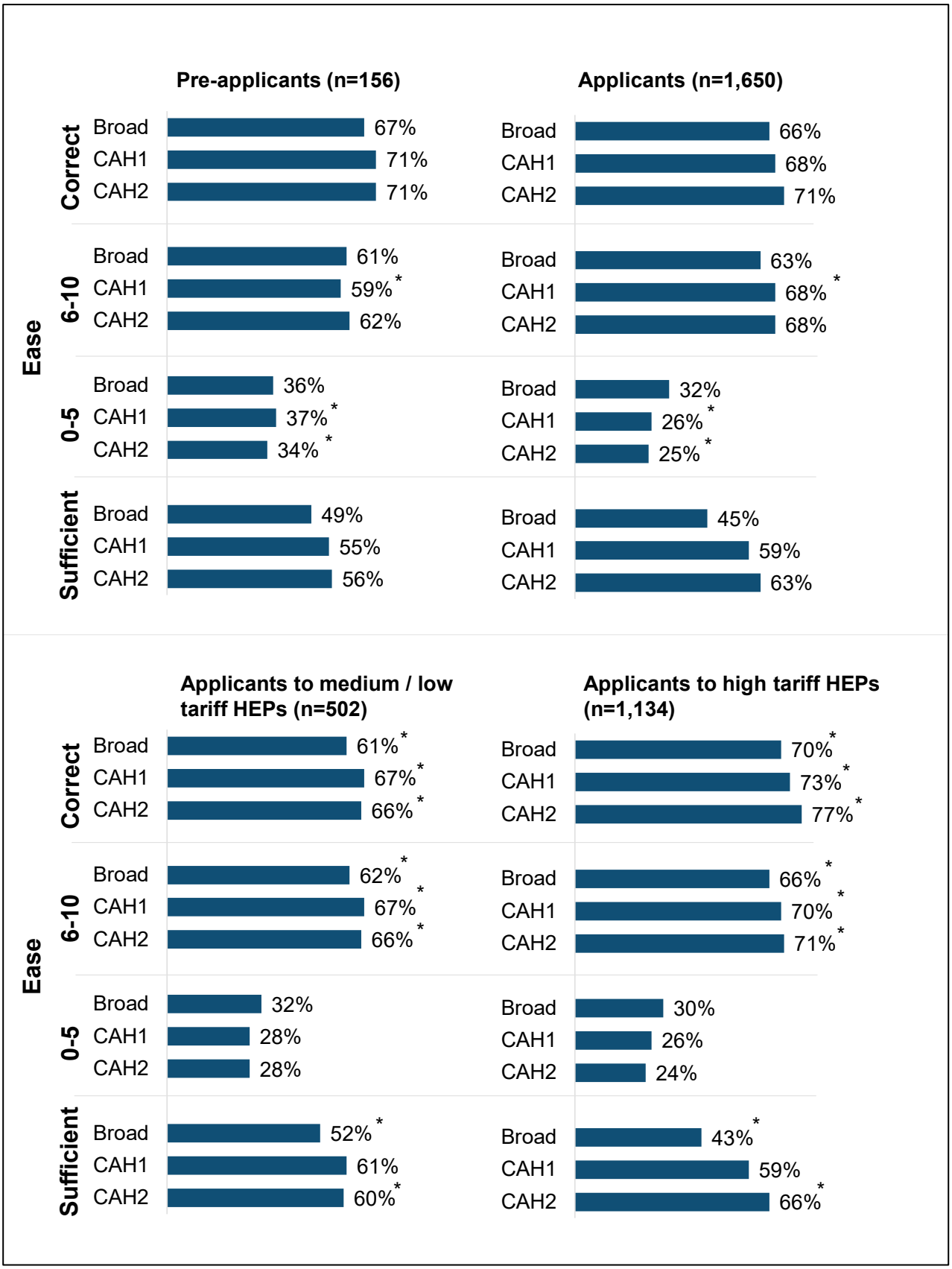


Figure A.3.5 Key measures by domicile and degree level

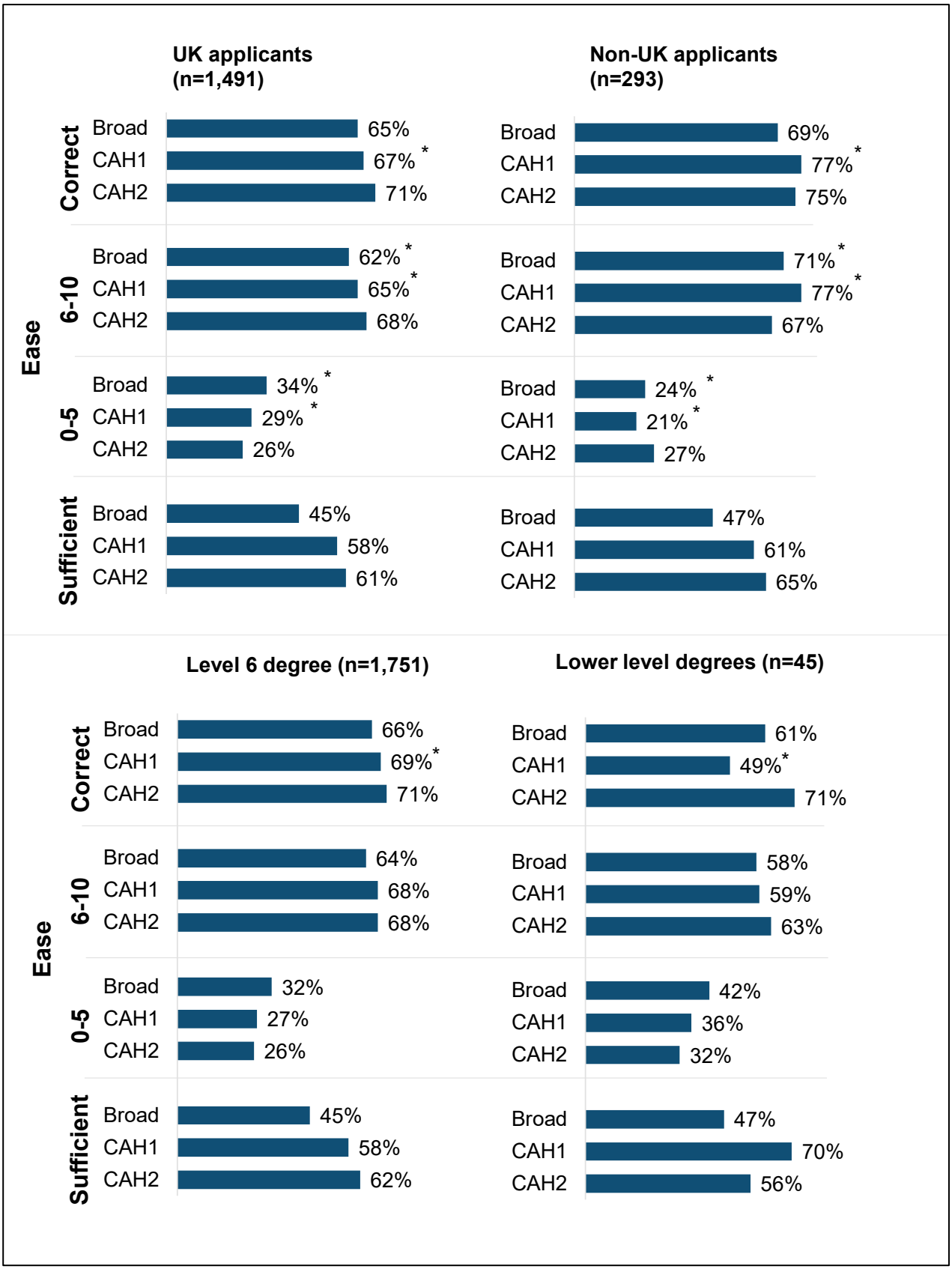


Figure A.3.6 Key measures by HE Provider location

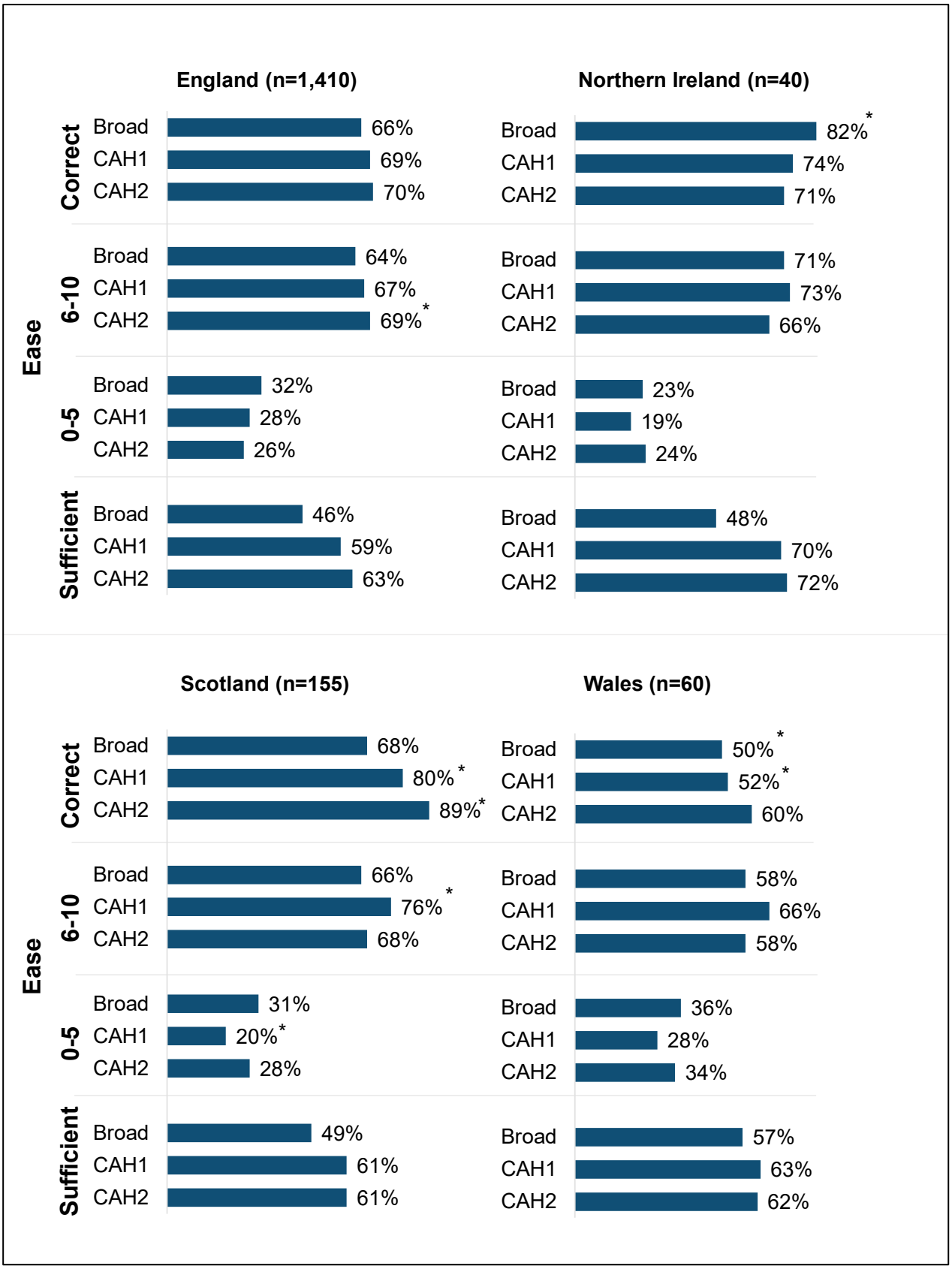


Table A.4.1 Teaching quality and student outcome factors

Factor (trade-off wording)	Factor (satisfaction wording)	Hover-over description
Teaching staff factors		
Whether teaching staff are inspiring and engaging	The engagement of teachers and their ability to inspire	Whether the teaching staff effectively engage their students through: • Innovative teaching methods • An ability to motivate and inspire • Flexibility of teaching methods to suit student needs
Whether teaching staff have teaching qualifications	The teaching qualifications of teaching staff (e.g. professional training or development)	Whether teaching staff have a teaching qualification and/or have undertaken professional training or development about how to teach.
Whether teaching staff have high level academic qualifications such as PhDs	The relevant academic qualifications of teaching staff (e.g. PhD)	Whether teaching staff have a high level academic qualification (i.e. a PhD) in a field relevant to the subject they are teaching
Whether teaching staff are leading experts in industry or business	Teaching staff are experts within their industry or field of study	Whether teaching staff are leading experts in their field due to: • prolonged experience in their field through practice and/or education • being widely recognised as a reliable source of technique or skill
Whether the institution is committed to continuous improvement in teaching	The commitment the institution has made for continuous improvement in teaching	Whether the institution shows commitment to improving its teaching approaches, resources and staff over time.
Whether teaching staff are on permanent contracts	The teaching contracts of staff e.g. whether staff are on permanent contracts	Whether teaching staff are employed by the institution on: • A permanent or fixed term contract (i.e. not a zero hours contract) • A fixed annual income (i.e. are not paid hourly)
Course factors		
Whether students give positive feedback (about the teaching and experience of	How your experience matches the feedback provided by other students	Student feedback about their overall teaching and learning experience at the institution. This could include for example, whether teaching staff are good at explaining things, whether they get timely feedback on their work, or whether they can contact staff when needed.

Factor (trade-off wording)	Factor (satisfaction wording)	Hover-over description
studying at that provider)	(e.g. in the National Student Survey)	
Whether academic standards are rigorous and stretching	The academic standards expected of students are rigorous and stretching	Whether the degree and course design is rigorous, and whether the university maintains high standards: • Students are sufficiently stretched by the course design, standards and assessments • Whether students are encouraged to perform to their full potential • There is no evidence of grade inflation
Whether there are good resources and facilities available to students	The resources and facilities available to students	Whether students have access to a wealth of resources and facilities to support their learning, such as: • Current, industry used, technology • Access to the relevant reading content • Specialist software for the necessary subject areas • Access to specialised areas to conduct research/studies (i.e. medical students have access to labs)
Whether students receive a high number of contact hours	The number of teaching contact hours received	Whether students have an optimum level of contact time to engage them and encourage commitment to learning, including: • contact hours with teaching staff through lectures and seminars • time spent on placements or carrying out field work • time spent in live online learning environments
Whether students are taught in small class sizes	The class sizes e.g. lectures, tutorials	Whether students have optimum class sizes and staff to student ratios to engage them and encourage commitment to learning
Whether students are able to study a variety of subjects	The opportunity to study a range of subjects or modules	Whether students have inter-disciplinary opportunities available to them: • students have the opportunity to study multiple disciplines • students are exposed to a breadth of studies
Whether students are able to specialise deeply in one subject	The opportunity to specialise deeply in one subject area	Whether students have the opportunity for specialisation of their chosen study area, meaning they can either: • focus in depth on just one subject • focus in depth on sub-sets of their chosen subject (for example, specialising in videography as part of a media course).

Factor (trade-off wording)	Factor (satisfaction wording)	Hover-over description
Graduate outcome factors		
Whether students get graduate level jobs after they graduate	The likelihood of obtaining a graduate level job after graduating	Whether previous students have obtained a highly skilled job after their degree
Whether the course boosts students' earning potential	The earning potential following completion of the course	Whether previous students have obtained a high earning job after they graduate or gone on to earn a higher income level
Whether the course leads to a professional qualification	The accredited, professional qualification I will receive	Whether the course is accredited by a professional, statutory and regulatory body, meaning students can go on to get a professional qualification after their degree
Whether students improve their transferable soft skills	The transferrable 'soft' skills gained from the course of study e.g. teamwork, communication, leadership	Whether students are taught transferrable skills as part of their course, for example: • teamwork • writing and presenting • communication • leadership • time and project management
Wider opportunities		
Whether students are exposed to and involved in cutting edge ideas and research	Exposure to and/or the opportunity to become involved in cutting edge ideas and research	Whether the latest research underpins the course design, and whether students: • have exposure to experienced research staff • are engaged in research activities • are taught using the latest ideas/research
Whether students are exposed to and involved with employers, industry and workplace	Exposure to and/or the opportunity to be involved with employers, industry and workplaces (e.g. placements and internships)	Whether students have the opportunity to gain exposure to professional practice, through: • industry placements • internships
Whether students are exposed to and involved in enterprise, innovation and entrepreneurship	Exposure to and/or the opportunity to becoming involved in enterprise, innovation and entrepreneurship	Whether students have the opportunity for involvement in enterprise and entrepreneurship: • learning about and experiencing enterprise is embedded in the curriculum students are encouraged and supported to start their own business • students have access to enterprise and entrepreneurship education, delivered through a careers service

Appendix B: Regression Analysis Methodology

In Chapter 4, the results of a regression analysis are presented, determining the relative importance of twenty teaching quality and student outcome factors in driving overall student satisfaction. This appendix outlines the methodology for this regression analysis, as well as the rationale for choice of this method.

The aims of this regression analysis were to:

- determine the extent to which satisfaction with each teaching quality and student outcome factor drives overall student satisfaction, and
- compare the relative importance of each factor in driving overall student satisfaction as determined by the regression analysis, with the factors considered by students to be relatively most important in determining the overall quality of their undergraduate experience.

A standard regression analysis was considered to be unsuitable for two primary reasons:

- Firstly, comparing the results of the regression analysis and the trade-off analysis in terms of the relative importance of factors would not be possible if factors which were found not to make a significant, unique contribution to the explanatory power of the regression model were screened out, as is common practice in typical regression analyses. As such, all twenty factors were included in the model.
- Given that all twenty factors were to be included in the model, and because the twenty factors were highly correlated with each other, conducting a standard regression analysis with twenty predictors would violate the assumption of a lack of multicollinearity, producing an unstable and unreliable model.

In light of these issues with a standard regression analysis, Correlated Component Regression (CCR) was determined to be most suitable. Correlated Component Regression is a form of regularised regression, designed to stabilise regression coefficients in the presence of many, highly correlated variables. This method is similar to the more widely known Partial Least Squares (PLS) Regression algorithm, although it has been shown to outperform this method in validation samples[25].

CCR and PLS Regression are both component-based forms of regularised regression. To stabilise prediction, linear composite components are created from the individual predictors which are then used as composite predictors in the model.

The use of components reduces noise in the model, which is particularly problematic with many highly correlated predictors and / or small samples. Using this method has been

[25] Magidson, J. (2010). Correlated Component Regression: A Prediction/Classification Methodology for Possibly Many Features. Proceedings of the American Statistical Association.

demonstrated to reduce over-fitting and thus produce better predictions of a hold-out sample.

As with Principal Component Regression, the coefficients can be decomposed back into those for the original underlying predictors. However, both PLS and CCR are superior to Principal Component Regression as the components are optimised to predict the dependent variable, rather than the underlying predictors which is consummate with the goal of regression.

The main advantage of CCR over PLS is that the components are allowed to correlate with each other, which produces better predictions of a hold-out sample[26]. Unlike PLS, CCR is a scale invariant method i.e. transforming the measurement scale does not affect the performance of the model.

In the case of this project, all twenty predictors were included in the model and a two component model was found to perform the best in cross-validation. Results have been decomposed back into the underlying 20 predictors. The Johnson's Relative Weights is the best assessment of the unique contribution to the model taking account of their effect sizes, overall correlation with the dependent variable and correlation with each other[27].

Table B.1 shows the twenty teaching quality and student outcome factors used as predictors in the model. Shown alongside each factor is:

- the unstandardized effect size – the change in the dependent variable resulting from a one unit change in each predictor scale
- the correlation of each predictor with the dependent variable: overall student satisfaction
- Johnson's Relative Weight – the proportionate contribution each predictor makes to R^2.

There are no associated p-values and significance levels for predictors as the model does not make the typical large-sample assumption of the standard, unregularised regression algorithm. For linear regression the specification is selected which maximises the Cross-Validation R-squared, maximising the model's ability to predict new cases. An efficient crossvalidation process is repeated over many iterations which ensures that all sample is used as both training and validation sample across all iterations.

[26] Magidson J. (2013) Correlated Component Regression: Re-thinking Regression in the Presence of Near Collinearity.
[27] Johnson, J. (2000). A Heuristic Method for Estimating the Relative Weight of Predictor Variables in Multiple Regression. Multivariate Behavioral Research.

Table B.1 Regression coefficients and Johnson's Relative Weights for twenty teaching quality and student outcome factors.

Factor	Coefficient	Correlation	Johnson's Relative Weight
The engagement of teachers and their ability to inspire	0.145	0.45	13%
The commitment the institution has made for continuous improvement in teaching	0.131	0.44	12%
How your experience matches the feedback provided by other students (e.g. in the National Student Survey)	0.107	0.41	9%
The academic standards expected of students are rigorous and stretching	0.095	0.39	8%
The resources and facilities available to students	0.072	0.36	6%
The number of teaching contact hours received	0.074	0.33	6%
The opportunity to study a range of subjects or modules	0.060	0.37	6%
The accredited, professional qualification I will receive	0.078	0.34	5%
Teaching staff are experts within their industry or field of study	0.067	0.37	5%
The transferrable 'soft' skills gained from the course of study e.g. teamwork, communication, leadership	0.050	0.32	5%
The likelihood of obtaining a graduate level job after graduating	0.056	0.34	4%
The opportunity to specialise deeply in one subject area	0.017	0.31	4%
The class sizes e.g. lectures, tutorials	0.028	0.27	3%
Exposure to and/or the opportunity to become involved in cutting edge ideas and research	0.022	0.31	3%
The earning potential following completion of the course	0.037	0.27	3%
The teaching qualifications of teaching staff (e.g. professional training or development)	-0.008	0.30	2%
The relevant academic qualifications of teaching staff (e.g. PhD)	-0.001	0.30	2%
Exposure to and/or the opportunity to be involved with employers, industry and workplaces (e.g. placements and internships)	0.015	0.29	2%
Exposure to and/or the opportunity to becoming involved in enterprise, innovation and entrepreneurship	-0.010	0.23	1%
The teaching contracts of staff e.g. whether staff are on permanent contracts	-0.017	0.21	1%

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