

## TEF Year Two Provider Submission

### Provider Context

1. The University's mission is to contribute to society through the pursuit of education, learning, and research at the highest international levels of excellence. Admissions decisions are based solely on academic merit (see para. 18); studying at Cambridge is open to everyone, and the University attracts students from all over the world, and from all backgrounds. Students are offered an outstandingly personalised education that engages, challenges, and stretches them to reach their fullest potential.

2. In 2016, Cambridge topped the Times Higher Education's 'Table of Tables', which is based on the combined results of the UK's three main domestic university rankings, for the fifth consecutive year. The University is sector-leading not only due to its world-class research and outstanding resources, but also due to the way these are used to enhance the University's learning and teaching provision. Students are consistently and frequently engaged with developments from the forefront of research and scholarship, and have numerous opportunities to get involved in research activities both inside and outside the classroom, some of which are described below. Courses are rigorous and intellectually challenging, helping students acquire knowledge, skills and understanding that are highly valued by employers. Moreover, the small-group teaching offered by the Colleges through supervisions allows teaching to be tailored to individual students' interests and provides frequent formative feedback (see paras 7, 8 and 41). The College Tutorial and Direction of Studies systems (see paras 42 and 43) underpin the University's exceptionally high retention rate (98.7%), as indicated by the ++ non-continuation flag in the TEF metrics. Furthermore, as the metrics show, the University achieves consistently outstanding outcomes for its students from all backgrounds, particularly as regards retention and progression to highly-skilled employment and further study. The University is exceptionally successful in equipping its students to achieve positive outcomes after graduation, with ++ flags in 'highly-skilled employment or further study' for every group of students and additional + flags in 'employment' for BME students and students with disabilities.

3. The University of Cambridge is made up of Faculties, some of which are sub-divided into Departments. Faculties are attached to one of six Schools: Arts and Humanities; Biological Sciences; Clinical Medicine; Humanities and Social Sciences; Physical Sciences; and Technology. All Faculties have Faculty Boards, responsible for the quality of teaching and learning in their Faculty and constituent Departments. Faculty Boards take the detailed and informed decisions relating to the education and assessment of students in that subject, and have considerable local autonomy to deliver teaching and learning in the way they determine best suits the needs of their subject and their student body. Faculty Boards are responsible for the quality of teaching to the University's General Board, which is in turn responsible to the University Council. The General Board, Council, and all Faculty Boards have elected student representatives, ensuring students are involved in the University's decision-making at the highest levels and enabling quick, flexible, robust, and focused responses to student needs.

4. The University also comprises 31 constituent Colleges, 29 of which admit undergraduate students, and each of which is a separate legal entity. All students registered for a University degree must also be matriculated members of a College. Colleges are responsible for the selection

and admission of undergraduates, and for the close individual guidance of their studies through Directors of Studies, and pastoral support through Tutors. Colleges engage with their student body in a variety of ways, including through the College students' union, and normally have a committee responsible to the Governing Body or Council for all matters related to education.

5. This Provider Submission has been drafted with input from academics across the University and Colleges. Representatives of the Students' Union were invited to participate, but chose not to do so.

## Teaching Quality

### Student Engagement

6. Undergraduate teaching is provided through a mixture of lectures, seminars and practicals (as appropriate to the subject) arranged by the University, and supervisions usually arranged by each student's College. In supervisions, a small number of students (typically two or three) meet with a subject-specialist teacher for an in-depth discussion of a particular topic. Greatbatch and Holland observed in their literature review for BIS that small class sizes have been shown to improve student engagement and learning outcomes.<sup>1</sup> The majority of supervisions are given by University or College academics or postdoctoral researchers (65% of supervisions in 2015/6), but may also be given by graduate students (23%) or other subject specialists (11%). Anyone appointed as an undergraduate supervisor must take the 'Supervising Undergraduates: An Introduction' training course run by the University's Personal and Professional Development (PPD) team, which ensures supervisors receive guidance in order to help their students get the most out of the supervision so that supervisions support students' independent study effectively (see para. 22).

7. Students have one, two or more hour-long supervisions each week, with some variation depending on subject and year of study. Students on Natural Sciences courses, for instance, may expect four supervisions (in pairs or trios) per week in term time in their first year. The number for a typical Arts and Humanities student is usually lower; perhaps two per week, unless the student is studying an ancient or modern foreign language. Students are expected to attend all scheduled supervisions, and attendance is closely monitored. Students are usually expected to do significant preparatory work before most supervisions. Supervisions thus provide each student with high levels of quality contact time and direct written and oral feedback on their work from academics, providing unsurpassed opportunities for formative assessment.

8. The positive impact and value of supervisions is evidenced by students consistently rating supervisions highly in the NSS. In 2016, 89% of students agreed or strongly agreed with the statement 'I am satisfied with the supervisions my College provides'. Satisfaction rates for supervisions were 90% in 2015, 88% in 2014, and 90% in 2013.

9. NSS results offer clear evidence that Cambridge students find that their 'course is intellectually stimulating' (compulsory question 4), with 95% of students agreeing or strongly agreeing with the

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<sup>1</sup> *Teaching Quality in Higher Education: Literature Review and Qualitative Research*, May 2016, pp.33-4. The HEPI-HEA Student Academic Experience Survey of 2015 revealed that students themselves feel small class sizes are educationally useful: 87% of the 15,129 student respondents from across the UK agreed that they benefit educationally 'a lot' or 'quite a lot' from classes of 1-5 other students.

statement in 2016 and 2015 and 96% agreeing in 2014 (against a sector average of 86% in all three years).

10. Further evidence of students' engagement with their studies is the success of The Student Led Teaching Awards, supported by the Pro-Vice-Chancellor for Education but organised by the students themselves as a 'Students Choice' award for excellent teaching and learning support. Students' engagement with these awards has soared; from 192 nominations received from students in 2014 (the awards' first year) to 703 nominations received in 2016.

11. In addition to the NSS, the collegiate University takes many opportunities to solicit student feedback at course and College level. Student feedback is taken seriously by Faculties and Departments, and has a significant impact on the development of educational provision. Student feedback has in many cases led to changes in course provision: in 2014/15 the Departments of Astrophysics, Classics, Land Economy and Biochemistry all restructured courses in response to students' comments. In Clinical Medicine, the Final MB Examination has been redesigned to take account of student concerns about how Pathology was examined; the new examination format came into effect in 2016. In some cases, student feedback has led to major changes; for instance, the undergraduate degree in Computer Science has been completely restructured in the last two years in response to student feedback. The new '75% Computer Science' degree option was offered to students for the first time in October 2016.

### **Valuing Teaching**

12. The University values high-quality teaching: evidence of 'effective contributions to undergraduate or postgraduate teaching' is a requirement for promotion to the senior academic positions of Professor or Reader, while promotion to the position of University Senior Lecturer requires evidence of 'sustained excellence in teaching'.

13. The Cambridge Centre for Teaching and Learning (CCTL) provides a focus for teaching innovation and excellence by providing training, developing networks for academics, hosting seminars and conferences, and presenting awards for excellent teaching, as well as encouraging and funding innovative teaching projects. It also provides a focus for identification and development of strategic educational priorities within collegiate Cambridge. The CCTL will be cited in Fung, Besters-Dilger and van der Vaart's forthcoming 'Excellent education in research-rich universities: an advice paper' as an example of best practice in the context of creating a framework to support communication and sharing of good practice.<sup>2</sup>

14. CCTL organises an annual Teaching Forum in which Teaching Officers across the University gather to share best practice and explore innovative pedagogical approaches. Last year's event, which attracted 160 participants, included seminars on inclusive teaching, assessment scaffolding, school-to-university transition, and students as co-creators of the curriculum. Topics so far arranged for the 2017 Forum include flipping the classroom, online marking and instant feedback, and Learning Gain. The Learning Gain presentation will be given by an academic from the Faculty of Education who is currently leading a strand of HEFCE's 'Legacy: Measuring Learning Gain in Higher Education' project, and will update her colleagues on the project's findings so far.

15. The University through the CCTL offers its own range of professional development courses, some of which are accredited by the Higher Education Academy (HEA). The Pathways in Higher

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<sup>2</sup> Expected to be published by the League of European Universities in 2017.

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Education Practice course is mandatory for all probationary University Teaching Officers. The University's Personal and Professional Development (PPD) group collaborates with the Colleges' Senior Tutors' Committee to run workshops for new Directors of Studies and Tutors in the Colleges. PPD also delivers an HEA accredited Teaching Associate Programme for doctoral students and early-career postdoctoral researchers. In 2016 the University introduced a Postgraduate Certificate in Teaching and Learning in Higher Education, which is open to all staff involved in teaching at the collegiate University. In addition, the School of Clinical Medicine offers a very popular Postgraduate Certificate in Medical Education, now in its fifth year, and also runs an Integrated Foundation in Medical Education (IFME) offering a six-month foundation programme accredited by the HEA at Associate Fellowship level and recognised by the General Medical Council as an example of excellent practice.

16. The University encourages and rewards excellent and innovative teaching through the annual Pilkington Prize, which was inaugurated and endowed by Sir Alastair Pilkington in 1994. Twelve awards are presented each year by the Vice-Chancellor to academics whose teaching is regarded as exceptional; each Department and Faculty is invited to submit nominations and the winners are selected by a sub-committee of the Steering Committee of the CCTL chaired by the PVC for Education. Recent winners have demonstrated excellence in a variety of ways; some have made outstanding contributions to widening participation and outreach work (in the Department of Geography); some have developed innovative approaches or resources, such as a new online pre-sessional induction course for new students (in Computer Science), or courses delivered through electronic notetaking devices (in the Department of Physiology, Neuroscience and Development; the technology has since been adopted by courses in Engineering and Manufacturing Engineering); while some were rewarded for being outstandingly gifted lecturers and teachers who inspire their students with their enthusiasm for the subject. One winner in 2015, from the Department of Theoretical and Applied Linguistics, hosted a teaching skills exchange with partners at Makerere University in Uganda. Another, in the School of Clinical Medicine, devised an innovative approach to teaching Palliative Care, which has since led to the revision of the UK Association for Palliative Medicine curriculum for undergraduate medical education.

17. The University facilitates innovative teaching through the Teaching and Learning Innovation Fund (TLIF), established in 2010. The TLIF provides project grants of between £10k and £20k each year up to a total of £100k for the development of innovative teaching. The TLIF has provided more than £500k to projects since its inception, some of which have won national acclaim. In 2016 Dr Katharine Hubbard won the Higher Education Bioscience Teacher of the Year Award for her 'Bridging the Gap' project, which was funded by a TLIF award. 'Bridging the Gap', described by the Royal Society of Biology as a 'pioneering course model', created a series of questions and videos designed to improve first-year students' experience of practical sessions and smooth their transition from school to university. Other TLIF-funded projects have included electronic resources for teaching Hebrew developed by the Faculty of Divinity, and the ZeitGeist project in Clinical Medicine that uses real clinical data (anonymised), and virtual reality headsets adapted from the video gaming industry to produce an immersive simulation of a radiotherapy treatment. The technology allows medical students to develop their diagnostic and analytical skills by working through real clinical scenarios at their own pace, and makes it possible to increase the amount of radiotherapy training available to students. In October 2016 the project won additional funding from HEFCE's Catalyst Fund that will enable the prototype to be widely adopted in the University's undergraduate medical teaching in October 2017.

### **Rigour and Stretch**

18. Entrance to Cambridge is competitive and students admitted are academically outstanding. The standard offer is A\*A\*A at A-level for most science subjects, and A\*AA for all other undergraduate courses. Many students score even higher than this, with 61.6% of entrant students admitted in the 2015 cycle having achieved A\*A\*A\* at A-level. Cambridge courses are thorough and challenging, as befits the high calibre of its students.

19. External Examiners commonly comment that the undergraduate degrees offered by Cambridge are some of the highest quality in the UK. In 2016 comments included 'The standards of the scripts was high and there was plenty of evidence of outstanding teaching...I would give it as my judgment that the significant gap between the attainment of Cambridge students and those at a Russell Group university with a good history department is as marked as ever' (first year History); the course 'encourages undergraduates to develop a breadth and depth of knowledge rare even in the best HE institutions' (final year English); 'at a time when at other institutions the important pharmacology content of medical and vet degree courses seems to be shrinking, it is very good to see that this appears not to be the case at Cambridge (second year Medicine and Veterinary medicine); 'this course is a flagship for Physics, not just for Cambridge but for the entire UK' (final year Physics); and 'The overall standards are exceedingly high – I saw many excellent answers to some very difficult questions on some very advanced material. In my view the standard is significantly higher than any other British university except, possibly, Oxford' (final year Mathematics). External Examiners also often commented on the very high quality of students' dissertations, with examiners for more than one course suggesting undergraduates' work was of publishable standard.

20. Throughout their studies, students are subject to continuous formative assessment through the written work submitted for supervisions, which is assessed and commented on by their supervisors. Summative assessments may also include portfolios of coursework, dissertations and project reports. Assessment methods are determined by Faculty Boards to best suit the competency standards of the particular academic subject and thoroughly test the knowledge and skills required of successful graduates. Most courses offer a substantial dissertation or research project, as appropriate to the discipline, allowing students to undertake significant independent research. All courses include rigorous formal examinations at the end of each academical year, which students are required to pass in order to progress to the next year of study.

21. Study at Cambridge is intense. According to data collected in the HEPI-HEA 2015 Student Academic Experience Survey, Cambridge undergraduates typically spend 46 hours per week on academic work during the term; considerably higher than the average for all Higher Education Institutions of 30.5 hours per week. Following a review in 2015-16, precipitated by concerns expressed by some students about workload, courses are required to be clear about their expectations for the number of hours of teaching and independent study a student should do each week. The University designates a maximum student workload of 48 hours per week in term-time.

22. Courses are designed to ensure students spend significant time in independent study, which has been found by the HEA's 2016 UK Engagement Survey (UKES) to be more effective than scheduled classes at helping students develop both academic and transferable skills. The supervision system ensures that students make effective use of their independent study time by providing focused tasks on which they receive detailed feedback. Even in a course like Computer Science, which schedules a relatively high number of contact hours, students spend the majority of

their time in independent study. First-year Computer Science students receive three to four supervisions (in pairs or trios) per week and ten to twelve hours of lectures, meaning that (with a maximum workload of 48 hours per week) they spend up to sixteen hours per week in classes and a minimum of 32 hours per week in independent study in term time.

## **Feedback**

23. The supervision system is highly effective at supporting students' development. As part of their teaching, supervisors provide formative assessment and feedback through detailed comments on a student's work. As supervisions are in very small groups, supervisors are able to provide individualised study skills support as part of their teaching. Students also receive verbal feedback from their supervisors on content, style and approach through detailed discussion during the supervision. The impact and effectiveness of supervision feedback is indicated by the collegiate University's high scores in NSS compulsory question 9 ('Feedback on my work has helped me clarify things I did not understand'); 77% of Cambridge students agreed in 2016 against a sector average of 69%, 79% agreed in 2015 against a sector average of 68%, and 77% agreed in 2014 against a sector average of 66%.

24. In addition to the teaching and formative assessment involved in supervisions, students and their Directors of Studies receive a termly supervision report from each supervisor involved in teaching the student for that particular term. At the end of each term students and their Directors of Studies meet to discuss these reports together, offering further feedback to the student and the opportunity to reflect on the student's progress (for the role of Directors of Studies, see para. 42).

25. In addition, Colleges often organize informal progress tests during the academic year and mock examinations. These provide students with additional invaluable feedback on their progress, which complements feedback given in supervisions. The collegiate University takes the view that feedback through the supervision system is the most appropriate and effective way to support student development, progression and attainment. Students therefore do not receive detailed feedback on the end-of-year examinations aside from their marks. The University is, however, mindful of the need to ensure that students are provided with the best support to improve attainment. As part of the University's ongoing 'root and branch' review of examinations and assessment, it has been decided, drawing on good practice in some subjects, to require all Examination Boards to provide detailed feedback to students, supervisors and Directors of Study on performance at the cohort level, thus improving the provision of feedback on summative as well as formative assessments.

## **Learning Environment**

### **Resources**

26. The collegiate University's resources are world-leading. *The Times and Sunday Times's* Good University Guide 2017 ranked Cambridge first in the UK for 'services and facilities spend', and second in this category in 2016, 2015 and 2014.<sup>3</sup> Cambridge's scores for NSS questions relating to physical and digital resources (questions 16, 17 and 18) significantly exceed the sector average. In 2016, 96% of Cambridge students agreed that 'the library resources and services are good

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<sup>3</sup> The University's raw score for 2017 was 3,446; the raw score is the two-year average of expenditure on academic services and staff and student facilities divided by the total number of full-time students.

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enough for my needs', compared to a sector average of 87% and top quartile average of 89%; 96% agreed that 'I have been able to access general IT resources when I needed to', compared to a sector average of 87% and top quartile average of 91%; and 92% agreed that 'I have been able to access specialised equipment, facilities or rooms when I needed to', compared to a sector average of 82% and top quartile average of 83%.

27. The University Library is a legal deposit library holding more than eight million books, journals and other documents, written in more than 2,000 languages, ranging in age from 3,000 year old manuscripts to the latest electronic journal articles. The electronic resources, which are available to students, are very heavily used, with the Library logging over 7 million downloads from eJournals each year. The University Library's archives, which include some unique collections, are currently being turned into a digital archive so the library's resources will be more freely available to students, researchers and the wider public. The creation of the digital archive is ongoing; work completed so far includes releases of ancient religious documents such as very early Qur'anic parchment fragments and one of the earliest known copies of the Ten Commandments under the 'Foundations of Faith' content strand, and the release of major scientific collections such as the papers of Sir Isaac Newton and the papers that led to Darwin's *The Origin of Species* under the 'Foundations of Science' content strand. One of the Digital Library's goals is to make content from the library's collections freely available for use within teaching and research, and good quality images and texts for download and reuse are created as part of the digitisation work wherever copyright and licensing restrictions will allow. The original material in the University Library is also used creatively in teaching and learning: for instance, the Department of the History of Art runs an annual competition in collaboration with the University Library for a student to curate an exhibition for the library's display cases, based on original material in the library's collections.

28. A study ('FutureLib') is currently underway to evaluate library usage and students' needs in order to ensure that Cambridge's library provision remains world-leading. One outcome already delivered by this project is the 'Spacefinder' app that allows users to search for study spaces, throughout Cambridge and not confined to the University estate, that match their current needs, for instance spaces that are extremely quiet and disciplined or spaces where discussion and groupwork can take place. Facilities and features are also listed for each space, such as Wi-Fi, food and drink, and natural daylight. The app uses GPS technology so that a user accessing it on a phone or a tablet will be alerted to study spaces nearby. Spacefinder has been a big hit with students and attracted over 1000 users in its first month alone. It was described by a Student Union representative as 'so up-to-date and relevant to student life!'

29. Smaller Faculty and Departmental libraries offer students more specialised collections of books, journals, periodicals and electronic resources for particular subjects (such as scores in the Music library). College libraries additionally hold copies of key texts to support the undergraduate curriculum based on reading lists provided by Faculties and Departments, as well as providing important study spaces. Undergraduates have borrowing privileges, with at least 69% of undergraduates recorded as having borrowed a book from the UL, Faculty or Departmental libraries, or their College libraries in 2015-16.<sup>4</sup> The University was commended by the QAA in its 2013 IRENI for accessibility of library resources and the service provided to students.

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<sup>4</sup> It should be noted that this figure refers only to physical books and does not include downloads of eBooks or eJournals (for which the library keeps download figures, but does not record whether the user is an undergraduate).

30. The University is proud of its nine specialist museums and collections, which are used to support and enrich teaching. The Museum of Archaeology and Anthropology, for instance, regularly hosts undergraduate practicals in Archaeology, as well as in a number of other disciplines, and recently used a TLIF award (see para. 17) to purchase a 3D scanner to make detailed models of the most fragile items so they can be used more effectively in teaching. Lectures in the History of Art are regularly held in the University's museums, taught by curatorial staff or visiting experts, and the University's Botanic Gardens are used in teaching undergraduate courses in Plant Science. Research projects using the Garden's facilities have been carried out by students of the University's Departments of Archaeology, Architecture, Computer Science, Earth Sciences, Engineering, Geography, Plant Sciences, and Zoology. The museums and collections also provide additional opportunities for students such as summer internships in the Whipple Museum of the History of Science.

31. Many Faculties and Departments have impressive subject-specific resources; for instance, the Veterinary Centre's facilities include a five-theatre small-animal surgical suite, an equine surgical suite and diagnostic unit, a post-mortem unit, and one of Europe's leading cancer therapy units. The Department of Veterinary Medicine has a laboratory that is open 24/7 so students can practise their skills whenever best suits their schedule, as does the School of Clinical Medicine. Undergraduates in the Department of Genetics can work on individual research projects or with larger research groups in the Fly Facility, a suite of resources and infrastructure for performing experiments on flies including a spacious laboratory with 24 fly workstations and four large Constant Temperature rooms. The Faculty of Music's accommodation includes a professional concert hall seating 500, and a collection of rare and period instruments that students are able to borrow. The Dyson Creativity Centre in the Department of Engineering, opened in May 2016, is a state-of-the-art facility providing workshop space and equipment for students to work on individual or collaborative projects. It hosts a changing menu of large-scale projects which has included the Eco House initiative, created by students from the Departments of Engineering and Architecture, that seeks to innovate sustainable building designs for the developing world; and the Cambridge University Eco Racer (CUER), a solar-powered racing car that competed in the World Solar racing challenge in 2015. CUER is an entirely student-run project that receives industrial sponsorship.

32. University Information Services provides IT services that support teaching, learning, research and administration across the University. Services that support teaching and learning include the Moodle Virtual Learning Environment, used by most Faculties and Departments in their educational provision, and the Drupal Content Management System, which allows individual Faculties, Departments or users like the CCTL (para. 13) to create customized websites reflecting their individual needs and requirements.

33. Digital learning and teaching resources are developed in line with the University's Digital Strategy for Education 2016 – 2020: the University strongly believes that face-to-face interactions such as lectures and supervisions should remain at the heart of the Cambridge educational experience, and that digital technologies should be introduced only when they clearly meet the needs of teachers and learners. Two digital pilot projects are currently underway, one in lecture capture and one in computer-based examinations. The latter is innovative in that it aims to find a way of reproducing the University's traditional three-hour written essay-style examination by exploring technology that fits the assessment in preference to changing the form of the assessment to fit the technology.

34. Consistent with the University's philosophy of local autonomy in the adoption of digital technologies, individual staff members and Faculties and Departments have developed an array of digital resources for use in their own subjects. Many of these are sector-leading, and are used by teachers and learners outside Cambridge as well as within it. Examples include the online learning resources developed by the Department of Materials Science, which are open access and receive around 100,000 page views per week in term time. The Project's webpages not only form the basis of Materials Sciences courses within Cambridge, but are widely used in similar Departments elsewhere. The School of Clinical Medicine has led a UK-wide collaboration of medical schools in the development of a national research database for medical and dental students. In Physics, Cambridge academics were invited by the Institute of Physics to lead a project preparing and disseminating a series of undergraduate teaching materials in Biological Physics which were distributed online with the express intention of enabling other universities to use them in developing their own courses. Launched in 2011, the site's resources have so far been used by at least five UK universities in their courses, with two (Durham and Bristol) each using the site's materials to form the basis of a new undergraduate course. Other examples include the Cambridge Literature timeline hosted by the Faculty of English and developed in collaboration with students, an online visual aid to English literature that is routinely used in teaching bibliographical and research skills to first-years and was described by an External Examiner in 2016 as 'a brilliant resource'; and the new Ancient-Greek to English Lexicon for students being developed in the Faculty of Classics, on which work has been ongoing for the past fifteen years. The Lexicon will be published by Cambridge University Press in 2018, but also made available to students worldwide via the Perseus Digital Library hosted by Tufts University in Massachusetts.

### **Scholarship, Research and Professional Practice**

35. Cambridge University has a strong research profile worldwide. It is consistently placed in the top five in the Academic Ranking of World Universities and QS and *Times Higher Education* World University rankings.<sup>5</sup> The vast majority (89%) of the University's teachers are also active researchers, and are expected to use their research expertise to guide their teaching.<sup>6</sup> The benefits of research-led teaching were explored at an event organised by the CCTL for Directors of Teaching in the University's academic Departments in September 2016.

36. The University's research profile makes it possible for Faculties and Departments to offer substantial and high-quality research projects as part of an undergraduate degree. Final-year projects, particularly in the sciences, may be on active research projects in which students collaborate with academics. Many Faculties and Departments are also able to offer extra-curricular opportunities, for instance through summer research placements. The Department of Engineering manages the Undergraduate Research Opportunities Programme (UROP) which offers funded ten week summer placements in a range of Departments. Around 60-70 projects are offered each year. The programme allows undergraduates the opportunity to undertake a supervised research project to enable them to gain more experience in working in an academic environment, and to develop transferable skills and a deeper understanding of a specific subject area. Recent

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<sup>5</sup> Fourth in the QS World University Rankings in 2016, third in 2015, joint second in 2014. Fourth in the Times Higher Education World University Rankings 2016/17, fourth in 2015/16, and fifth in 2014/15.

<sup>6</sup> Of the 1,876 academic staff members engaged in teaching, 1,661 (89%) were also engaged in research and returned in the REF (figures taken from the most recent HESA Staff return, 31 July 2016).

placements have seen students undertaking projects as diverse as creating flexible, wearable batteries; contributing to the creation of an underground greenhouse in Clapham; developing mathematics to improve model learning in seismic imaging; developing, with input from industrial partners, an online game to provide managers with practical guidance on managing intellectual property; and working with the British Antarctic Survey team (from its base in Cambridge) to analyse carbon distribution data collected in Antarctica, contributing to the first ever study of brown carbon distribution in the Antarctic.

37. Furthermore, collaborative research projects between staff in student services and academics at the University enhance the student experience beyond the traditional 'research-led teaching' model. For example, the University is currently running a 'Mindful Students' research study assessing the effect of taking an eight-week mindfulness course in reducing students' examination anxiety. The study, commissioned by the University committee on Student Health and Wellbeing and delivered by the Department of Psychiatry, will be used to assess and develop the provisions offered by the Counselling Service, improving students' welfare. That students judge the Mindfulness programme to be effective is shown by the fact that students who have completed the course have formed a student society (MindSoc: Cambridge University Mindfulness Society) so that they can continue practising Mindfulness.

38. The Disability Resource Centre (DRC) has similarly been able to benefit from collaborating on research projects with the University's Autism Research Centre (ARC), renowned for its pioneering work. In 2009-2012 the DRC and the Cambridge Lifespan Asperger Syndrome Service, which has links to ARC, undertook a collaborative research project on supporting students with Asperger's Syndrome, which led to the development of many of the University's current support structures for students with Asperger's, including the careers course (see para. 62). The University's Living Laboratory for Sustainability, a branch of the University's Estate Management team, provides opportunities for Cambridge students to undertake research projects to improve environmental sustainability on the University estate, either within their coursework or as extra-curricular volunteer projects.

39. There are also subjects in which the learning environment is enhanced by professional engagement, as well as scholarship. Ten of the University's undergraduate courses are accredited by the appropriate Professional Regulatory and Statutory Bodies. In addition to professional engagement of clinicians in the medical and veterinary courses, all undergraduates in Land Economy have mentors in industry, while all Engineering undergraduates are required to complete six weeks of industrial experience by the end of their third year. The final year of the undergraduate course in Manufacturing Engineering includes provision for an overseas research project; students have recently travelled to research manufacturing practice in the Indian subcontinent and others have studied sustainable manufacturing in California. Every year, first year Architecture students design and build a project with a local organisation; in 2016, students created a playground for pupils at the Cambridge University Primary School using found materials such as railway sleepers, bicycle inner tubes and sections of drainpipe. The undergraduate course in Chemical Engineering is supported by a consortium of ten industrial companies that provide input on content and assist with teaching, and can sponsor undergraduates' final-year research projects.

## **Personalised Learning**

40. Supervisions (para. 7) allow teaching to be tailored in recognition of the individual student's strengths, weaknesses and specific academic interests. It is normal for Colleges to arrange supervision, including for dissertations and projects, by experts from University Departments or other Colleges to expressly match the interests and needs of their undergraduates. It is also possible for the supervisor and Director of Studies to adjust the membership of the supervision group to ensure the dynamic works well. All students in a particular subject normally receive a standard number of supervisions (defined by the Department), but additional supervisions can be offered to students who require additional support or are struggling with particular topics.

41. Moreover, Colleges provide students with high levels of academic and personal support. Each student has a Director of Studies for each subject, appointed by the College, who acts as an academic mentor. The Director of Studies' contact with a student is extensive. Each Director of Studies meets each of his or her students at least twice a term (more often if necessary) to advise on their studies, monitor progress, and discuss supervisors' reports of the student's performance and development. Directors of Studies also liaise with individual Faculties and Departments on the student's behalf if the student is experiencing any difficulties. Each course has a Directors of Studies committee that is the conduit between the Faculty or Department and the Colleges, allowing for the sharing of information about the curriculum and examinations, and supporting the educational partnership between the University and the Colleges.

42. In addition to Directors of Studies who provide academic support, each student has a College personal Tutor who is responsible for pastoral support. Like Directors of Studies, Tutors can liaise as necessary with Faculties, Departments, and if appropriate the Disability Resource Centre and Counselling Service, to ensure students are adequately supported throughout their studies. The consistent personalised support offered by Directors of Studies and Tutors is highly effective at helping students succeed in their studies: *The Times and Sunday Times's Good University Guide for 2017* placed Cambridge first in the UK for degree completion for the third year running.

## **Student Outcomes and Learning Gain**

### **Employment and Further Study**

43. The TEF employability metrics clearly show that Cambridge graduates are exceptionally successful in gaining highly-skilled employment. The metrics show that this is true for every single group, including groups at risk of less positive outcomes such as mature students. The split metrics reveal additional positive flags for 'Employment or further study' for BME and disabled students. According to the Longitudinal DLHE survey of students graduating in 2010/11 (released in September 2015), just 1% of Cambridge graduates were unemployed three years after graduating.<sup>7</sup>

44. Moreover, high numbers of Cambridge graduates choose further study and research. Again according to the Longitudinal DLHE survey of students graduating in 2010/11, 19.6% of Cambridge graduates were in further study or 'work and further study' after three years, compared to 16.7% of Russell Group graduates and 11.1% for the whole HE sector.

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<sup>7</sup> The 2010/11 DLHE surveyed 421 UK-domiciled Cambridge graduates of postgraduate (research) courses, 232 UK-domiciled taught postgraduates, and 942 UK-domiciled undergraduates. Looking at only the undergraduates, the unemployment figure was 0.74%.

45. The Careers Service supports students in securing highly-skilled employment through many initiatives and activities aimed at improving graduates' employability. Perhaps the most innovative of these initiatives is the Service's flagship publication 'CV and Cover Letters'. Written by the Careers Service and frequently revised to ensure it is kept up-to-date, this 80-page guide is expressly tailored to the educational experiences of Cambridge students and since 2015 has been downloaded 10,034 times by registered users of the Careers Service website.

46. The University's Careers Service has a strong Supporters Club, currently consisting of around 120 members representing organisations mainly in finance, law, manufacturing, engineering and management consultancy. Supporters all make a voluntary financial contribution to the running of the Careers Service, which uses this income to benefit all the University's students, not just those contemplating a career in their sectors. Supporters Club members also deliver skills training sessions hosted by the Careers Service, bringing the latest expertise and know-how across a number of key skills.

47. Importantly, the Careers Service offers personalised support to students to find employment that they will find meaningful and fulfilling. The Careers Service runs a very popular event each year entitled 'But I don't want to work in the City' (also captured as a podcast of the same title which has been downloaded over 1000 times), and uses money paid by other recruiters to subsidize representatives from non-profit organizations to attend recruitment events at the University, both practices praised by George Monbiot in *The Guardian* in 2015.<sup>8</sup> Funding from the Supporters Club, together with additional funding from the University, is used to support the Careers Service Summer Bursary Scheme, which allows students to undertake low-paid or unpaid summer placements with companies in the Media, Arts and Heritage or not-for-profit sectors.

### **Employability and Transferable Skills**

48. Cambridge undergraduates are highly sought after by employers. The University consistently ranks in the top three in the *Times Higher Education Supplement's* Global Employability University ranking, coming second in 2015 (the last year for which results are available), first in 2014 and third in 2013. This ranking is based on large samples of employers themselves voting on which universities produce the most employable graduates. The new QS Graduate Employability Rankings (first reported in 2016) also placed Cambridge top in Europe and fourth in the world.

49. Cambridge students develop significant transferable skills during their studies. In supervisions students develop the ability to engage in an academic discussion and debate with an expert on a regular basis, producing skills that employers value highly, such as the ability to formulate and respond to arguments, assimilate complex ideas and information rapidly and accurately, and apply information in new contexts. Across all disciplines, supervisions help undergraduates develop the ability to communicate effectively (in writing and verbally) and present ideas, evaluate evidence critically, and solve problems. The University's expectations for independent study, challenging work schedule and assessment through end-of-year examinations also help students develop the ability to manage their resources and time, to prioritise and to meet deadlines. The Careers Service provides data on graduate employment and careers engagement for the University's periodic reviews of Faculties and Departments, to help assess how effective courses are in providing students with skills for life and employment.

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<sup>8</sup> 'Amputating Life Close to its Base', *The Guardian* 3 June 2015.

50. In addition to the subject-specific and transferrable skills students develop through their studies, some degree programmes, such as Architecture and Engineering, offer courses in Management to better provide their students with the skills and knowledge they will need to be immediately effective in their careers. The University also offers undergraduates the opportunity to spend their final year pursuing Management Studies at the Judge Business School.

51. To assist students in gaining skills employers value, the University's Language Centre offers extra-curricular courses and conversation groups in a range of languages, at levels from beginner to advanced, and provides a wealth of online resources, underpinned by in-person support, for learning over 170 languages through self-study. The Language Centre also offers specialist foreign-language courses tailored to specific subjects, often co-taught with the relevant Department, such as various 'Languages for Medics' and 'German for Music'. The Language Centre has developed online materials that are sent to all international students before they arrive in Cambridge, to smooth their transition both to university and to studying in English.

52. Many Cambridge students are very actively involved in enterprise and entrepreneurship through clubs and societies. Cambridge University Technology and Enterprise Club (CUTEC) is a leading student-run organization that seeks to nurture and enhance the entrepreneurial spirit amongst academics and students. It hosts the annual Technology Ventures Conference which connects entrepreneurs, academics, investors and business professionals in Cambridge. The most recent conference attracted 402 attendees including high-profile venture capitalists, entrepreneurs and investors representing over 200 companies or institutions from 10 different countries.

53. Cambridge University Entrepreneurs (CUE), another student society, runs an extensive programme of events and networking opportunities, as well as one of the most successful business creation competitions in the world. The competition, supported by the Careers Service, is run by students and open to staff, students and alumni. Over the last seventeen years it has had over 1000 entries and awarded £500,000 in prize money, and the companies set up during the course of the CUE Business Creation Competition have raised more than £100m of further funding.

54. For students interested in using entrepreneurship specifically to tackle social challenges, Cambridge Hub, a student-led group supported by the Careers Service, offers volunteering opportunities with 121 local organisations, research and consultancy placements through the Social Innovation Programme and summer internships through the Social Impact Internship Scheme.

### **Positive Outcomes for All**

55. As the metrics show, Cambridge students have a very high continuation rate, and graduates of the collegiate University are exceptionally successful in gaining highly-skilled employment. The split metrics for employment reveal additional positive flags for disabled and BME students. BME students exceed their benchmarks for both 'employment and further study' and 'highly-skilled employment and further study' by higher margins than 'white' students do.<sup>9</sup>

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<sup>9</sup> The difference between indicator and benchmark is 2.8 for BME students in 'employment' and 9.1 in highly-skilled employment, compared to 0.9 in employment and 8.9 in highly-skilled employment for students not identified as BME.

56. The collegiate system at Cambridge allows targeted academic and pastoral support to assist all students, appropriate to individual needs. There are four Colleges which accept mature undergraduate and graduate students only and which can therefore provide support tailored to meet the particular needs of this group of students, including helping students find childcare places in one of the University's nurseries and organising study skills and employment skills seminars specially designed for mature students. Several Colleges offer tailored support for female students, the three women-only Colleges leading the way in this regard. For instance, Newnham College organises Life Skills seminars throughout the academical year that are open to all the University's female students.

57. In addition, the University is committed to the principle that no student should be deterred from applying to the University because of financial difficulties and offers an unlimited number of bursaries to students from low-income backgrounds through the Cambridge Bursary Scheme. 2630 bursaries were awarded in 2015-16, 1804 of which were at the maximum amount of £3,500, awarded to students whose household income is less than £25,000 per year (1328 of these were to students whose household income is less than £15,000 per year, the proxy for eligibility for Free School Meals whilst in secondary school). Colleges also make available, from their own resources, bursaries to support students in need of financial support. In January 2015 the University received 856 responses from bursary recipients to a survey of attitudes towards bursary provision both generally and at the University of Cambridge. Of those students from low-income backgrounds (as defined by eligibility for Free School Meals), 20.6% said that they would not have gone to university if bursaries had been unavailable; 43.1% said that the bursary offered was a deciding or very important factor in their choice of institution; and 44.1% said that without a bursary they could not continue their studies.

58. Each College provides induction and generalised study skills support for students throughout the first term. In addition, Faculties and Departments provide subject-specific inductions. The first-year Mathematical Biology course, for instance, was redesigned in 2015-16 and a package of teaching and support measures put in place to ensure that students develop the mathematical skills they need to study Biology, while the Department of History and Philosophy of Science offers induction and support for students from scientific backgrounds needing to acquire or refresh the knowledge and skills necessary for study in Humanities subjects, such as essay-writing. The Faculty of Law provides a day-long induction course for all incoming undergraduates. This course is constructed in collaboration with and financially supported by Freshfields Bruckhaus Deringer, one of the world's leading commercial law firms.

59. The University recognises that the intensity of a Cambridge education exposes students to potential stress, and offers counselling and mental health support. Pastoral support provided through the College tutorial system is highly effective in identifying and supporting students experiencing mental health problems, and the University also has a well-resourced Counselling Service. The Strategy for Student Wellbeing is overseen by the University Committee on Student Health and Wellbeing, which reports to the General Board's Education Committee to ensure educational and welfare policies are developed together and are mutually reinforcing. In addition, the Student Advice Service, run by the Students' Union, offers free, confidential and independent support to students.

60. The Disability Resource Centre (DRC) offers various kinds of support for students with disabilities. It also runs courses for academic staff on teaching disabled students and, with the Counselling Service, on supporting students with mental health difficulties. The DRC administers

several funds to support disabled students in their education, such as the Reasonable Adjustments Fund, the International Disabled Students' Fund, the Disabled Students' Bursary Fund and the Charlie Bayne Travel Trust.

61. The DRC has a highly effective programme of support for students with Asperger's Syndrome and for the staff supporting them, which grew out of a pilot study that ran from 2009 to 2012 (see para. 39). The Centre now has a full-time Disability Adviser dedicated to the requirements of students with Asperger's and high-functioning autism. The Adviser works closely with Faculties, Departments and Colleges to support the provision of targeted interventions throughout the year, including specialist mentoring and other human support, and an induction programme for entrant students to ensure they are familiar with their new environments and routine before term starts.

62. There is also a dedicated Careers Course for students with Asperger's run jointly by the DRC and the Careers Service (see para. 39), which has now been running for four years and has been praised within the industry as an example of best practice. The Careers Service also employs a disability advisor. The high level of career support for students with disabilities, provided by the DRC and the Careers Service working in close partnership, is reflected in the collegiate University's positive flags for both employment and highly-skilled employment for disabled students. Students identified as having a disability actually exceed their benchmark for 'employment' by a greater margin than students not identified as having a disability.<sup>10</sup>

63. The DRC also provides targeted support and induction events for students with Specific Learning Disabilities. The Centre's initial assessment and diagnostic assessment process for students with SpLDs has been recognised by The Professional Association of Teachers of Students with Specific Learning Difficulties as being a model of best practice in Higher Education. The highly effective support provided to disabled students through the specially trained staff in the DRC, and the network of Disability Liaison Offices in Colleges, Faculties and Departments, was highlighted by the QAA as an example of best practice in its 2013 report following the IRENI visit.

64. The University's core values are freedom of thought and expression, and freedom from discrimination, and it strives to be inclusive and welcoming to all its staff and students. Cambridge was a founder member of the Athena SWAN Charter and the University won its first award in the inaugural round of March 2006. Since then, the University has successfully renewed its Bronze Athena SWAN award in 2009 and 2012 and in 2014 achieved a Silver Athena SWAN award. In November 2015 the University further signalled its support for diversity by hosting the national pre-launch celebration event for Lesbian, Gay, Bisexual and Trans History Month 2016, during which University officials joined representatives of local city councils, health services and emergency services in signing the Cambridgeshire Equality Pledge affirming the University's and the community's respect and support for diversity and commitment to making Cambridge open and welcoming to all.

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<sup>10</sup> See 'Difference (indicators – benchmark)' sheet in the metrics; students identified as having a disability register a positive difference of 2.1 in the employment category, while for other students the difference is 1.1.