

**Institution: Nottingham Trent University (NTU)****1. Context and mission**

Nottingham Trent University (NTU) is experiencing 'a period of unprecedented success' (Good University Guide, 2018), recognised by three University of the Year awards since 2017. This derives from rigorous implementation of its institutional strategy - 'Creating the University of the Future' - articulated under five strategic themes in 2015. One strategic theme was Valuing Ideas, focused on research, innovation and impact.

NTU's research has attracted specific accolades, including the Queen's Anniversary Prize, 2015, for research into safety and security. Nottingham Business School (NBS) gained EQUIS accreditation following forensic examination of its research credentials. Research teams in the School of Social Sciences (SoSS) won the Office of National Statistics Research Excellence Award, 2019. Professor Carole Perry from the School of Science and Technology (SST) received a Royal Society Wolfson Merit Award. Professor Paul Evans, also from SST, was appointed a Royal Society Wolfson Fellow, given the Institute of Physics Dennis Gabor Medal and Prize, and the THE Award for Outstanding Contribution to Innovation and Technology.

Valuing Ideas foregrounds partnership. This REF period has seen the commencement of research collaborations with the Universities of Birmingham, King's College London, and Southampton on economic development, student access and participation, and e-textiles, respectively. NTU is a lead organisation in the Doctoral Training Alliance (DTA) of 20 universities across England and a member of both the AHRC Midlands4Cities (M4C) Doctoral Training Partnership (DTPship) and the Biotechnology and Biological Sciences Research Council (BBSRC) Doctoral Training Programme (DTProg). NTU has created a unique civic partnership with the University of Nottingham: Universities for Nottingham.

Strong relationships internationally include a growing portfolio of research collaborations and joint doctoral programmes. These include: NBS's joint appointments with Copenhagen Business School; the School of Architecture Design and the Built Environment's (ADBE) work with the universities of Mosul and Wasit (and Leeds and Durham) on preserving the cultural heritage of Iraq; and the SoSS Skin Integrity Group's partnership with the universities of Tokyo and Montpellier. Doctoral programmes include: EU Horizon 2020 International Training Network with 16 European partners; joint award programmes with IIT Bombay in STEM and social sciences; and with Universidade Catolica Portuguesa (Porto) and Universitat Ramon Llull (Barcelona) in Applied Psychology.

Outside academia, partnership underpins formal strategic agreements with local public service organisations and major businesses that enable research that drives innovation. This is exemplified by NTU's professional doctorate offer – with 113 completions in this REF cycle – and by multi award-winning place-based research in the SoSS on reducing reoffending amongst sexual offenders with HMP Whatton and work by NBS to enable Boots, the largest private local employer, to tackle the gender pay gap.

NTU is amongst the ten largest universities in the UK. It enrolled over 34,000 students, encompassing almost 800 postgraduate research students, in 2019/20. They are taught by over 2,000 academic staff, up by over 400 since July 2013, representing a cumulative increased investment in academic capacity of around £25m per annum. Furthermore, since 2015 NTU has invested significantly in enhancing academic leadership, reaching £1.4m every year in 2020. Overall, these investments have resulted in 421 academics being returned in REF 2021 compared to 267 in REF 2014.

Annual income stood at £330 million in 2019/20, of which over £20 million was funding body grants. NTU benefits from philanthropic donations to support research, such as £2.82 million from the van Geest Foundation Cancer Research Fund. It has spent £45m on facilities that support research and enterprise within a £166m capital programme over the REF period.

NTU has nurtured synergies across mature disciplinary research strengths to build five areas of research priority: Health and Wellbeing; Medical Technologies and Advanced Materials; Global Heritage; Sustainable Futures; and Safety and Security of Citizens and Society. These priorities reflect the mission in Valuing Ideas to 'change the world' and to 'working across boundaries'. They align to UN Sustainable Development Goals, connect to UK grand challenges in research and innovation in the Industrial Strategy, and map to the Midlands Engine regional goals. Each priority area is led by a multi-disciplinary team sustained by resources totalling £1.8m across the REF cycle.

Investment in research leadership is exemplified by appointment of eight Associate Deans for Research (ADRs, one per School), who have strengthened NTU's network of research centres to realise its commitment to 'intellectual depth'. The NTU Doctoral School has been re-energised to enhance the experience of doctoral candidates, achieving above sector-average overall satisfaction score of 82% in PRES 2019. Twenty-two posts have been created in newly-centralised research development and support teams - an annual investment of £1.13m - to complement specialist input to researchers from finance and legal services.

Achieving impact through innovation is central to Valuing Ideas. Nottingham has a large concentration of Small and Medium Sized Enterprises (SMEs). Consequently, the University has invested £8m in a new Enterprise and Innovation Centre co-funded by Ministry for Housing, Communities and Local Government (MHCLG) and the D2N2 Local Enterprise Partnership (LEP).

Over the REF period, NTU has match funded £10m to European Structural and Investment Fund (ESIF) grants of £13.7m, enabling engagement with over 1800 businesses; this represents one of the largest support programmes to SMES in the UK. The D2N2 LEP put £9.7m towards the £23m cost of the Medical Technology Innovation Facility (MTIF), which has a dual base on NTU's Clifton Campus and the Boots City site, and £0.8m towards the Smart Wireless Innovation Facility (SWIFt, a collaboration with Digital Catapult).

## 2. Strategy

Valuing Ideas sets out the University's strategic research vision to: "possess strong relationships and robust processes that enable discovery, drive innovation, and change the world, our students, and ourselves"; and "promote our disciplinary breadth, our intellectual depth, and our commitment to working across boundaries". The Board of Governors adopted two Key Performance Indicators (KPIs) to monitor delivery of NTU's research ambitions: number of registered doctoral students; and research grant and contract income. The following paragraphs describe delivery on the commitments within Valuing Ideas.

**'We will implement a robust strategy to expand our research excellence and further our capability and capacity to be a valued partner in projects of high commercial and public salience'**

This undertaking drove investment of over £4m every year into front-line research through QR funding and £3.5m of University resources to a PGR Scholarship Fund. Another £1.4m per annum supported the creation of research leadership posts, including the new role of Deputy Vice-Chancellor - Research and Enterprise. ADRs brought senior disciplinary expertise and experience to generating school research plans and enhancing collegiate research environments. These school research plans shape the institutional-level research and innovation policies through the Academic Research Leadership Team (ARLT). Established in 2015, ARLT has championed new research centres, identified NTU's five priority research areas, and led activity around research ethics, integrity and impact. ADRs are also members of both the University Research Committee and University Leadership Team, putting research at the heart of institutional decision making.

Two further posts support the DVC (R&E), leading new teams on Knowledge Exchange and Enterprise, thus linking academics better with funders, partners and collaborators. As a result, local businesses have been able to deliver 51 new to market products and introduce 324 new to firm products. The University has made 40 new patent applications and created four new spin outs that joined an existing portfolio of five companies, with total estimated external investment of £1,338,000; the most recent was into Halo X Ray Technologies Ltd which secured £500,000. There have been 23 jointly-funded collaborative PhDs since 2017 and 13 KTPs, together worth over £2.5m.

Nottingham Civic Exchange is an NTU-funded Think Tank focused on the local impact of its research. By investing £737k since 2015, academics have enhanced the influence of their research on topics such as modern slavery. This regional focus underpins NTU sponsoring the Nottingham Festival of Science and Curiosity, a programme of over sixty free events focused on science, engineering and technology.

During the REF period, NTU has created six posts in a Strategic Partnerships team to stimulate relationships with major private and public service enterprises, for example, Nottingham Universities Hospitals Trust (NUHT) and Fujitsu. Formal agreements set out programmes of mutual activity to drive knowledge exchange. This team also facilitates cultural partnerships where NTU has put £1m into its relationships with Nottingham Castle Trust, Nottingham Contemporary, Nottingham Playhouse and Nottingham UNESCO City of Literature.

NTU has invested £245k in bespoke public affairs support over the last five years. This has facilitated academic colleagues in optimising the impact of their research on politicians and policy-makers. NTU academics have submitted 38 evidence statements to Parliamentary Select Committees since 2014 and made at least ten appearances.

A constructive relationship with the media is central to impact. Three members of the communications team develop stories derived from research. Since 2014, more than 1,150 NTU research news stories have appeared in national and international media, alongside almost 4,000 stories where academics have provided expert comment. They have featured: on BBC Radio 4's Today Programme, World at One and In Our Time; on BBC TV's Breakfast, Newsnight and The One Show as well as Sky News; and on the front pages of The Times, Sunday Times and Daily Telegraph.

NTU was one of the initial partners of thought-leadership website, The Conversation. This platform has carried some 635 pieces from NTU academics, amassing almost 29 million views. In 2019, NTU was top among UK universities for total readership, attracting 5.5 million views globally and reproduction in prestigious outlets such as The Washington Post and Scientific American.

#### **'We will develop and nurture the next generation of researchers'**

The Doctoral School provides comprehensive support, skills training, and community focus for all postgraduate researchers. NTU is proud of the diversity of its doctoral cohort; in 2019/19, 28% of UK-domiciled PGRs identified as BAME, which is considerably above the sector average. Growth has been driven by significant investment in circa 60 new awards per annum for PhD scholarships for both Home/EU and international students, alongside 123 government sponsored PGRs and 33 externally sponsored collaborative programmes including partnerships with the Environment Agency and the Max Planck Institute for Dynamics and Self-Organisation.

NTU established the ground-breaking University Alliance DTA in Applied Biosciences for Health and led roll-out of this multi-partner cohort-based national doctoral training partnership to Energy and Social Policy. It delivers a cross-disciplinary training programme to nearly 200 postgraduate researchers, of which NTU has hosted 18. A Marie Skłodowska-Curie PhD Fellowship programme, where NTU hosts eight fellows, has brought international researchers into the partnership.

NTU is a long-standing partner in the AHRC M4C DTPship, where 8 Midlands universities train the next generation of arts and humanities researchers. NTU has secured 62 awards across M4C and its predecessor, M3C. The University is a full partner within the BBSRC DTProg led by the University of Nottingham.

Doctoral researchers are encompassed within the remit of NTU's Success for All Steering Group. Chaired by the Vice-Chancellor, this brings sector-leading data and focused action plans to bear on any characteristics that indicate that our students may not fulfil their academic potential.

The Scholarship Projects for Undergraduate Research (SPUR) and associated departmental schemes offer bursaries for NTU undergraduate students to contribute to staff research projects. To date, 436 projects have been awarded bursaries worth more than £500,000 across 77 subject areas.

#### **'Our commitment to working across boundaries ...'**

NTU's strategic focus on addressing key societal challenges necessitates interdisciplinary approaches, as represented by its five priority research areas outlined above. Within each area, NTU researchers from disparate disciplines collaborate within and beyond the institution. Each priority has senior academic leadership with responsibility for committing up to £120k pa.

During 2020, NTU has selected one of these priority areas - Cultural Heritage - as its first Research Peak. The development of these priorities into peaks will serve to highlight both their current excellence and future potential. NTU has allocated an annual budget of £500k to enhance research in this initial peak, in particular to develop further international collaboration.

The boundaries NTU crosses are not just disciplinary. The NTU Global team plays a key role, investing £691k in seed-corn funding for individual and institutional international collaborations since 2016. This has led to NTU's partnership with Panjab University in India which has generated two GIAN and one Commonwealth Rutherford Awards. Through such initiatives, internationally co-authored papers have risen from 29.4% in 2014 to 58.8% in 2020.

#### **'Robust processes that enable discovery, drive innovation, and change the world ...'**

An effective research strategy has to be underpinned by robust research policies and procedures. NTU is fully compliant with the relevant research-related concordats. These inform the University's practice around research ethics and integrity, research environment, support and training for researchers, public engagement and knowledge exchange.

NTU publishes an annual statement on research integrity, detailing initiatives to embed institutional culture around research integrity. NTU is committed to transparency regarding research misconduct; on rare occasions where such misconduct is substantiated, anonymised details of the misconduct and corrective measures appear in the annual statement. In 2018, a review of research integrity led to the establishment of the University Research Integrity Committee charged with providing institutional oversight.

Publication Policy and Research Data Management Policy support researchers by maximising the impact of their research outputs through open access and open data. NTU's Institutional Repository (IRep) enables the sharing of outputs internally and externally. NTU policies go beyond the REF open access policy, requiring full text deposit of datasets and book chapters, as well journal articles and conference proceedings with an ISSN. Both Open Access and Open Data have been supported through £318k of strategic investment.

#### ***The next five years***

*'We have defined, resourced, and promoted a compelling portfolio of world-class research and innovation. We have created new ways for collaborators to share in the spirit of creativity and curiosity that characterises our research, scholarship, and practice.'*

This statement refreshes the overarching ambition for the Valuing Ideas theme within NTU's 2020-2025 strategy, *University, reimagined*. The theme focuses on four topics; for each there is a major new approach that will build on progress since 2014.

*1. We will focus our attention on challenges that are as relevant to our stakeholders locally and regionally as they are of global concern, partnering with outstanding institutions that share our aspirations and recognise our contributions.*

NTU will support its strongest research and research leaders in areas of continuing international salience for policy and practice. These will be supported by investment that will enable proactive recruitment, support established and early career colleagues, and underpin enhanced partnerships with universities around the world.

In terms of intellectual focus, in addition to Global Heritage, NTU will build on external funding into the MTIF and Smart Wireless Innovation Facility (SWIFt, a collaboration with Digital Catapult) and progress within its Health and Wellbeing and Medical Technologies and Advanced Materials research priority areas to develop the next generation of health care interventions. Academics in the Safety and Security of Citizens and Society priority area have been leading the Cabinet Office's C-19 Foresight Group on the response to the pandemic. NTU will expand its research and practice to support frontline responders and local resilience fora in dealing with future emergencies. Colleagues in the Sustainable Futures area will be central to the contribution Universities for Nottingham will make to the achievement of local, regional and national commitments to net zero carbon emissions.

*2. We will transform our international reputation through shaping a research narrative based on excellence and impact that generates esteem, stimulates collaboration and establishes opportunities.*

NTU has some of the UK's most adept academics in using social media to promote their research and its implications. Learning from this experience and expertise, NTU will create bespoke social media platforms that enable all of its researchers to disseminate their work.

*3. We will extend our collaboration with scholars, partners and other stakeholders through original deployment of new technology.*

Even before the impact of Covid-19, NTU was aware that the manner in which international research collaborations were pursued was becoming unsustainable. NTU is developing a 'Virtual Institute of Advanced Studies' to facilitate such collaborations, in part through its partnership with Microsoft.

*4. We will accelerate our performance in commercialisation and consultancy to share our insights in ways that benefit our partners, our society and our University.*

NTU will select a small number of areas of intellectual property for the application of a new model of external consultancy.

### **3. People**

#### ***Equality, Diversity and Inclusion***

NTU's commitment to EDI is deep-rooted and led from the top. In 2014, the incoming VC created and chaired an EDI Steering Group to champion initiatives: an institution-wide campaign

promoting respect as a core value; staff networks promoting the perspectives of Women, Disability, LGBT+ and BAME; and the launch of a mandatory unconscious bias online training module. More recently, transgender awareness and white privilege training have taken place for key staff groups, including the University Executive Team.

In April 2019, NTU secured Athena SWAN Institutional Bronze Award, one of the KPIs set by the Board of Governors. This recognition is in part based on a four-year action plan resourced with circa £750,000 of targeted financial investment. Components implemented included:

- funding 15 Aurora places each year for female academics;
- paying for an Athena Swan Champion in every academic school;
- providing personal mentoring to female associate professors to accelerate their applications for promotion; and
- creating 'Women in Academia' that supports all women as they pursue their research and career goals.

NTU has a comprehensive schedule for Athena Swan accreditation for academic departments, with Psychology and Sports Science receiving their Bronze Awards in November 2019 and October 2020, respectively.

NTU is a member of Stonewall's Diversity Champions, holds Disability Confident Employer status, and has enrolled in Advance HE's Race Equality Charter. In December 2020, it published its Race Equality Action Plan. This incorporates a VC Mentoring Scheme for associate professors who identify as BAME. NTU champions transparency: ethnicity pay gap data are published alongside annual gender pay gap reporting.

NTU data illustrate that amongst senior roles, inclusive of academic roles, both women and BAME colleagues are underrepresented. NTU has set explicit targets to increase female representation within the professoriate and improve BAME representation within leadership positions.

All colleagues are eligible to make flexible working requests under the Flexible Working (Right to Request) Policy. This policy is complemented by Parental Leave and Special Leave policies. NTU has a Support for Academic Returners scheme which provides individual awards of £5k to help academics re-establish their research after returning from caring responsibilities.

NTU runs a biennial staff survey. The 2018 survey found that that NTU's key strengths as an employer are: appraisals; a safe and secure working environment; supportive work colleagues; and high levels of staff satisfaction with their work and the quality of service they deliver to students and others. 91% of staff gave a positive response on questions related to equality of opportunity. NTU's CROS (Careers in Research, Online Survey) 2019 results showed that over 94% of early-career research staff agreed the University is committed to equality and diversity.

### **Appraisal Process**

These positive perceptions are underpinned by NTU's appraisal system, where institutional ambitions are balanced with individual aspirations. Completion rates of appraisals are another institutional KPI, with 98.5% conducted in 2019.

Appraisals have two components: the agreement of personal objectives; and the definition of support and development that will enable delivery. During this REF cycle, we have implemented three career pathways which mean every academic possesses the objectives best suited to their focus: Teaching and Practice; Teaching and Research; and Teaching and Scholarship.

Consulted on with staff and agreed with NTU's University and College Union branch, it was introduced fully in 2018/19. Academics on the Teaching and Research Pathway have significant responsibility for research and are given workload allowance for research. They develop their

appraisal objectives through working with ADRs and Research Centre Directors to produce an annual Individual Research Plan. This framework facilitates the setting of research objectives appropriate to both career stage and discipline. It underpins a financial reward system that recognises outstanding and exceptional contributions by academic colleagues each year.

This approach to appraisal is the foundation of other important activities that promote and recognise research. These include School-led sabbatical schemes - 88 since 2014 - and the Vice-Chancellor's Outstanding Researcher Awards (since 2015/16, 25 recipients have also been given small grants to accelerate their research.)

This appraisal process has enabled: streamlining probation and progression from entry at lecturer level to top of senior lecturer scale; ensuring academic promotion is based on transparent performance criteria; and movement within professorial bands - and creation of Distinguished Professors - rooted in individual contributions.

Thus, appraisal lies at the heart of our commitment to equality, diversity and inclusion: progression, promotion, recognition and reward are based solely on merit.

### ***Support and Development for PGRs and Early Career Researchers***

NTU received the HR Excellence in Research Award in January 2013 and endorses the revised Concordat to Support the Career Development of Researchers. Adherence is managed through the Concordat Management Group, overseen by University Research Committee. In 2017 NTU introduced School Concordat Champions to embed this work at a local level. The most recent external peer review of the University's policies and practices related to the Concordat praised the "considerable buy-in of the senior management and the Board of Governors" which in its view had "clearly impacted on the pace of change and the culture of research at NTU".

NTU has established a termly ECR Forum which encourages researchers to share their views and undertake personal and professional development. This provides rolling induction for new researchers, an opportunity to update on the Valuing Ideas strategic theme, and a platform to raise issues. This forum includes training and information sessions such as: Communicating Research; Career Development; Understanding the REF; and Open Access and Responsible Use of Metrics.

NTU has developed a bespoke "Winning Grant Funding" programme for early-career researchers. This trains ~30 early-career researchers in biennial cohorts by providing mentorship and masterclasses on proposal development, pathways to impact and development of external partnerships; 50% of attendees have gone on to secure significant or high-esteem grant funding.

All researchers have access to a comprehensive suite of blended training and development mapped to the Researcher Development Framework. Attendance data show an annual average of 490 individual instances. The latest CROS data show that 72% of ECRs agree that the University encourages them to engage in personal and career development.

The NTU Doctoral School (DS) is responsible for doctoral training and administration. All doctoral candidates are supervised by at least two supervisors to oversee research planning and progress, with 12 mandatory meetings each year. Doctoral researchers produce interim and annual monitoring reports to ensure timely progression. The University's rate of full-time submission within four years was 78% in 2017/18.

All doctoral researchers enrol on NTU Doctorate Plus. This comprises a comprehensive annual programme of workshops, training and events designed to support personal and professional development, complementing school and research centre provision. NTU records an annual average of 980 individual bookings and satisfaction rates scored 3.2% above the

global sector benchmark in 2019. The DS organises an annual Doctoral Research Festival, which shows attendance regularly above 30% of the doctoral community.

NTU has worked hard to ensure PGR representation on research-related committees at school and institutional levels. The DS hosts a regular forum to ensure open communication with the doctoral community. A Nottingham Trent Students Union (NTSU) sabbatical officer attends PGR induction and feedback events and PGR students are a key constituency in the NTU Student Voice campaign. NTSU has supported the election of PGR Student Representatives since September 2017 and co-delivers Student Representative training and development. Locally, PGR students are actively involved in organising seminar series and school research conferences.

**4. Income, infrastructure and facilities**

***Research Activity and Income***

NTU views research income generation as both a key indicator of peer-esteem and a vital method of generating research excellence and strong impact. During this REF period, research grant spend per annum has risen by 40% despite lockdown reducing income in 2019-20.

| Year    | Institutional Income (million) | HESA data (million) |
|---------|--------------------------------|---------------------|
| 2019-20 | £330                           | £7.0                |
| 2018-19 | £313                           | £7.4                |
| 2017-18 | £290.3                         | £7.2                |
| 2016-17 | £271.8                         | £6.7                |
| 2015-16 | £258.5                         | £6                  |
| 2014-15 | £225.4                         | £5.9                |
| 2013-14 | £213.2                         | £5.0                |

NTU’s investment in research development capacity, allied to a co-ordinated approach to the management of research support processes, procedures and policies, have supported NTU researchers in submitting more and better applications to external funders. In the academic year before these investments took full effect - 2016/17 - 395 applications totalled £38.5 million. Of these, 115 (29%) were successful, resulting in £5.7 million of new awards. In 2019/20, 477 applications were submitted, totalling £94.5m. Of these, 126 (26.42%) were successful, resulting in £13.7 million of future research income.

NTU has deployed QR income strategically through complementary processes:

1. Institutional Research Themes: £1.8 million has been allocated across the five research priorities so interdisciplinary teams can develop responses to key challenges; and
2. School Research Plans: £18.9m has been distributed to each school for allocation locally against agreed objectives;

Both processes have included significant funding for pilot studies or early stage projects which have contributed to the development of more substantial, often multi-partner and multi-disciplinary, projects with associated external funding applications.

Overall, in the REF period, over £25m of QR has been invested to develop research.

***Infrastructure and Facilities***

In Spring 2019, NTU launched a research lifecycle Research Information Management



System (Worktribe). This £1.14 million investment represented a step change in the management of research, supporting growth in research activity and impact and assisting compliance with external funders' regulatory requirements. It is used to process, manage and report on all applications for external research income.

£45 million has been invested in capital schemes which have transformed research capacity.

At the Clifton campus, research facilities available to physical and life sciences have been enriched as part of wider schemes:

- £11m Interdisciplinary Science and Technology Engagement Centre (ISTEC), supported by a £5m contribution from HEFCE, to provide significant additional laboratory space;
- £23m dual-site MTIF supported by £9.7m from the D2N2 LEP; and
- £23m Engineering Building which houses laboratories, workshops and studios.

There has been major investment in equipment, for example a cutting-edge dedicated Imaging Suite, featuring:

- Atomic force microscope (Dimension ICON AFM, purchased 2016 for £185k);
- Scanning electron microscope (Jeol FEG SEM JSM-7100F + EDX, purchased 2015 for £250k); and
- Transmission electron microscope (Jeol JEM 2010 TEM, replaced 2019 for £640k)

On the City campus, research facilities have been expanded for a range of disciplines, including £2.3m for SoSS psychology research and £510k for ADBE to refurbish and re-equip laboratory space.

At Brackenhurst, the School of Animal, Rural and Environmental Sciences has benefited from:

- £820k poultry nutrition unit;
- £280k glasshouse, growth rooms and container farm for vertical farming research;
- £230k integrated water energy food facility; and
- New research labs for environmental and geospatial research as part of a £12m teaching and research centre.