Research and Knowledge Exchange Strategy: 2017-2027

From its inception Salford has been a university committed to the production of foundational research and its application through partnership working. Today, this approach is exemplified and maintained through the Industrial Collaboration Zones (ICZs). Our research vision seeks to capture this spirit by drawing on the inspiration of Salford’s most famous scientist, James Prescott Joule, who believed in both pure and applied research.

We face a world where technological advances are transforming societies and how we live, work and play. But the speed and nature of change is placing strains on our ability to cope, both individually and collectively. And all this is within a global context where human domination over the planet is rapidly altering the physical environment making some places inhabitable for us or other species. This process is known as the Anthropocene era and the interplay between it, technological innovation and society, is our core research mission.

These challenges are complex and interlinked and will require researchers that are equipped to work enthusiastically across disciplinary borders using a wide range of methodologies and technologies. We already have a strong research community, containing many world leading researchers. This strategy seeks to give them the tools to enhance their performance to meet the challenges of our research mission.
Research and Knowledge Exchange strategy summary

Vision

We embody the spirit of James Prescott Joule, Salford’s most famous scientist, in uniting our human desire for inquisitiveness with the imperative for practical application.

Mission

To be recognised as a global leader of research addressing the challenges of living in the Anthropocene epoch.

Values

Our values as a research community are aligned with the University’s core values, and have been developed for and by our researchers. These values underpin our research culture as a friendly place to work and provide the platform on which we deliver our vision and mission for the future of research and knowledge exchange. We will:

1. Empower and nurture our inclusive and diverse community of researchers to undertake excellent and rigorous, world leading research
2. Maintain the highest standards of ethics and integrity in our research
3. Transcend traditional disciplinary boundaries to deliver innovative fundamental and applied research with impact
4. Co-create and co-deliver our research with academia, industries, and communities
5. Strive to embed research into the heart of our innovative developments in teaching
6. Seek to benefit societies and environments across the world through our research
7. Achieve international recognition through our local, national and worldwide research, partnerships and impact
8. Be cognizant and address issues of sustainability in our research design and activity.

Key objectives

1. Work with industry and wider-society to produce internationally excellent research that utilises technology to create state-of-the-art solutions to the challenges of innovation, productivity, sustainability and resilience.
2. In collaboration with our industry partners, to produce research-literate graduates and post-graduates, conversant with the latest technologies and practices, who will bring creativity and innovation into the workplace.
3. Through ICZs, to deliver an integrated, two-way knowledge exchange pathway from excellent discovery research, through applied research in partnership with industry, to exploitation, impact, and teaching.
4. To work with our researchers to establish international, national and local partnerships with higher education, industry, and communities globally. While also working across Greater Manchester, and the wider public to co-create, and expand the reach and significance of our research to deliver impact.
5. To be an international leader and destination of choice for researcher training and career development, providing a supportive and inclusive research environment which produces a high-quality pipeline of future research leaders. Enable all excellent researchers, post-graduate and early career researchers to achieve their potential.
Introduction and context

There have been significant changes in both the University and the external environment since the 2014-2020 University Research strategy was agreed in May 2014, which drive the need for a new strategic approach to research and knowledge exchange. The aim is for this strategy is, therefore, to implement game-changing frameworks to enable the University to transform our research and knowledge exchange support and performance to achieve our key objectives and our KPIs.

Internally, we have seen new institutional and research leadership, and the implementation of the University’s single strategy priority – the Industry Collaboration Zones (ICZs). Alignment and integration of research to the ICZs is critical to the performance of both, and this strategy will achieve that objective through the consolidation of our world leading and internationally excellent research strengths into the five Beacons, aligned with the ICZs. Research and knowledge exchange has the potential to make a significant contribution to undergraduate student experience and employability and our TEF performance, and mechanisms to achieve this are proposed. Since achievement of our Athena SWAN Bronze award, there has been a renewed focus on inclusion and diversity in our research base, with programmes underway to support career pathways across all strands of the University’s business.

Externally, the changes to REF, the threats to EU funding due to Brexit, the release of the Government’s Industrial Strategy, and the uncertainty around tuition fees require a very different strategic approach to research and knowledge exchange at the University. With the broadening of the staff submission to REF, there is a need to consolidate investment and resource to the highest performing research staff, and those with the best potential. This strategy will embed an inclusive, diverse and meritocratic research culture which enables excellent researchers to fulfil their potential. We will adhere to the principles of integrity, excellence, accountability, and openness to ensure that our research can deliver genuine impacts to society, either directly or through our partnerships with industry.

Externally, the 2017 National Industrial Strategy and the Global Challenges fund represent a step change in the research and knowledge exchange funding landscape, and provide an extraordinary opportunity for Salford, with our long history and strategy for industry engagement. This will require the creation and expansion of diverse and high quality external networks, encompassing industry, Russell Group and other HEI collaborations, local/regional government and international partners. The Government’s stated objective is for UK investment in R&D to reach 2.4% of GDP by 2027. The Government’s £7bn investment will take this to 1.75%; the remainder must come from increased R&D investment by industry. It is, therefore, likely that there will be a suite of Government incentives and tax breaks to encourage industry to increase investment in R&D. This Research and Knowledge Exchange strategy, aligned with the ICZ strategy, places the University in a fantastic position to take advantage of these opportunities.

The Government will release its draft International Research and Innovation Strategy jointly with UKRI in spring 2018, and it is recognised that the growth in the UK research output since the 1970s has largely come from international collaboration, with more than half of UK research outputs having international co-authors. The objectives of the International Research and Innovation strategy will be to: pursue excellence in science and research; sustainable economic growth; addressing global challenges and increasing UK global influence. This strategy will be delivered through: excellence and growth through international partnerships; mobility; access to global infrastructure; enhancing business capability to invest globally; and influencing global economic prosperity, security, health and wellbeing through maximising our official development assistance (ODA) research. This strategy will link through to education and skills development, and we will work to ensure that research is fully integrated into the
University’s international strategy, using our overseas research partnerships and our brand to support international student recruitment. The Beacons, working with ICZs, will be the focus of driving forward high quality international research partnerships.

Finally, the proposed Knowledge Exchange Framework (KEF) will focus on: generating knowledge through research; transmitting knowledge through teaching; and translating knowledge into practical areas. The creation of a Knowledge Exchange Portal will enhance our ability to generate new, and expand existing partnership opportunities. It will ensure effective professional services support, integrated with ICZs and the wider University business.

**Merging our history and our future**

Ever since we were envisaged as a university, Salford was seen by policymakers as a technical university, focused on science and engineering and, more recently, health related research. Salford, and our fellow late 1960s institutions, were seen as serving their host city-regions and driving the economic development of their conurbations, through both teaching and research. The clear intention was that this would be developed in close collaboration and partnership with industry. As Lord Robbins’ 1963 Government report on Higher education made clear:

> The links between university institutions and government research establishments and industry should be strengthened by freer movement of staff and more joint arrangements for research and the supervision of research; and the institutions should invite more part-time teaching assistance from the research establishments and from industry.

Today, 50 years after its charter, the University of Salford fulfils Robbins’ original vision through our Industry Collaboration Zones and this Research and Knowledge Exchange strategy seeks to reaffirm our historic commitment to serving the people of our city-region, through a commitment to research excellence, knowledge exchange, and leadership in technology, innovation, health and the wider environment.

Much has changed since 1963. The environment was mentioned only six times by Robbins, all linked to educational culture. Climate Change and the effect of human activity on the planet and other life-forms were not part of the intellectual debate. If Robbins was writing today we are sure the environment would be at the core of any proposal for a new type of university. That is why our mission overtly accepts that we are now living in the new Anthropocene epoch – one where human activity is the defining influence on our planet, and one where we need to bring our research capacity and knowledge around technology and innovation to create a city-region, and world, fit for all life-forms, and where human activity works with nature. In this, we embrace people-based research. Individual and population-level health and wellbeing, the challenges of an ageing population and the battle against chronic illnesses are part of our commitment to building a better life for all in this new epoch. Key to this will be solving housing, energy, social care and medical, and wider environmental problems, both locally and across the planet to create resilient and sustainable communities, balanced with the environment.

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1 The University of Salford merged in 1996 with University College Salford. The latter concentrated on health care and sciences, and the arts. Today, these form a major part of the university’s areas of research excellence and we will continue to invest in these areas. We have recently opened the £60m New Adelphi building for the arts and cultural activities, the Campus masterplan proposes a Health Village on the Allerton site.

The challenge is that to achieve this requires a vibrant economy; building this without causing irrevocable damage to planet Earth requires a commitment to technological innovation, improved and sustainable productivity, and efficient use of resources. Fortuitously this aligns to the needs of the UK economy, and is the priority of the Government’s Industrial Strategy. Economies do not exist outside their societies, and we recognise the need to invest our resources in developing the resilience, leadership and sustainability of our communities, balanced with the ethical, societal and economic need to protect our planet’s natural capital.

**Our Commitment to Equality, Diversity and Inclusion**

The University of Salford’s commitment to equality, diversity and inclusion lies at the heart of our research and knowledge exchange strategy and underpins all of its key objectives. We will demonstrate that commitment by celebrating difference and promoting equality of opportunity in a genuinely sustainable and responsible manner. This includes displaying distinctive behaviours that inspire and influence all of our stakeholders, whether local, regional or global to follow our lead. We will achieve this by showcasing the ways in which only a truly inclusive research culture which fosters principles of fairness, social justice and dignity can lead to the type of innovation and creativity needed to address and find solutions to critical questions around the impact of human activity on our planet.
Research and Knowledge Exchange Strategy Framework

We are living through an age of enormous technological advances, where the application of this technology is disrupting and, in some cases, destroying existing industries. Everything from retail to taxis, from banks to the car industry. In industries as diverse as sport and health, new technologies such as AI & Robotics, VR, big data, Automation, are just beginning to realise their transformative capacity. Yet, there is paradox here. Unlike in previous technological shifts there has not been a significant global shift in productivity. This is even more pronounced in the UK where we lag behind our competitors, although national data masks huge regional variations where productivity in London mirrors that of Germany, while the North West is 25% less productive. Not only does this have a detrimental impact on businesses and their profitability, it limits pay for employees, resulting in lower living standards; and is more harmful to the environment. As the resources of the planet are limited and their under-utilisation leads to more waste and greater strain on services, any prosperous future for humanity will require more efficient use of our existing activity.

With the advances in bio-medicine and the use of gene-therapy and nanotechnology, it is possible that the first immortal human has already been born! At the very least the number of centenarians will continue to rise inexorably. How do we build a world for an ever-ageing population, how will it change the nature of work, and what does this do to retirement and our existing welfare and support services? Simultaneously, in 2015 46 million people worldwide were living with Dementia; this figure is expected to reach 75 million by 2030. At the same time, new superbugs are becoming resistant to most, if not all antibiotics, posing a global threat to human life if we should fall ill. How do we use technology and bio-medicine to tackle these challenges, and what does this mean for care and rehabilitation? How can we design a society to manage an ageing population, whilst Climate Change is causing sudden cataclysmic events?

At the heart of the Anthropocene epoch is the rapid transformation of the environment. We are living in age of mass extinction, where 177 mammal species have lost 80% of their populations over the last century, a third of the 27,000 vertebrate species have declined, and the amount of liveable space is in retreat. We are losing rainforest at an alarming rate, with 17% of the Amazon rainforest gone in the last 50 years. The seas are becoming more polluted and rising sea levels are flooding existing coastal habitats. As the Earth warms and the polar ice caps melt, the seas become increasingly desalinated, however the future impact on sea life and the humans who depend on it is unknown. For humans, the questions about food supply and food chains become more pressing, whilst bio-diversity and healthy natural capital are necessary for a viable planet and a good quality of life for all life forms. Noise reduction and limiting air pollution are essential to living well in urban area, and improvements in these can transform healthcare and the attractiveness of a place, while the threats, and sometimes opportunities, posed by radiation and nuclear accidents are ever present.

There is a limitless supply of energy on Earth, the challenge is selecting the most appropriate source to minimise disruption to people and the planet, and then designing mechanism for its extraction and utilisation. But new technologies around energy production are insufficient to re-establish a better-quality environment. We also need to look at energy efficiency and finding ways to make it easier for industry and households to use less energy, and use it more effectively. Yet fuel poverty remains a global phenomenon, and in the UK over 2.3 million households suffering from this. We also need energy to build the housing of the future. We already have a global housing shortages; with the reduction in liveable space, and the predicted population rise to 9 billion, how can we build the homes of the future? What materials should they be built from, what should they look like, and what services and technology
should they contain? Equally, the new housing will need infrastructure to connect both the residents and the houses themselves, increasingly this is through new technology.

The environmental challenges, the technological revolution, and the changes in the nature of health and wellbeing, are bearing down on our lives, families, communities and countries. We live in age of fake news and mass confusion about truth, and we face threats we neither understand, nor have the tools to properly assess the associated risks. We now have the technology to fulfil Orwell’s dystopian nightmare, yet what ethical boundaries and protections around civil society and democracy are we willing to place? Fortunately, armed conflict between states has declined, but we face new types of threats, both from non-state actors and states that wish to disrupt our society and cause division through asymmetric warfare. How do build our resilience to these and what role can culture and the arts play in uniting, and re-uniting, fractured, communities? Not only do we need more resilience, we also need to improve the quality of our leadership, across all fields and spheres if we are to be prepared for life in the Anthropocene epoch.

**Key questions**

We have distilled these many and varied questions into a series of five high level research questions which will shape our research endeavour in the decade ahead:

How can we live well in the Anthropocene epoch, in which the impacts of human activity dominate our planet’s climate and environment?

1. How can innovations in technology deliver improved productivity?
2. How can we live well for longer?
3. How can we house 9 billion people sustainably?
4. How can we maintain a planet which is beneficial for humankind and all other lifeforms?
5. How can we manage crises without undermining civil society?
**Research and Knowledge Exchange Beacons**

To answer these questions, and deliver our Research and Knowledge Exchange strategy, we will create five interdisciplinary and cross-sector Research and Knowledge Exchange Beacons, built around our world leading and internationally excellent research strengths, aligned to ICZs and mapped to our five key strategic questions, within which we will consolidate and support clusters with the potential to become global leaders over the next decade.

1. **Industry 4.0**³ (includes robotics & AI, health technology & bio-mechanics, Sport 4.0 and internet of Things, smart futures)
2. **Successful Ageing and Bio-health** (cancer research and Institute of Dementia; diagnostic imaging; movement, rehabilitation, robotics & AI, & smart cities)
3. **Energy, housing & infrastructure** (Energy House 2, SHUSU, robotics & AI & Smart cities)
4. **Sustainability and Environmental Quality** (environmental cluster in ELS and noise research from acoustics; digital built environment; future cities; robotics & AI)
5. **Resilience & Leadership** (ThinkLab, social science; politics and contemporary history; culture and communication; equity, health and wellbeing; psychology; smart and liveable cities; robotics & AI)

The core functions of the beacons will be the:

1. Strategic focus of research activity and, consequently, investment and support.
2. Centres for multi-disciplinary research excellence
3. Sites of critical mass where we can engage as a meaningful partner for industry and other HEIs
4. Core of our research reputation and brand for external marketing.
5. Strengthening the connection between research and the ICZs to support strategic priorities of the latter.

Beacons will be outward facing and aligned to the strategic priorities of the major funding programmes. They will comprise vibrant communities of researchers from across the University, coming together with industry, HEI and community partners to build critical mass and a strong culture of research excellence, to provide innovative solutions to the key societal, industrial and global challenges. It is intended that Beacons will be interdisciplinary, dynamic and porous, with researchers and industry partners able to move and collaborate seamlessly across ICZs, Beacons and Schools. We are looking to build research teams, as groups of a significant size are necessary to deliver sustained global leadership through critical mass, while ensuring resilience and stability should individual staff depart. To support this transition, we will place greater emphasis on rewarding research leaders who can construct and develop teams and build strong external networks and provide a supportive and inclusive culture with a commitment to research excellence.

Beacons will work across the University, Schools and disciplines to develop our global areas of excellence. They will be the centrepiece of our offer and how we promote and market our research, and we will target investment to these areas. Beacons will tell our story as an institution, and will be a key focus for driving forward our research brand and reputation, and supporting recruitment of under- and post-graduate students. The vision of each Beacon will be the key question, which will be underpinned

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³ Industry 4.0 incorporates automation, data, robotics, AI, Internet of Things and VR across most sectors and industries.
by strategic development and delivery plans to drive innovative research, knowledge transfer and impact, achieving significant increases across all our key delivery areas.

At its core each beacon will contain a peak of excellence where there will be a concentration of resources. It is these in areas where the university will seek to establish global leadership activity. The exact loci will be established once the Beacon Directors are place. This will also shape research priorities within the Campus Masterplan to inform capital investment and ensure a fit with the ICZ strategy.

Of course there will always be researchers and PGR students beyond the edges of the beacons and ICZ interface. It is often the work done in this space that transforms future research agendas, both within and without the university. If this work is fulfilling our research KPIs we will continue to provide support to these academics and PGRs, while ensuring our strategic university investment is targeted at addressing the Research and Knowledge Exchange priorities. We recognise that resources are finite and this may result in some competition for support. In such cases we will ensure the decisions are made in a fair and transparent manner, within a framework where the research beacons will be prioritised.

**Figure 1: Research Network Relationship between ICZs, Schools and Beacons**

As indicted in Figure 1 the Research and Knowledge Exchange strategy and the Beacons will be underpinned by the disciplinary and thematic excellence that will continue to be developed in our Schools. They will continue to be responsible for maintaining a strong and inclusive research culture and ecosystem which enables researchers to achieve their potential. Part of this involves working with Beacon Directors to identify and invest in strategic research priority areas, recruiting senior research leaders where appropriate, and building capacity through targeted recruitment of high performing/high potential early career researchers. It is expected that all Schools would have secured Athena SWAN bronze status by March 2019 (application by November 2018). Schools will continue to be responsible for individual academic performance through the production of research outputs, securing more research grant and other funding, production of impact case studies and external engagement activity, the link to the ICZs, delivery against KEF metrics, and local supervision and support of PGRs. Schools remain the host for disciplinary based research and the contribution of subject specialists to the wider
environment, promoting and demonstrating evidence of a positive research culture. They will maintain responsibility for the operational leadership and management within school, including internal peer review, distribution of workload, individual 5-year research plans and the research element of PDRs. RKE will work in partnership with schools to coordinate the mentoring scheme to deliver an internationally leading researcher development training programme to build and enhance the capacity and capability of all researchers. Further consultation will take place in the development of the detailed implementation of this strategy, alongside which schools will produce related strategically focused action plans.

**Knowledge Exchange Portal**

The current funding model from the research councils means that research activity does not receive adequate income to cover its costs; even when QR money is taken into account, research workload allocations and other necessary infrastructural costs are not fully supported by research income streams. This often requires the costs of research to be partially subsidised by income generated from international student fees. Research delivers considerable indirect benefits to universities, not least in terms of reputation and status, which are critical to recruitment, the ability to attract international and industry partners, and strengthening relationships with strategic stakeholders. Research also acts as an important means to attract highly skilled academics, who are committed to research-informed teaching. Putting a value in this additionality is problematic, however; and it results in research having to justify its place within a university in these terms.

We see these challenges as connected and we will create a Knowledge Exchange Portal to maximise the potential from research projects and identify potential partnerships, opportunities for our researchers and further routes to exploitation and income generation from existing partnerships. Research projects will be wrapped within a supportive framework in which direct benefits can be secured to support any funding gap and to produce new income streams.

**Doctoral School**

Establishing a Doctoral School will create a single identity which can offer a clear profile and status for doctoral candidates, contributing to more effective marketing and recruitment, particularly in relation to sponsored students; and offering a unified platform to celebrate our research.

We regard PGR students as an integral part of the research community, and high quality PGR outputs will contribute significantly more to REF and the growth of research and enterprise generally. We will celebrate PGR successes internally and externally. We will also bring forward plans to ensure all our PGRs qualify for a Higher Education higher level research specialism apprenticeship.

In support of PGR career development, and transition from PGR to academic careers, we will establish a range of activities focussed on moving to the next career stage, drawing on the experience of ECRs and more senior staff.

**Our Researchers: Salford Circles of Success**

At the heart of our Research and Knowledge Exchange strategy are our academics and postgraduate students. Their vision and creativity deliver our commitment to produce original and applied research. In a world of daunting transformation, both technological and social, we are determined to produce a
workforce capable of addressing the research challenges of today and the future. To support this, we will raise the standard and quality of the research and knowledge exchange support and development provided to our academics. The University’s success is dependent upon our academics’ success. We are determined to develop and retain our best quality staff and seek to recruit highly qualified researchers when posts become available.

Our staff are at many stages of their careers but their commitment to research excellence unites them. The intensity and exact nature of support required will be tailored to their individual needs. We call this process the Salford Circles of Success (Figure 2).

**Figure 2: Our Researchers: Salford’s Circles of Success**

- **1. The Researcher**
- **2. Data**
- **3. Individualised Training**
- **4. Mentoring & Feedback**
- **5. Research Quality**
- **6. Accountability & Performance**
- **7. Research & KE Leadership**
- **8. Culture of Celebrating Excellence**

**Research Methods, Management and Integrity Unit**

High quality, robust research methodology is critical for research originality, rigour and significance, and bid development. For many funding bodies, poor quality research methodology will result in research bids not being recommended for funding. Good quality research design, methodology and analyses were
cited as being critical pillars in tackling unavoidable waste in research⁴, and are of paramount importance with the increasing prevalence of collaborative bids involving teams of researchers from different disciplines, institutions and countries. Research methods are also constantly evolving; quantitative methods arising from technological opportunities, use of data, algorithms and biomarkers; and innovations in qualitative research, particularly in the social sciences. We want our colleagues to be at forefront of these debates and embrace these new working practices, however the University currently does not have any central repository of research methods expertise or training available to all researchers. Expertise is scattered within Schools, and there are gaps in robust medical statistics and health economics expertise, which may limit our ability to secure funding, particularly in health-related research. Strengthening the quality and innovation of our research methods will result in better quality outputs and funding applications, while journal articles featuring new methodological insights invariably reach a wider audience beyond the subject matter and thus have higher citation rates and potential for wide-reaching impact.

Beyond formal research methodology, we are only beginning to explore the potential of methodological issues that arise when working with industry, and best practice to address these. As our partnerships expand and become deeper we will secure more knowledge and capture good practice to share with colleagues and inform research-industry links. The political emphasis on the connections between universities and business, which will be a feature of the KEF, means that we can play a key national role in shaping this agenda.

Consequently, we will establish a Research Methods, Management & Integrity unit within RKE to deliver against these twin objectives. We will seek to either second a leading methods specialist from within the institution, or recruit externally, to create and lead the unit, supported by staff within RKE. The philosophy of the unit is that methods support should be more than the exchange of knowledge. It should also be a resource researchers can use to undertake fieldwork. Over time our plan is to resource the unit so it can manage fieldwork on behalf of the research community and employ students on placements to gain experience in undertaking fieldwork.

**ICZ Pedagogic Research Centre**

As we move to the implementation phase of the ICZ Readiness initiative we should begin to articulate the unique teaching methods involved in introducing students into industry and working with industry to design and deliver programmes. This should be a centrepiece of our pedagogic work at Salford and be how we make a singular contribution to teaching and learning knowledge. However, to do this we need a mechanism and vehicle to capture good practice, and a forum to share and analyse this, resulting in the publication of research outputs. Over time this could be commercialised, particularly for the international market.

Such a centre of excellence will serve to promote ICZ related research-informed teaching at Salford, demonstrate the benefit of research to students, and be a creative space for innovation and new thinking pedagogic research. It will also contribute to the infrastructure necessary for the teaching and learning aspect of the academic career pathway.

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**Key Performance Indicators**

As detailed in the previous section, to deliver our research ambitions we will ensure that:

1. We deliver high quality interdisciplinary research, aligned with ICZs and external markets to deliver **return on investment**
2. We build and retain the **necessary talent** to deliver and grow **high quality research**
3. We maximise our reputation and brand to increase the **reach and impact** of our research
4. We deliver high quality research training and community to **maximise the success of our PGRs**

<table>
<thead>
<tr>
<th>Return on investment</th>
<th>Research grants and contracts income</th>
<th>External investment is an indicator of the quality and market alignment of our research, and is correlated with REF performance</th>
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<tbody>
<tr>
<td></td>
<td>Research awards</td>
<td>REF performance is a measure of the quality of our research. Percentage of staff with significant responsibility for research (research active) is an indicator of our capacity and capability for high quality research, and the diversity of our researcher population – growing this through recruitment is critical</td>
</tr>
<tr>
<td>Research quality</td>
<td>REF performance</td>
<td>REF performance is a measure of the quality of our research. Percentage of staff with significant responsibility for research (research active) is an indicator of our capacity and capability for high quality research, and the diversity of our researcher population – growing this through recruitment is critical</td>
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<td></td>
<td>% research active staff</td>
<td>REF performance is a measure of the quality of our research. Percentage of staff with significant responsibility for research (research active) is an indicator of our capacity and capability for high quality research, and the diversity of our researcher population – growing this through recruitment is critical</td>
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<td></td>
<td>% new academic staff with PhD</td>
<td>REF performance is a measure of the quality of our research. Percentage of staff with significant responsibility for research (research active) is an indicator of our capacity and capability for high quality research, and the diversity of our researcher population – growing this through recruitment is critical</td>
</tr>
<tr>
<td>Research reputation</td>
<td>Field weighted citation impact</td>
<td>Citations of our research publications are linked to the reputation of our researchers, indicate the reach and impact of our research, and are a key factor in league table positions. Industry and international collaborations further increase our reputation and reach. The metric takes into account discipline differences in citation rates</td>
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<td>and reach</td>
<td>% outputs with international co-authors</td>
<td>Citations of our research publications are linked to the reputation of our researchers, indicate the reach and impact of our research, and are a key factor in league table positions. Industry and international collaborations further increase our reputation and reach. The metric takes into account discipline differences in citation rates</td>
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<td></td>
<td>% outputs with industry co-authors</td>
<td>Citations of our research publications are linked to the reputation of our researchers, indicate the reach and impact of our research, and are a key factor in league table positions. Industry and international collaborations further increase our reputation and reach. The metric takes into account discipline differences in citation rates</td>
</tr>
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</table>

| Building capacity    | Full time PGR completion rate         | PGR completions reflect the quality of our training environment and community, and are a key route to high quality capacity and capability |
|                      | 5% annual increase in new PGR         | PGR completions reflect the quality of our training environment and community, and are a key route to high quality capacity and capability registrations |