

Strategic Innovation Opportunities for NI

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Prepared by UUEPC for Matrix, February 2021

Introduction

Matrix commissioned this study to explore the links between research excellence and innovation in Northern Ireland.

The aims of this project were to map/identify the following for Northern Ireland:

- Excellence in science and research, highlighting areas of world-class and internationally-competitive capabilities;
- Strengths in innovation activities;
- Science and innovation assets, including institutes & facilities;
- Ability to work collaboratively across the R&D, science and innovation landscape, identifying potential areas for greater collaboration;
- Engagement between the research base and business.

Mapping global priorities

matrix.

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Megatrends

Global challenges and opportunities

Ageing and growing
population



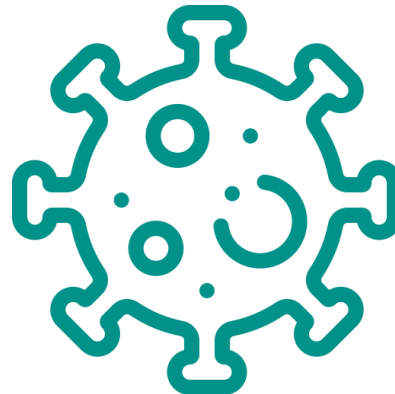
Increased
urbanisation



Climate change



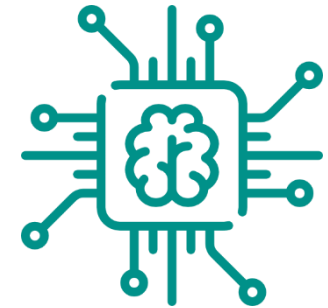
COVID-19



Brexit



The 4th Industrial
Revolution



Shifting global
economic power



Global research trends

Environmental sciences

Deforestation, net-zero carbon, sustainable living



Future tech. & ICT/AI

Robotics, machine learning, behavioural changes



Advanced manufacturing

Robotics, AI, machine learning & data analytics



Skills

Technology in education, digital skills



Creative industries

Digitalisation, well-being



Physical infrastructure

Transport links, people-based solutions



Agri science & food tech.

Food security, technology, diet & nutrition



Health & social sciences

Ageing & growing pop., demographic (female) ageing, technology & data in health, mental health



Excellence in science and research

Highlighting areas of world-class and internationally-competitive capabilities

matrix.

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Top 10 areas in the Research Excellence Framework Overall impact 4*

A broad range of subjects are in NI's Top 10 REF areas.

Top 10 REF subjects for NI for Overall impact 4*, 2014

Rank	Subject	4*
1	Art and Design: History, Practice and Theory	47
=2	Allied health professions, Dentistry, Nursing and Pharmacy: A: Pharmacy	44
=2	Agriculture, Veterinary and Food Sciences	44
=4	Anthropology and Development Studies	42
=4	English Language and Literature	42
6	Law	41.5
7	Modern Languages and Linguistics	40
8	Allied Health Professions, Dentistry, Nursing and Pharmacy: B Biomedical Sciences	39
9	Education	35
10	History	33

Source: REF 2014 are the latest available data

Note: For Law, an average of UU and QUB's 4* percentage was used

Research Excellence Framework: Case Studies

Wide range of subjects covered in subject areas :

Art & Design

- Fairy Magic: Enabling cinematic experiences on mobile devices in real-time.
- Photography and the representation of conflict

Allied Health Professions, Dentistry, Nursing and Pharmacy

- Addressing the Health Inequalities of People with Intellectual Disabilities
- Reduced prescribing of inappropriate medication in nursing home residents through a pharmacy intervention

Agriculture, Veterinary and Food Science

- Protecting the Integrity of the Global Feed-Food Supply Chain: Detecting and Preventing Chemical Contamination
- Solving the Bangladeshi Crisis of Nitrofurantoin Antibiotic Contamination in Shrimps

Education

- ICT for intercultural school links: the Dissolving Boundaries Programme
- Promoting Respect for Ethnic Diversity in Preschool Children

Modern Languages and Linguistics

- Embedding computer-assisted language learning (CALL) in Modern Foreign Languages curricula, in industry and in the community
- Language Policy and Planning in Northern Ireland

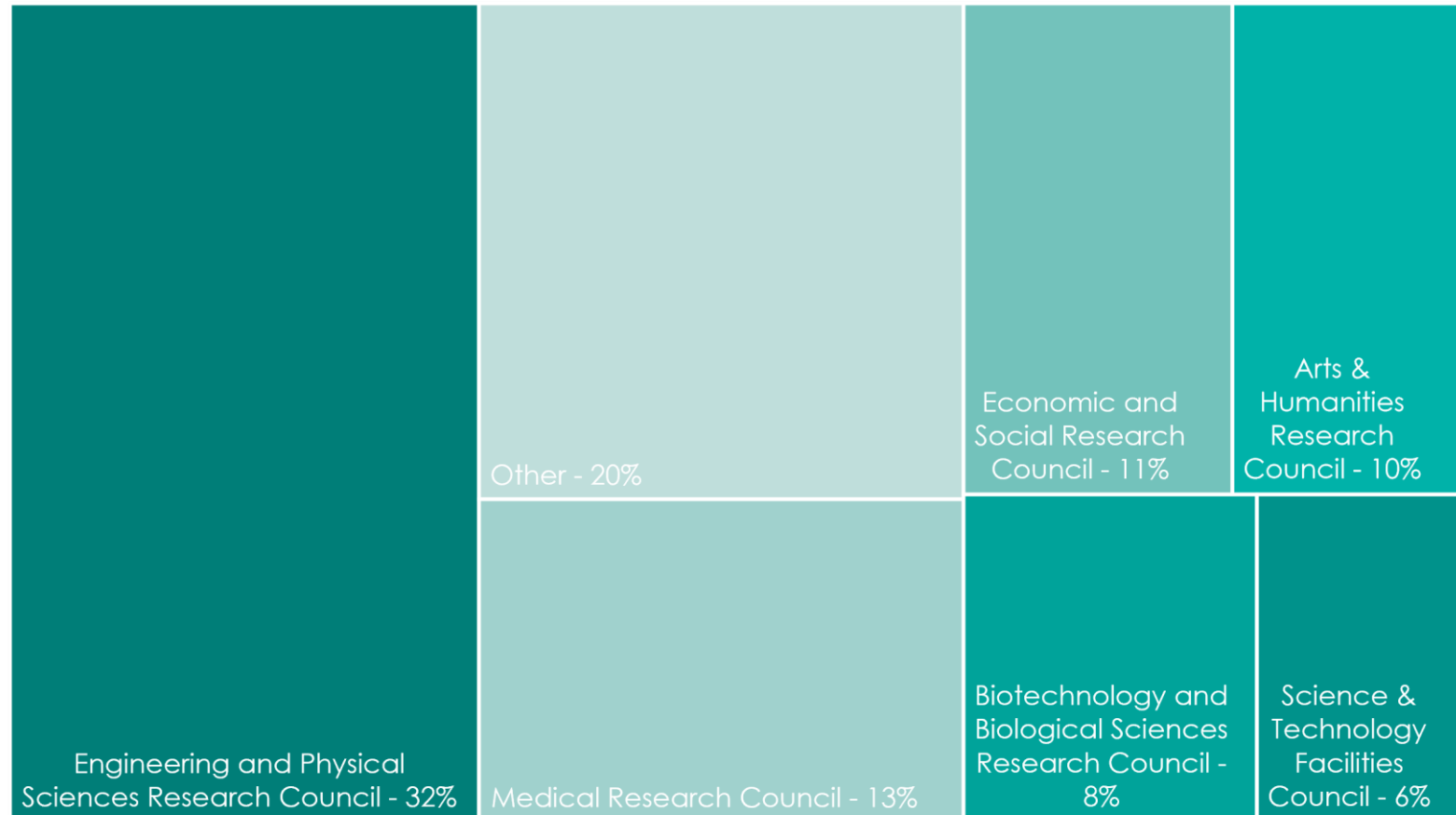
Citation impact 2015-19

Subject areas with high levels of citation of outputs published from research institutions in NI

- The strong performance by UU and QUB as well as Health Care Trusts and AFBI.
- Data supports that areas of strength for NI are:
 - **Art & Design** within this: Engineering.
 - **Medicine, Pharmacy and Biosciences** within this: Pharmacology, Toxicology and Pharmaceuticals; Medicine; Health Professions; Immunology and Microbiology and Biochemistry; and Genetics and Molecular Biology.
 - **Engineering and Manufacturing** within this: Engineering and Environmental Science.
 - **Materials and Manufacturing** within this: Materials Science.
 - **Agriculture** within this: Agriculture and Biological Sciences.
 - **AI** within this: Computer Science; Mathematics and Engineering.

Research council funding in NI

Research grants and contracts - by research council, NI, %, 2018/19

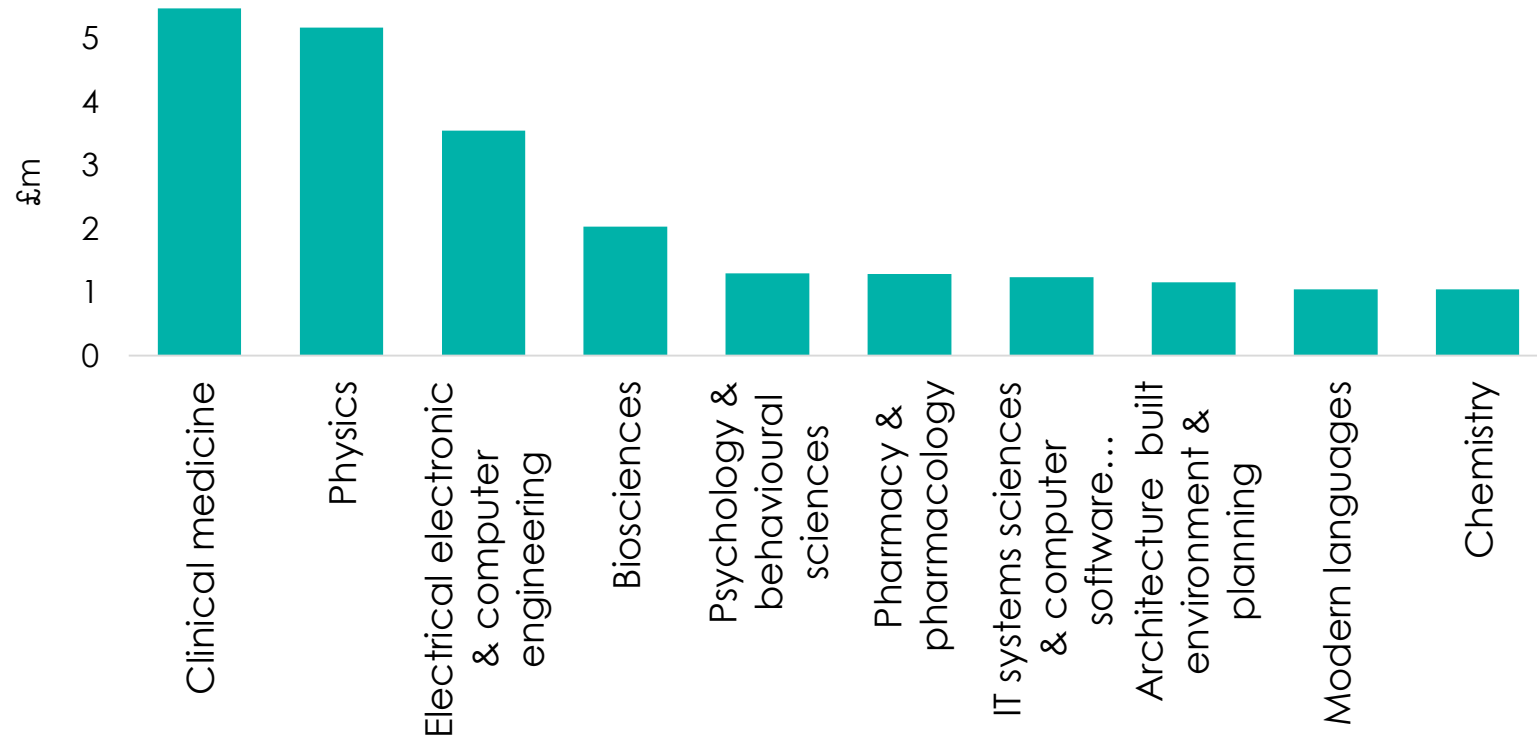


- In 2018/19 research councils in NI received £31.4m in funding.
- Overall in 2018/19, Engineering and Physical Sciences Research Council received a third of funding, followed by 'Other' and then the Medical Research Council.

Source: HESA

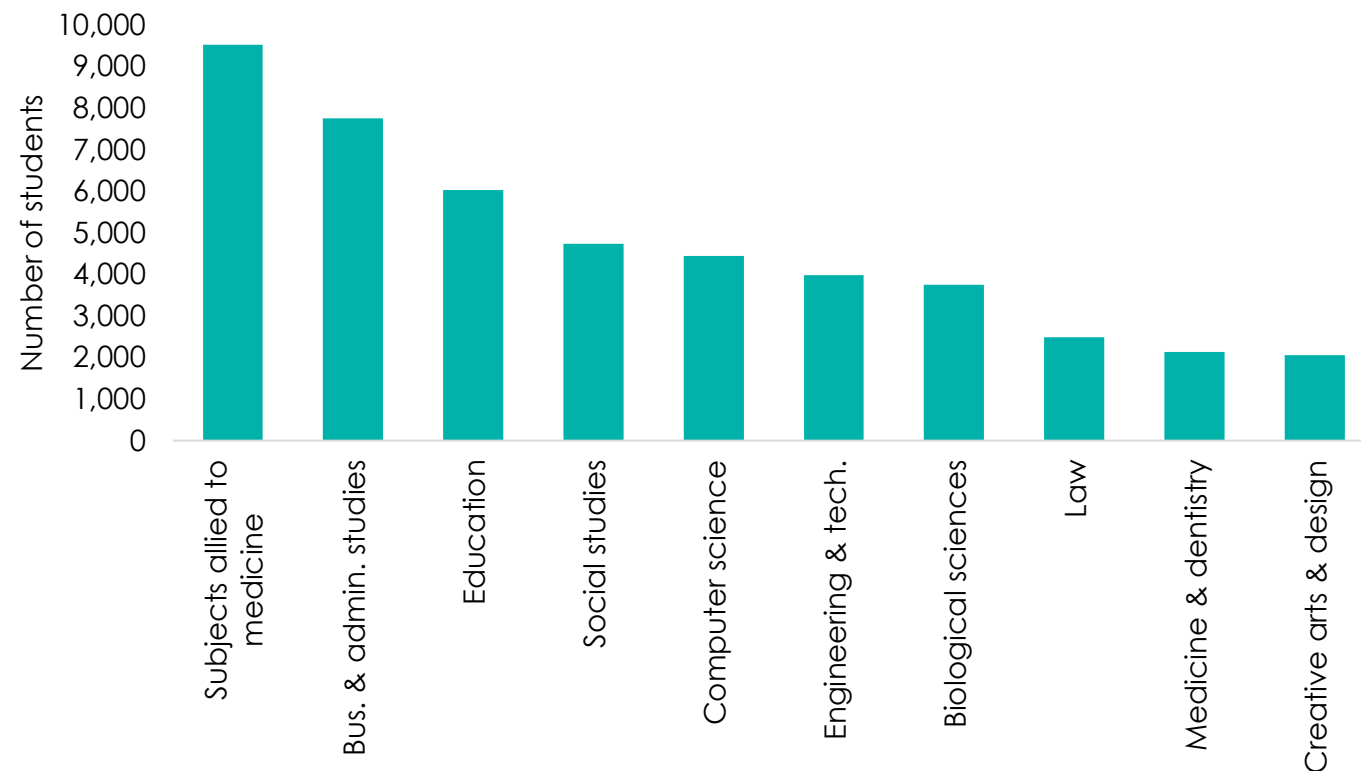
Top 10 funded cost centres and top 10 studied subjects

Top 10 funded cost centres from total research council funding, NI, £m, 2018/19



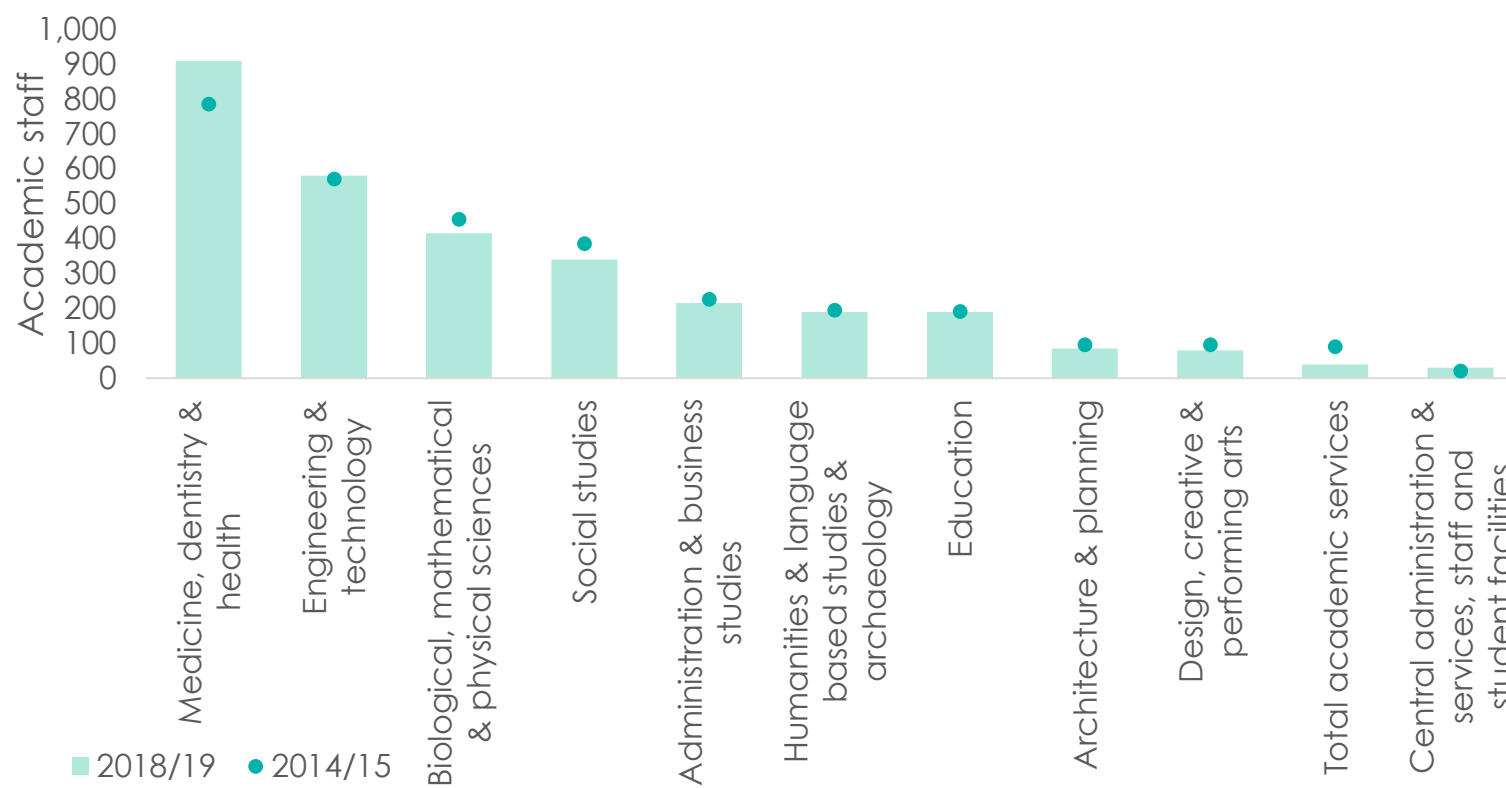
Top 10 funded cost centres and top 10 studied subjects

**Top 10 subjects
studied at NI
Higher Education
Institutions, 2018/19**



Higher Education academic staff in NI

FTE academic staff (excluding atypical) by cost centre, NI, 2014-2019

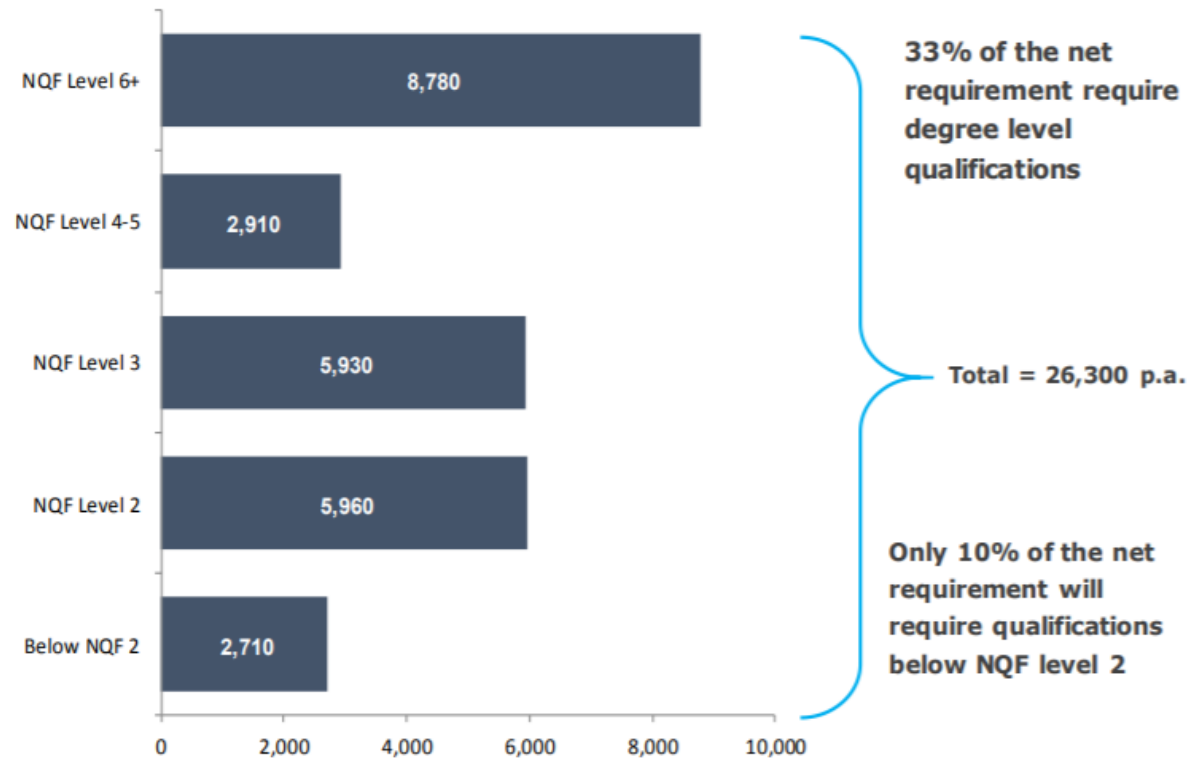


In 2018/19 there were 910 academic staff in Medicine, dentistry & health, a significant increase from 785 in 2014/15.

NI Skills Barometer

What skills are in demand in NI?

Average annual net requirement for skills, 2018-2028



Science and technology professionals are forecast to provide the most job opportunities over the next decade requiring 2,070 people from outside the existing labour market.

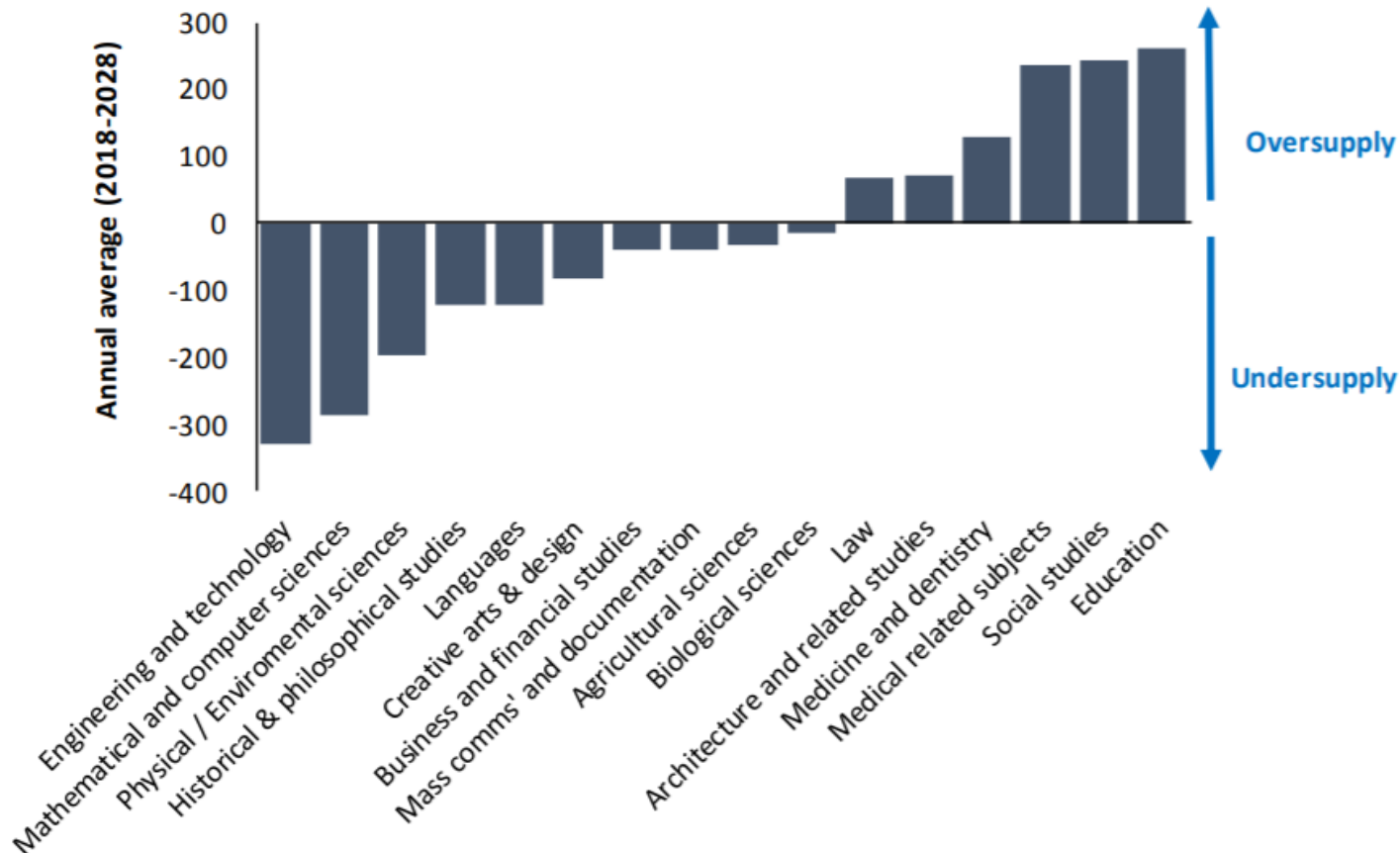
A reduction in demand within occupations which traditionally require lower levels of formal qualification (e.g. sales occupations, secretarial and related occupations, elementary trades etc.) was forecast and evidence suggests that these trends have been accelerated by COVID-19 during 2020.

Source: UUEPC

NI Skills Barometer

Strong demand for STEM subjects

Annual average effective supply gap by NQF level 6+ subject (JACS, 1-digit), 2018-2028



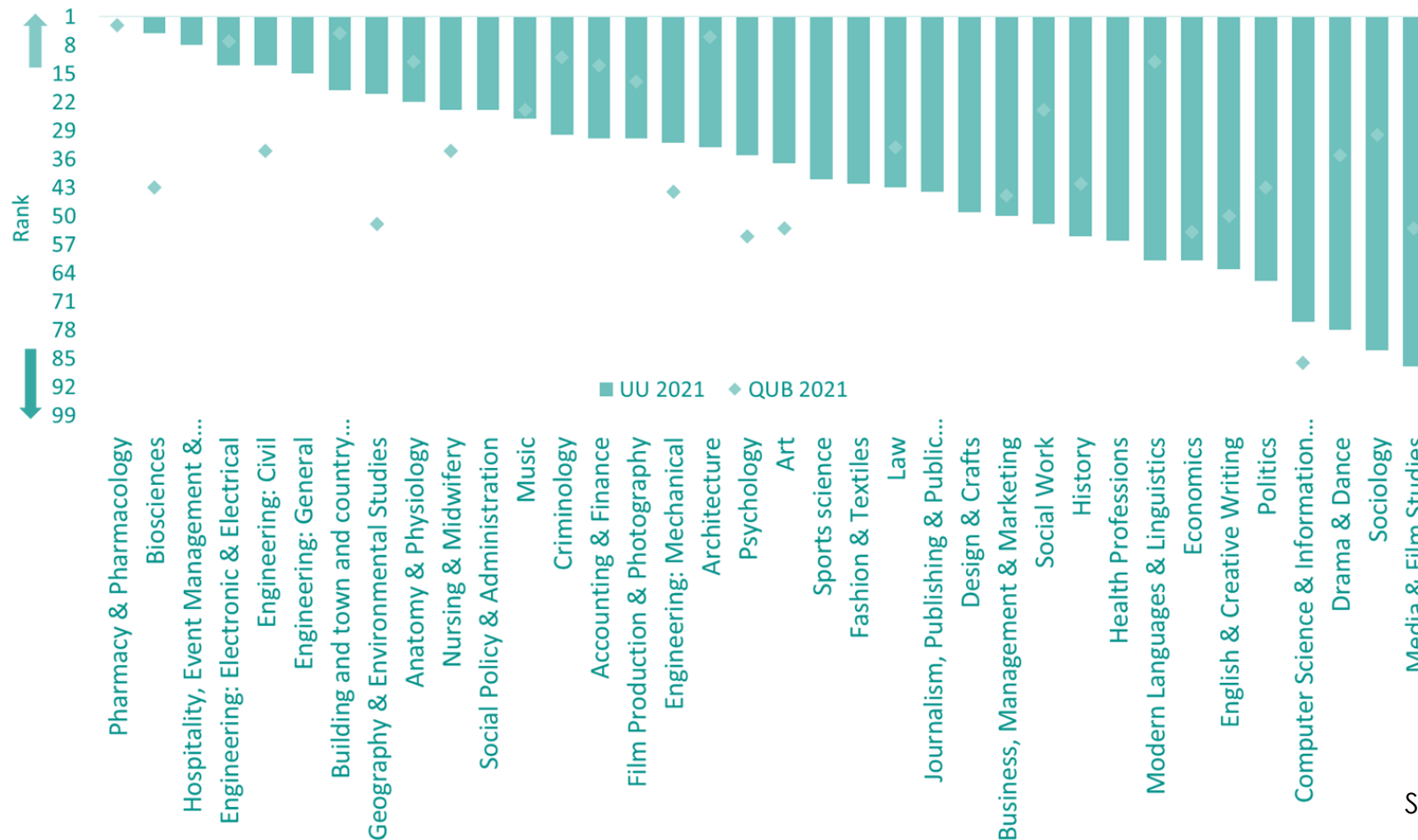
- The pre-COVID-19 NI Skills Barometer suggests that subjects forecast to be **under-supplied** are:
 - **Engineering and technology;**
 - **Maths and computer sciences;**
 - **Physical and environmental sciences.**
- This reflects the **growth in the ICT, professional services and advanced manufacturing sectors** in the high growth scenario driving demand for qualifications in computer science and engineering subjects. Evidence suggests that COVID-19 has exacerbated these pre-existing trends.

Source: HESA & UUEPC

The Guardian University Guide

QUB and UU top ranked subjects

The Guardian University Guide, Ranks 2021, QUB and UU



Subjects at QUB in the Top 10:

- Pharmacy & Pharmacology 3rd
- Building and town and country planning 5th
- Engineering: Electronic & Electrical 7th

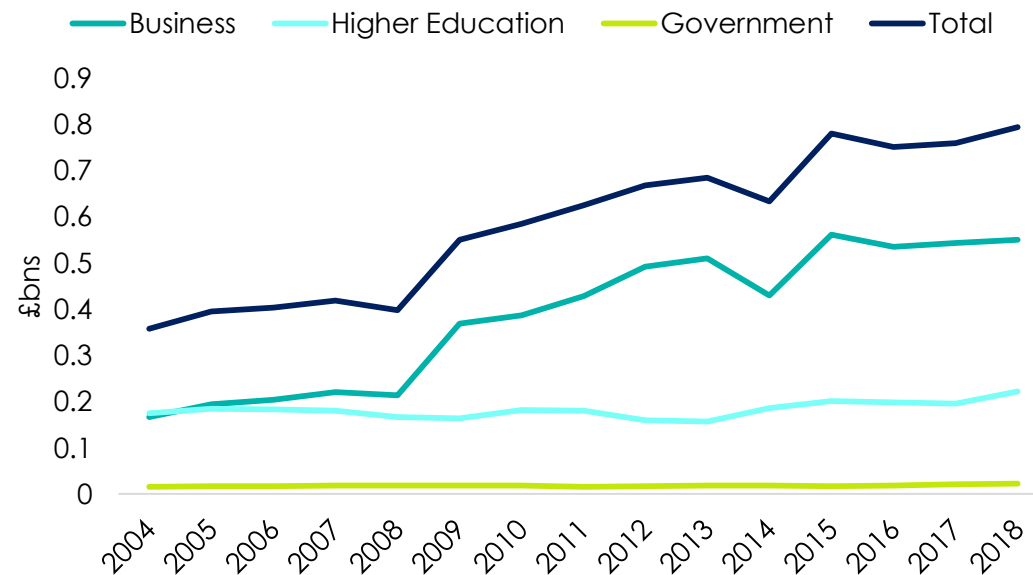
Subjects at UU in the Top 10:

- Pharmacy & Pharmacology 1st
- Biosciences 5th
- Hospitality, Event Management & Tourism 8th

Source: The Guardian University Guide

R&D spending

Expenditure on BERD, HERD, GERD and Total R&D, NI, 2004-2018

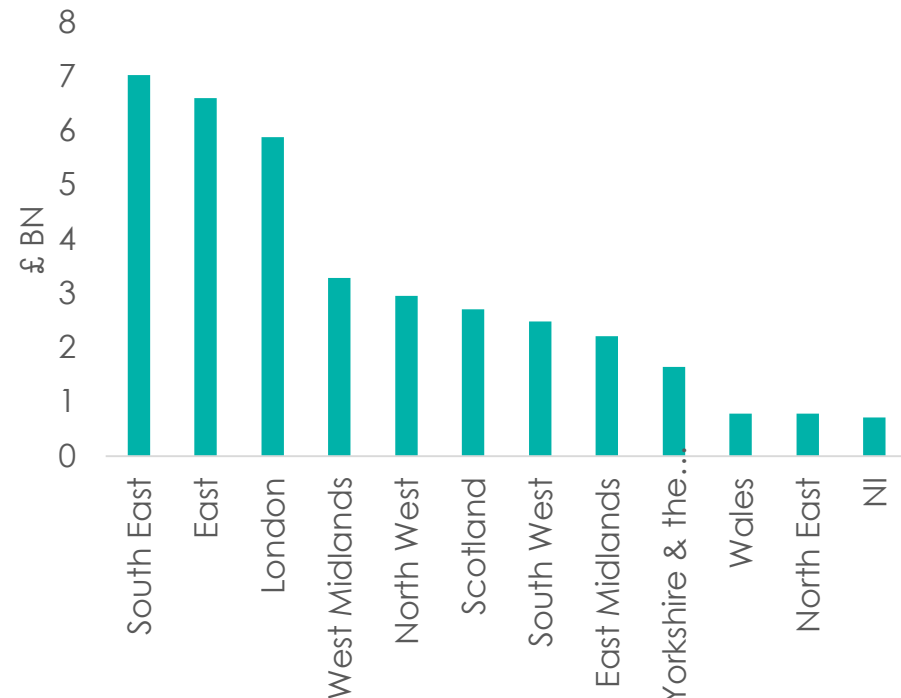


- In NI, £0.8bn in total was spent on R&D during 2018.
- Business expenditure grew from £0.2bn in 2004, to £0.5bn 2018.
- HE spending on R&D remained constant at £0.2bn in 2018.
- Government spending also remained very low and constant at £0.02bn.

Source: NISRA

Total spending on R&D by UK regions

Total regional expenditure on R&D in the UK, 2018



Source: ONS

- NI spends the least on R&D of the UK regions (£0.8bn).
- The South Eastern corner of England accounts for £7bn of R&D expenditure (19% of total).

Summary of excellence in science and research

Subject strengths:

- Pharmacy (1st UU, 3rd QUB, REF, global growth, citation)
- Medicine (staffing, students, REF, cost centre funding, global growth, citation, labour supply)
- Art & Design (No. 1 REF, global growth, citation)
- Biosciences (5th UU, staffing, global growth, citation)
- Electrical- Electronic Engineering (7th QUB, staffing, cost centre funding, global growth, citation)
- Education (students, labour supply, REF)
- AI, computer sciences & digitisation (within larger subject areas, citation)
- Agriculture, Veterinary and Food Science (REF)

Note: Rankings from Guardian University Guide

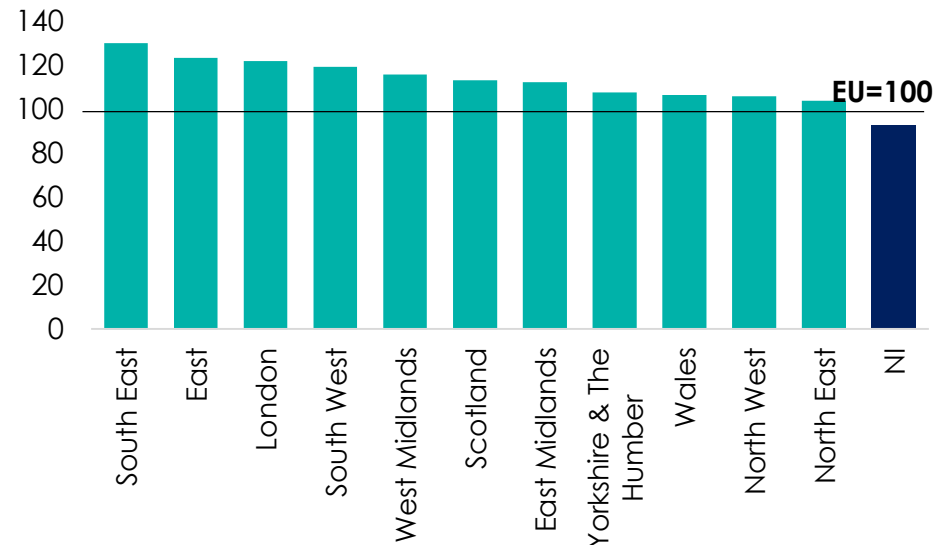
Strengths in innovation activities

matrix.

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European Regional Innovation Scoreboard

Regional Innovation Scoreboard, UK regions relative to the EU, 2019

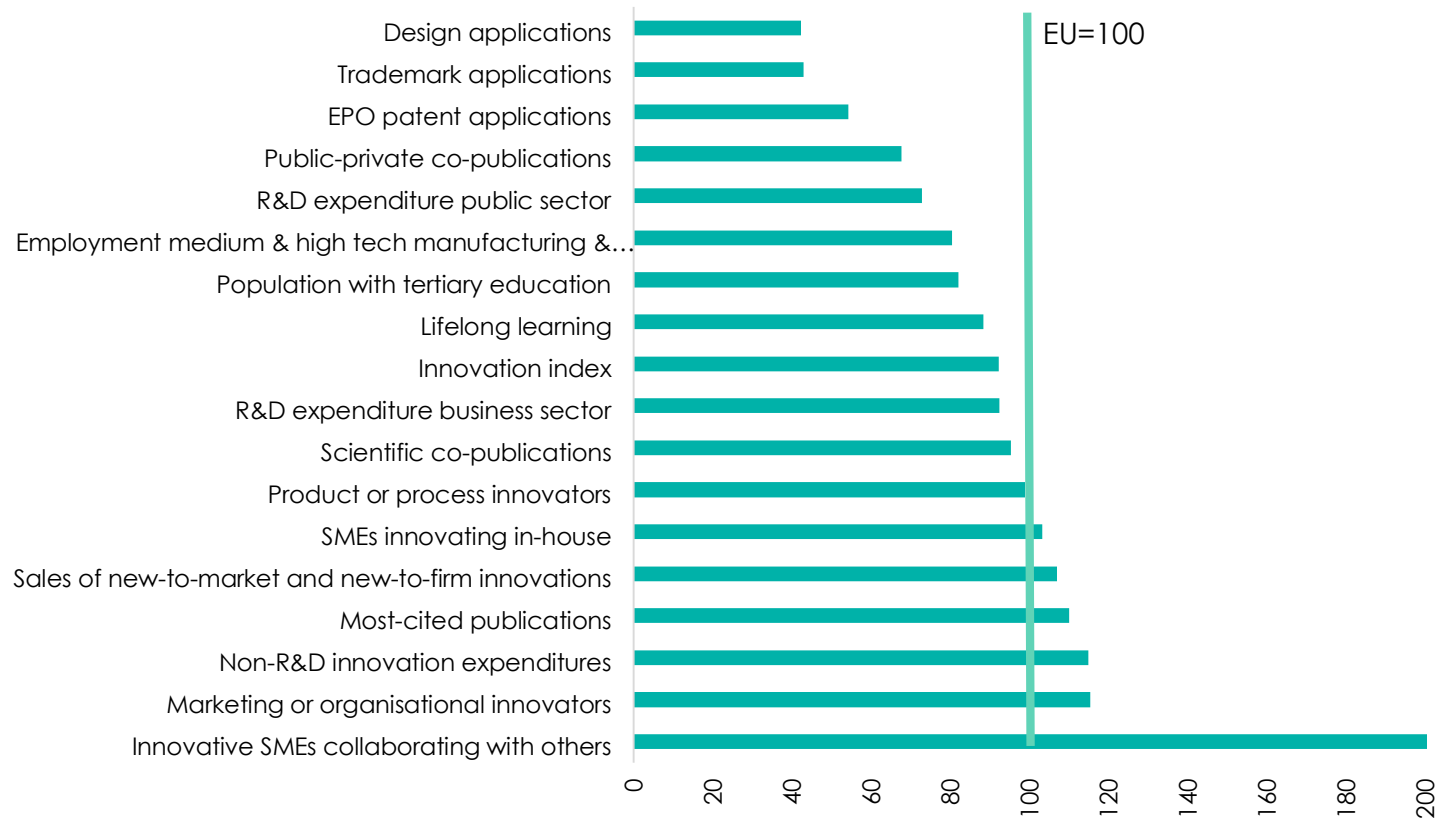


- In the European Innovation Scoreboard NI returns a below average performance for the EU regions during 2019.
- When compared to the other UK regions, NI's innovation performance remains weak.

Source: European Commission

European Regional Innovation Scoreboard

Northern Ireland Profile in 2019 compared with the EU (100)



NI performs well in:

- Innovative SMEs collaborating with others;
- Marketing or organisational innovators;
- Non-R&D innovation expenditures;
- Most-cited publications;
- Sales of new-to-market and new-to-firm innovators; and
- SMEs innovating in-house.

NI could improve in:

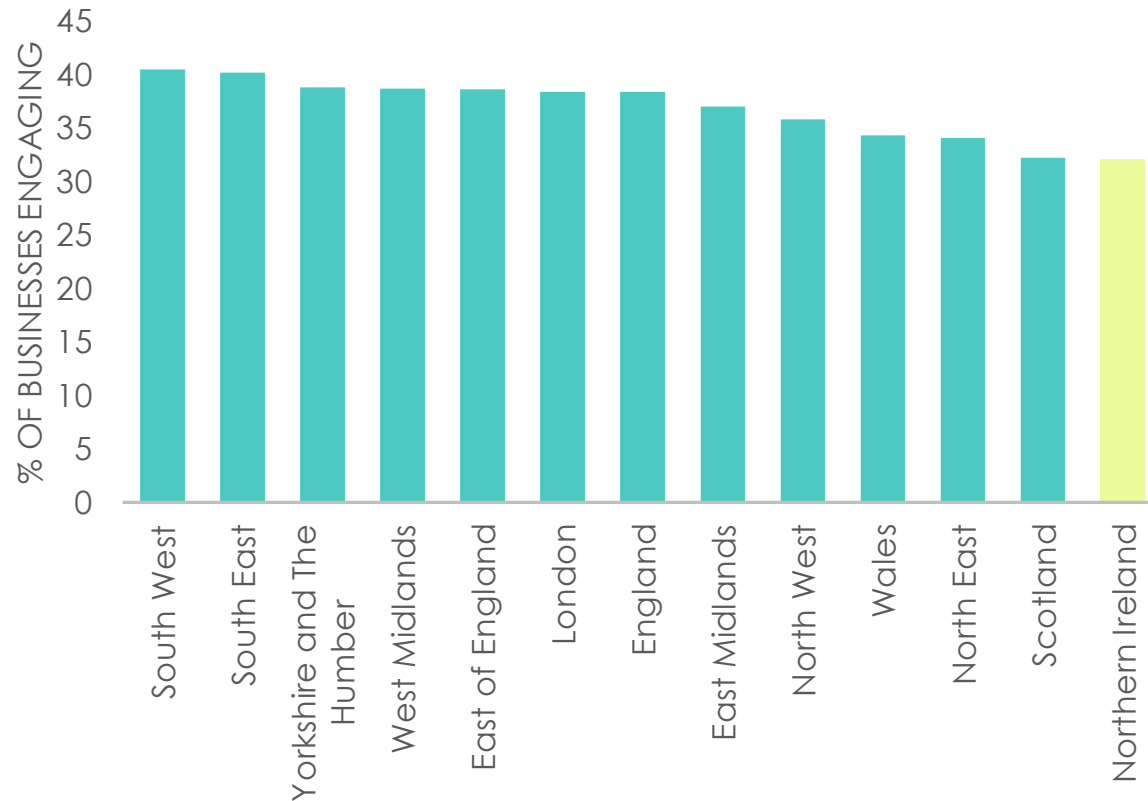
- Design, trademark and patent applications;
- Public-private co-publications; and
- R&D expenditure public sector.

Source: European Commission

UK Innovation Survey

Innovation active firms

Percentage of businesses that are 'innovation active' by UK region, 2016-2018



- In NI, just under a third of firms are innovation active, the lowest of the UK regions.

Source: UK Innovation Survey

UK Innovation Survey

Innovation active firms



- The top three UK sectors are:
 - Research & experimental development on social sciences & humanities
 - Computer & related activities/ICT
 - Manufacture of electrical & optical equipment
- Unfortunately, no data for NI are available breaking down innovation activity by sector.

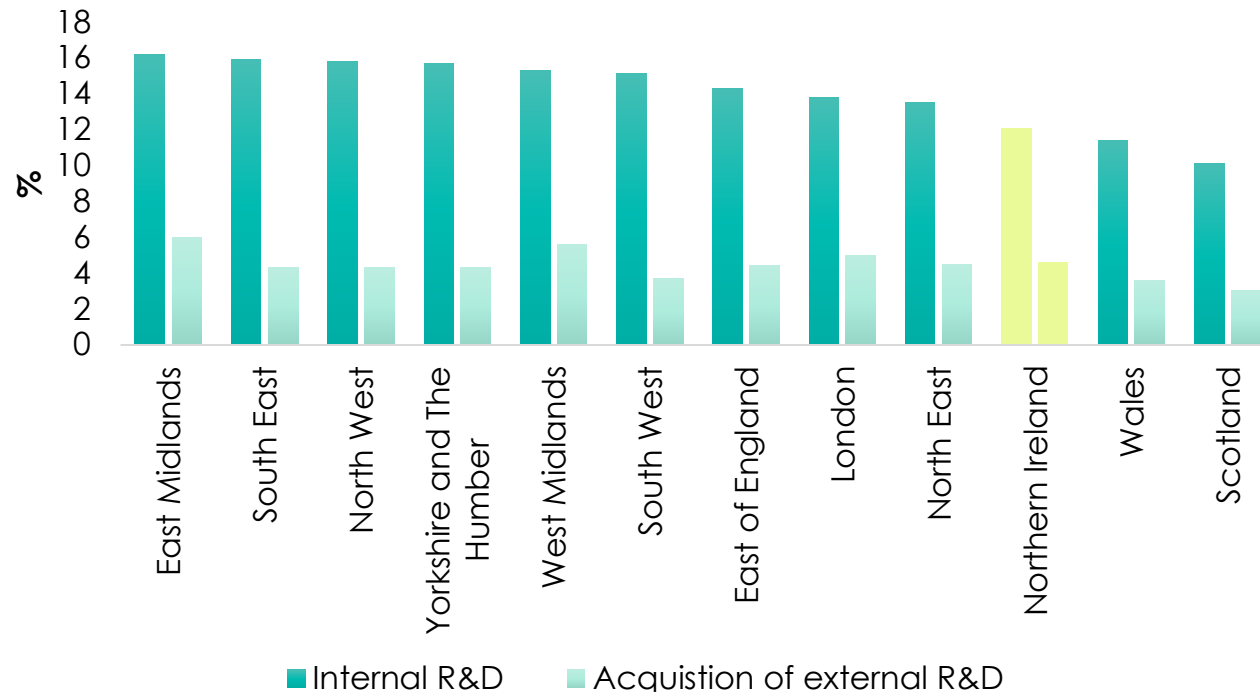
Source: UK Innovation Survey

matrix.

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Innovation activity in NI – R&D

Innovation activity, internal R&D and acquisition of external R&D, UK regions, 2016-18

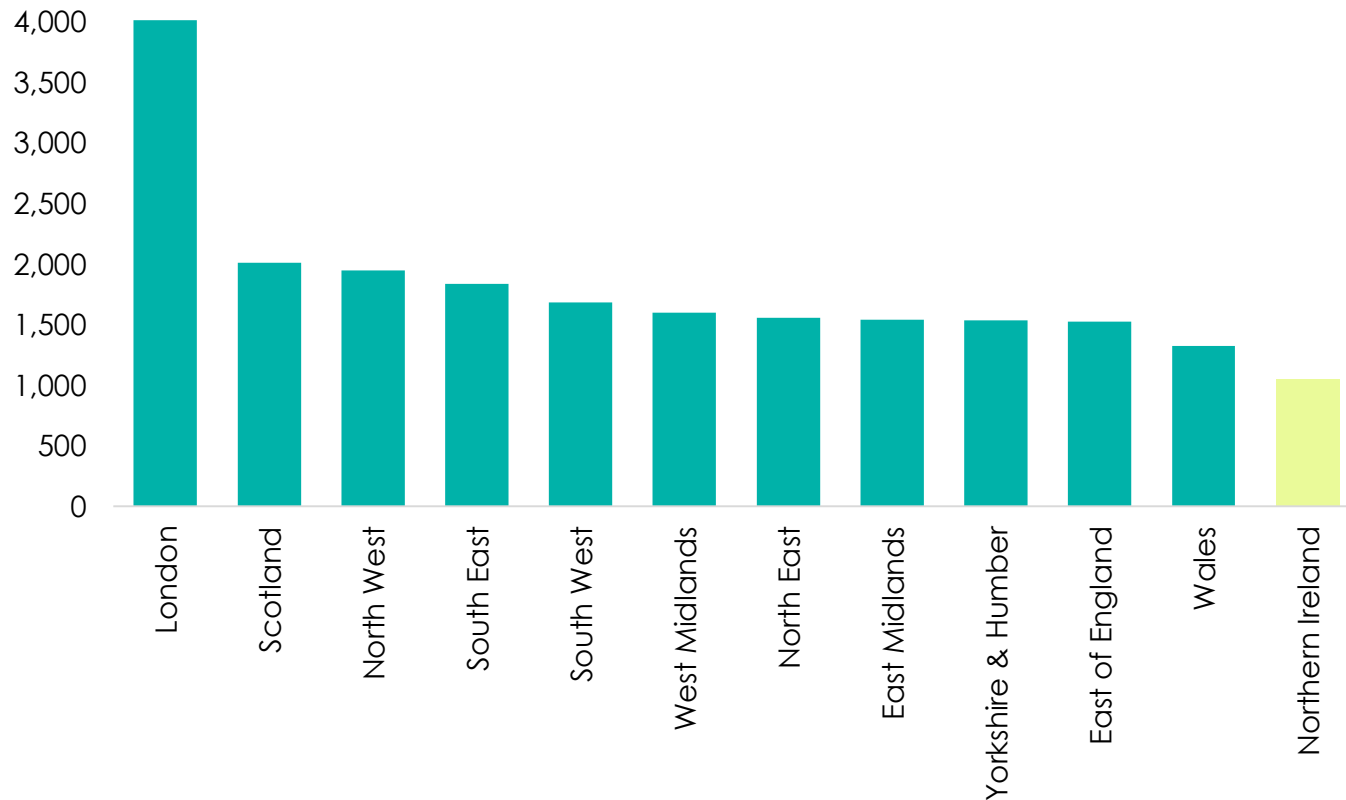


- In terms of the innovation activity taking place in NI, 12% of innovation activity was in the form of internal R&D, NI performs ahead of Wales and Scotland for internal R&D.
- In NI 5% of firms acquired external R&D as part of their innovation activity.
- Additionally in NI as part of their innovation activity:
 - 7% of firms acquired advanced machinery;
 - 9% of firms acquired computer hardware;
 - 14% of firms purchased computer software; and
 - 9% carried out training for innovation activities.

Source: Intellectual Property Office

Signs on innovation – Trademarks

Trademarks registered per 100,000 businesses, UK regions, 2019

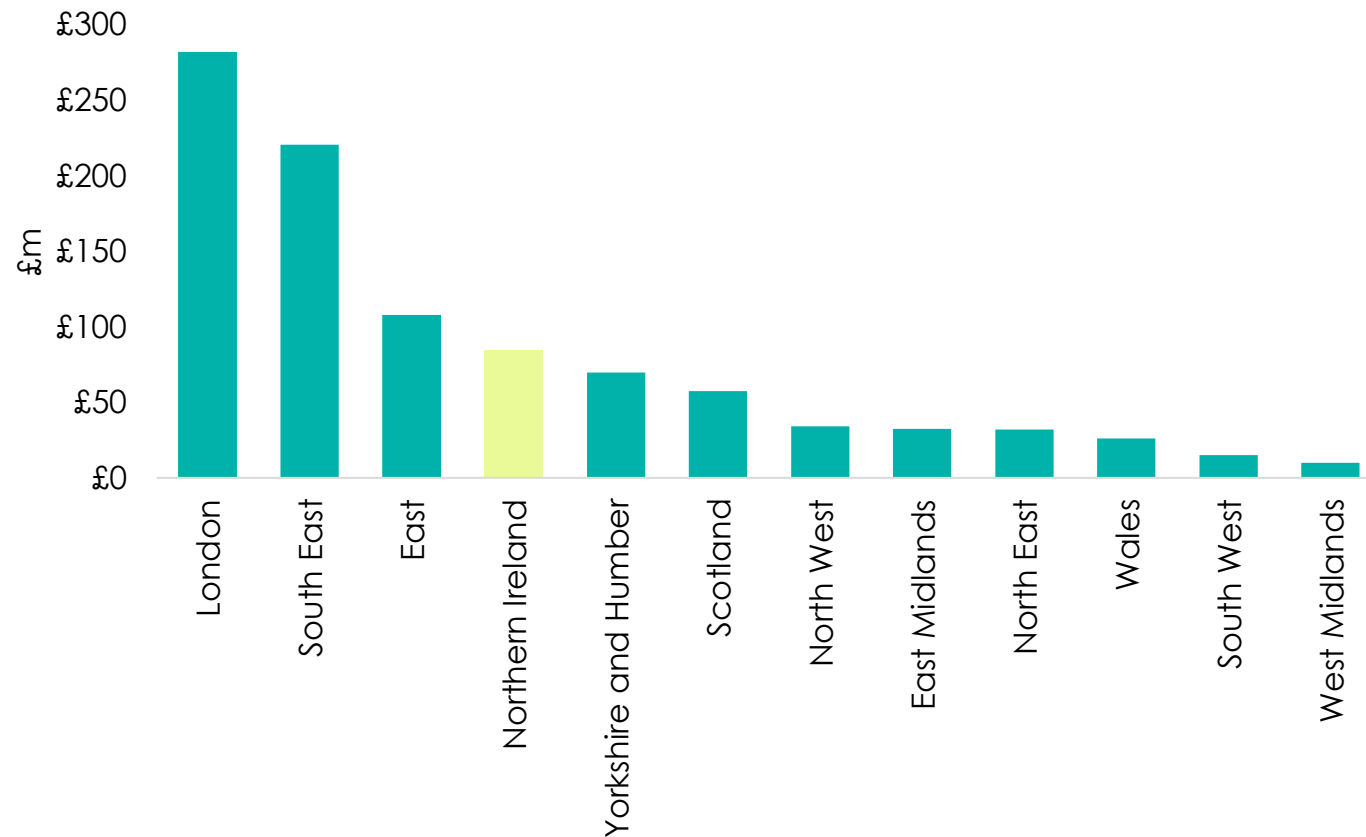


- In 2019, there were 1,051 trademarks registered in NI per 100,000 businesses, the lowest of the UK regions.
- In comparison in London 4,000 trademarks per 100,000 businesses registered.
- NI ranked 10th out of the 12 UK regions in patents granted per 100,000 businesses.

Value of IP revenue by Universities

QUB and UU in the top 30

5-year total of IP revenue by UK Universities by regions , 2014-2019, £bn

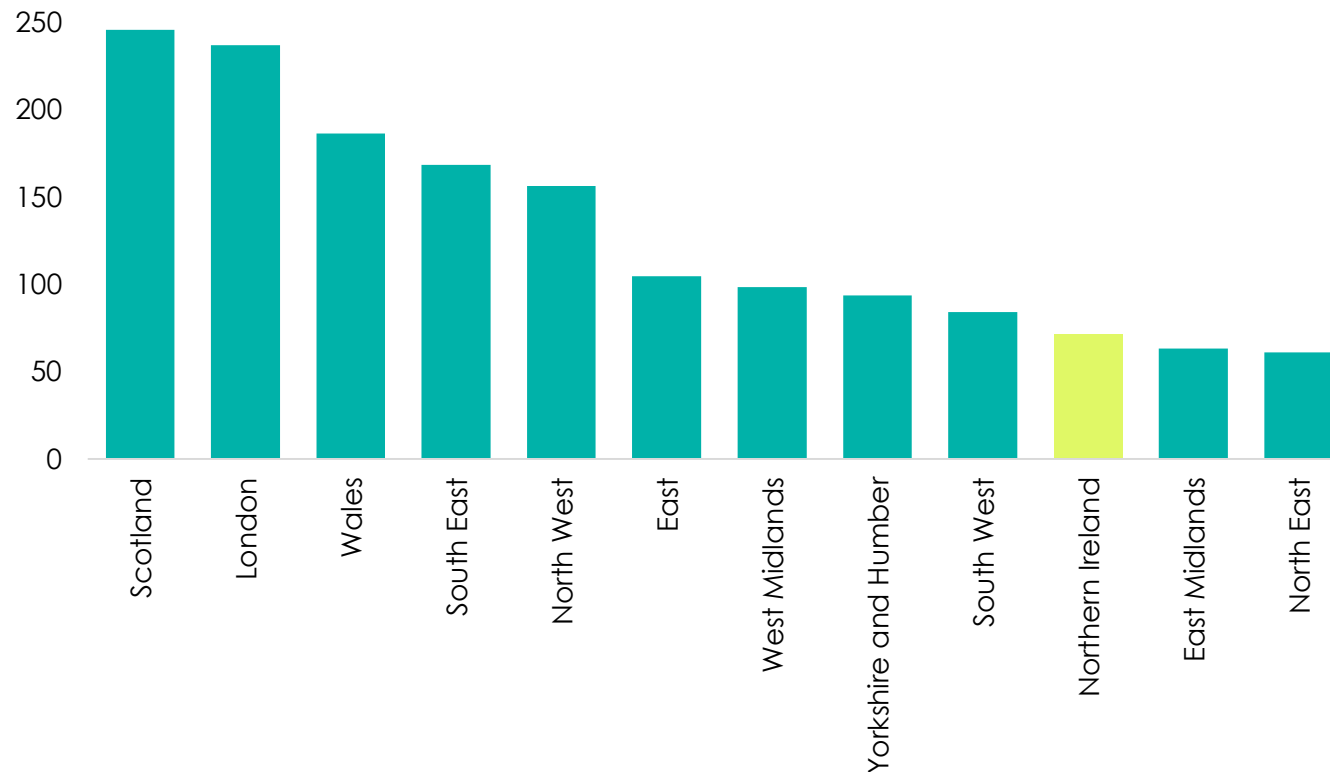


- Intellectual property (IP) includes patents, copyrights, design registrations and trademarks.
- IP is a key indicator illustrating for measuring knowledge generation.
- QUB IP revenue totaled £81m between 2014-2019, 4th of the UK universities.
- UU IP revenue totaled to £3m (2014-2019), putting them in the top 30 of 166 Universities across the UK.

University Spin-offs

Spin-offs are companies set-up to commercialise IP generated within universities

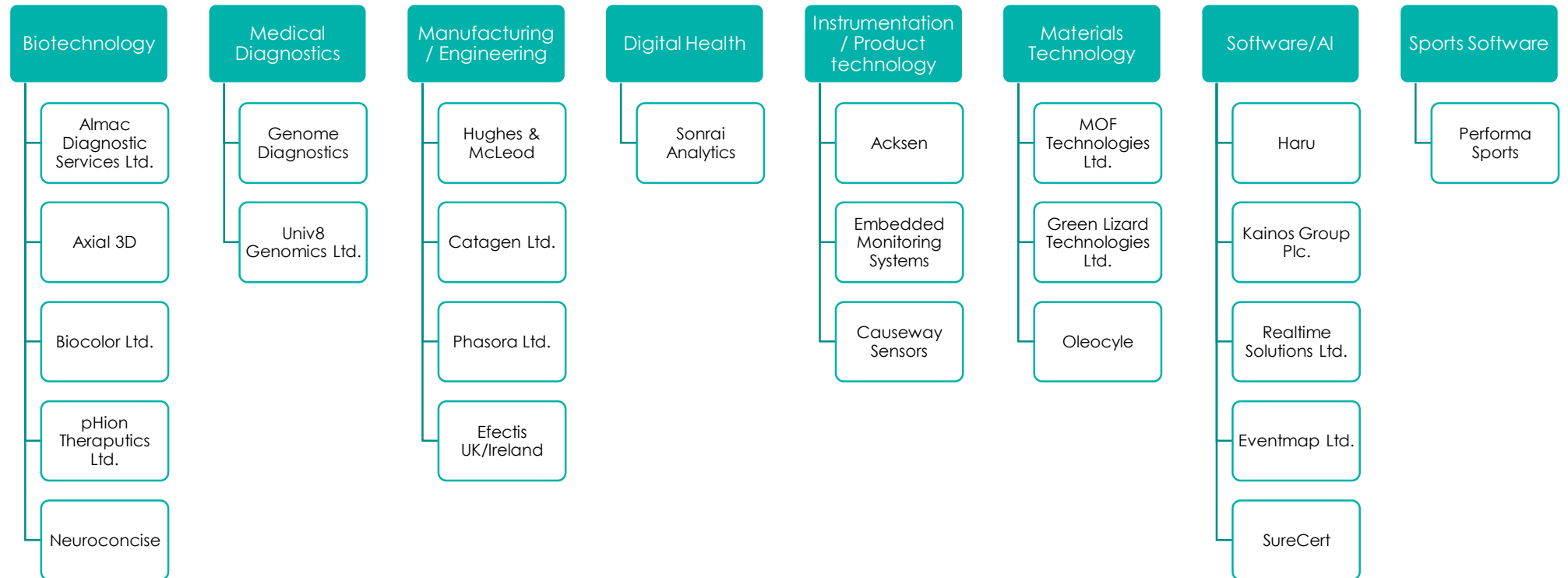
Average number of active spin-offs per year by UK Universities by region, 2014-15 to 2018-19



- From 2014 - 2019, QUB generated an annual average of 49 active spin-offs, a strong performance, ranking them 8th of the UK universities.
- UU averaged 22 spin-offs annually, ranking them in 23rd out of 166 UK Universities.

QUB and UU Spin-offs

Wide range of example spin-offs from QUB and UU highlighting research and innovation across a range of areas



Source: QUB & UU
Note: lists are not exhaustive

Summary of strengths in innovation activities

- This section highlights that NI's overall performance in innovation activity is below average, both in comparison to EU and other UK regions.
- Northern Ireland performs well in terms of IP generated and commercialised through spin-out companies, with the majority generated by Queen's University.
- The top three innovation active sectors in the UK are also areas that match research strengths in NI. These sectors are:
 - **Research & experimental development on social sciences & humanities**
 - **Computer & related activities/ICT**
 - **Manufacturing of electrical & optical equipment**

Science and innovation assets, including institutes & facilities

matrix.

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NI research facilities

NI has multiple leading edge research centres across a variety of subjects & sectors

Advanced Future Materials and Manufacturing Centre

- Strength in places - Belfast Maritime Consortium help to build zero emission ferries (13 partner syndicate including Belfast Harbour and Bombardier).

Institute For Global Food Security

- An institute which focuses on researching the integrity of food supply chains, the future of agriculture, and the challenges involved in feeding a growing population

Sport in Society Research Centre

- Sport and Health- examination of the ways in which social relations mediate all aspects of the sport-health nexus in non-elite to elite sport

The Institute of Electronics, Communications and Information Technology (ECIT)

- A research institute focused on making the changing global digital space both safer and faster. Future Series: Cybersecurity, emerging technology and systemic risk report–contribution to World Economic Forum report

United Nations Educational, Scientific and Cultural Organisation (UNESCO Centre)

- A Review of the Policy Area Affecting Integration of the Education System in Northern Ireland (2015)

Precision Medicine Centre of Excellence

- Collaboration with Roche and Sonrai Analytics to develop AI to detect cancer earlier and aid more accurate diagnoses.

NI Competence Centres

Supporting collaboration, research and innovation

NI has four active Competence Centres:

1. **Connected Health Innovation Centre (CHIC - hosted by UU)**
2. **The Centre for Advanced Sustainable Energy**
3. **The Northern Ireland Advanced Composites and Engineering Centre (NIACE)**
4. **Agri-Food Quest**

These offer companies an opportunity to **develop new products, processes and services and bring them more quickly to global markets.**

Membership is open to any company in NI, or internationally, that wants to collaborate in applied research with high levels of funding support provided by Invest NI.

Case study:

CHIC researchers in partnership with Intelesens Ltd, CIGA Healthcare and Randox with support from Invest NI's Competence Centre programme, worked to develop a mobile device capable of diagnosing and interpreting 15 common medical conditions including, anaemia, hypertension, stroke, sleep apnoea, pneumonia and HIV. It includes a symptom checker which uses complex algorithms based on 53 symptoms to detect disease.

Source: Invest NI

**Engagement between the research base and
business
&
ability to work collaboratively across the
R&D, science and innovation landscape,
identifying potential areas for greater
collaboration**

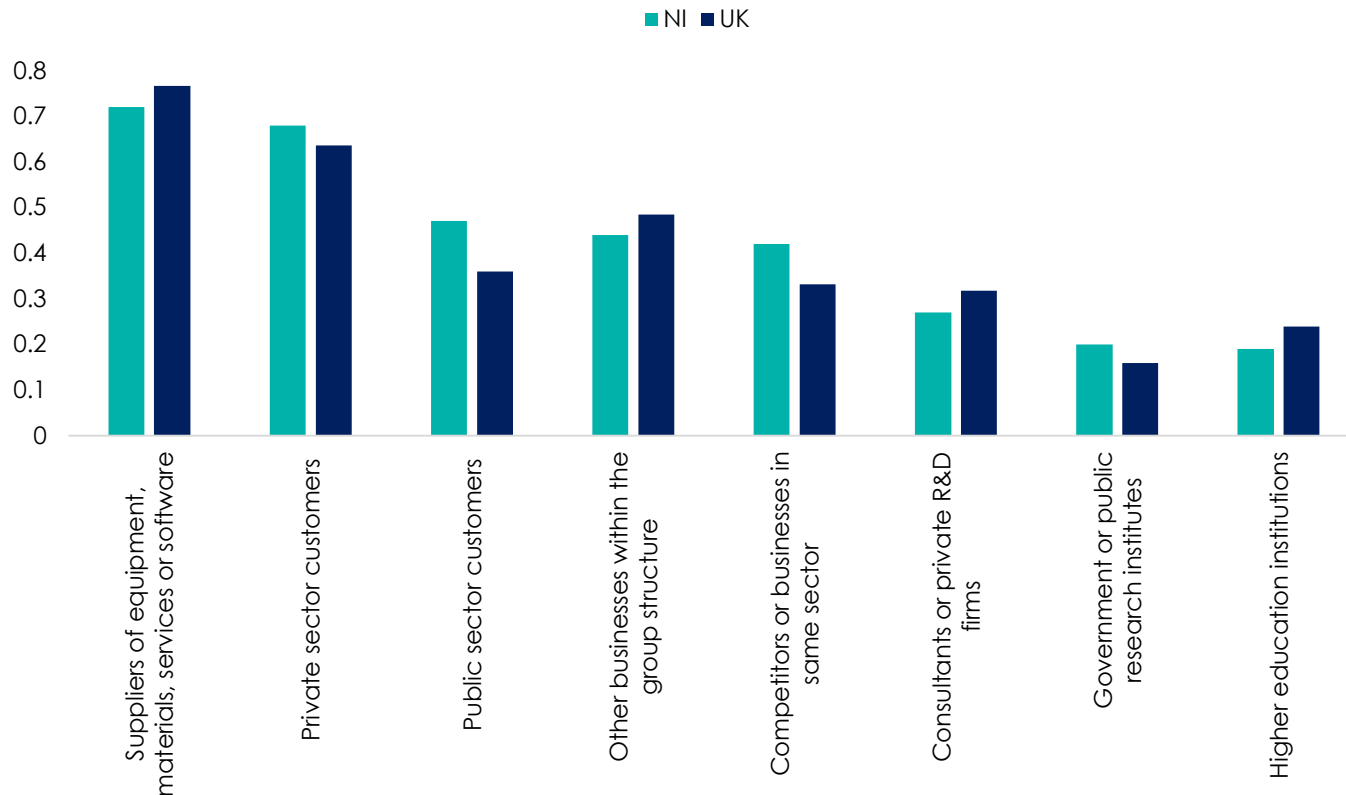
matrix.

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Collaboration and innovation

UK Innovation Survey

Collaboration arrangements (of broader innovator businesses with any collaboration arrangements), UK and NI, 2016-18



- In NI and the UK, innovation collaboration is strongest with suppliers and private and public sector customers.
- In NI, collaboration is lowest within Higher Education institutions whilst in the UK it is with Government or public research institutes.

Source: UK Innovation Survey

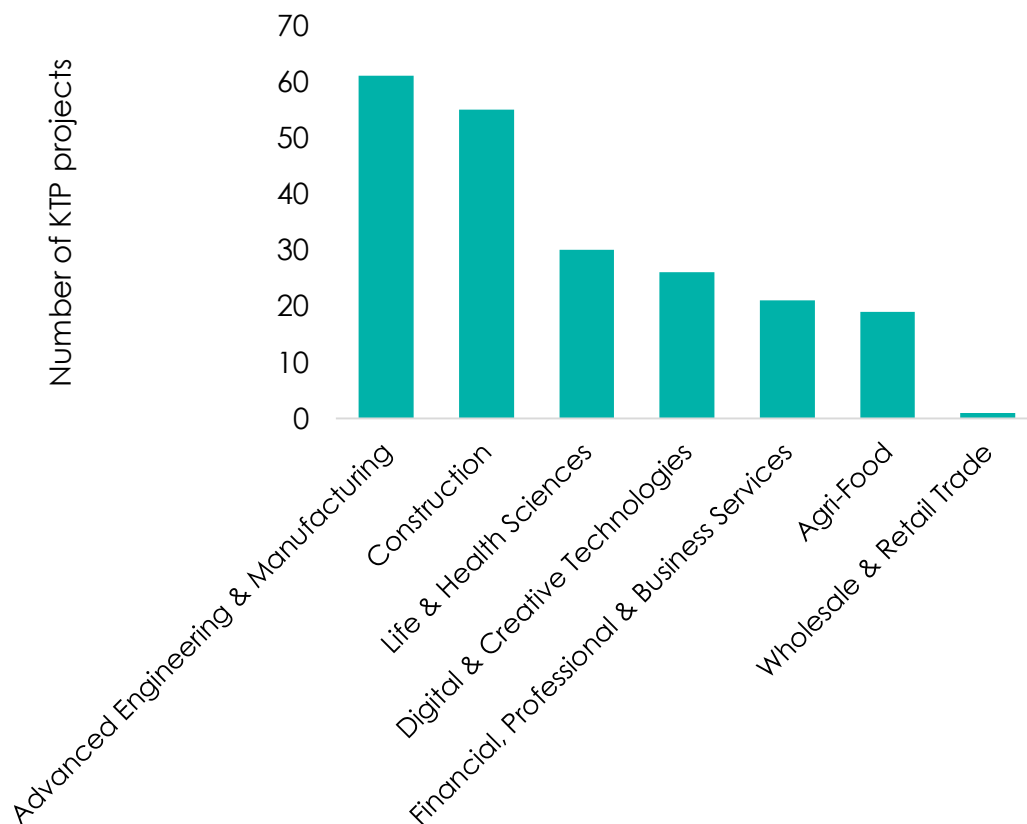
matrix.

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Knowledge Transfer Partnerships 2016-2020

Supporting businesses to access knowledge, technology and/ or skills that reside within the UK's knowledge base

KTP by sector, NI, 2011-2020



- In NI, KTPs have been active since 1985, supporting 418 projects.
- £7.9m* has been spent on KTPs in NI from 2012 to 2020 (roughly £1m per annum).
- KTPs are a part funded grant, companies contribute an amount based on their size. A review conducted by Cogent in 2016 found that 88% of the grants between 2010-2014 awarded to KTP Partnerships were between £50,000 and £100,000.
- Since 2011 there were 213 KTP projects of which Advanced Engineering & Manufacturing accounted for 61 projects (29%), followed by Construction (26%).

Source: Invest NI & Cogent

Note: This figure includes the management fee and grants

matrix.

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KTP Achievements

KTP leads to closer industry partnerships

Knowledge Base Actual Achievements from Participation, Warwick Economics and Development Survey

Outcomes	Achieved
Closer industry partnerships	82%
Better understanding of industry	69%
Enhancing the impact of research	60%
Research publications	60%
Improved teaching material	56%
Improvement in staff skills	44%
New research projects	42%
Contribution to research strategy	33%
High quality research	27%
Enrichment of staff – talent attraction	22%
Attracting students to courses	9%

Source: WECED KTP Survey, 2015

KTP Case Studies

Variety of work in NI that KTPs support

FP McCann

- A pre-cast manufacturer worked with KTP to develop a new system to manage the flow of storm water, their partnership provided outside knowledge and expertise which allowed them to develop products that they have turned in commercial opportunities through sales.
- FP McCann have kept the KTP associates on to continue working with them.

(Source: Invest NI)

Ashton Community Trust

- A social regeneration charity, currently working with a KTP associate from QUB who has supported Ashton on various projects including creating the procurement toolkit and developing more effective social value metrics as well as working with management on new contractual opportunities and preparing bids.

(Source: QUB)

Benefits of KTP across the UK

(Warwick Economics & Development- KTP evaluation)

Benefits include:

- 2001/2 - 2007/8 participating businesses across the UK generated £1.6-£1.8bn of GVA, £0.3bn has been generated through participation of KTP Associates bringing the total net additional impacts to £1.97 - £2.1bn for the UK;
- Non-KTP participating businesses generated an additional net direct and indirect contribution of £0.9bn between 1984-2014;
- Business-based training for associates and business-relevant training and research undertaken by knowledge base institutions; and,
- Better understanding and interaction between businesses and academic institutions, and increased awareness of the contribution academia can make to business development and growth

Proof of Concept Programme

Proving new ideas

Launched by Invest NI to support the pre-commercialisation of leading-edge technologies emerging from Northern Ireland's Research Organisations.

Since 2008, Invest NI have supported 195 business through the Proof of Concept programme, supporting 126 projects within QUB, 64 in UU and 5 in the Agri-Food and Biosciences Institute. Over this period the average total assistance awarded was £101,563.

Project examples include:

- Personalised Medicine in Breast Cancer
- 3D woven composites for Aerospace, Automotive and Marine Applications
- Control of diseases in pigs that may be associated with porcine bocaviruses
- A Portable Biosensor for detecting salicylic acid in crop plants
- Development of a multimarker diagnostic tool for heart failure
- Improved melt processing of PVC

Source: SQW, 2018 & Invest NI
Note: list is not exhaustive

There was a pilot programme starting in 2003, figures here don't include pilot

Proof of Concept resulting in spin-offs

UU and QUB generating business

The total monetary impact derived from Phase I projects to mid-2017 is £11.7m; the equivalent figure for Phase II projects is £3.3m.

PoC is one step on the path towards commercialisation; whilst a small number of spin-outs have been generated, these projects typically depend on further investment and public support.

	Number of spin-offs	Number of spin-offs generating turnover	Spin-off turnover	Spin-off equity investment
QUB	15	7	£3.3m	£10m
Ulster	8	3	£0.5m	£0.5m

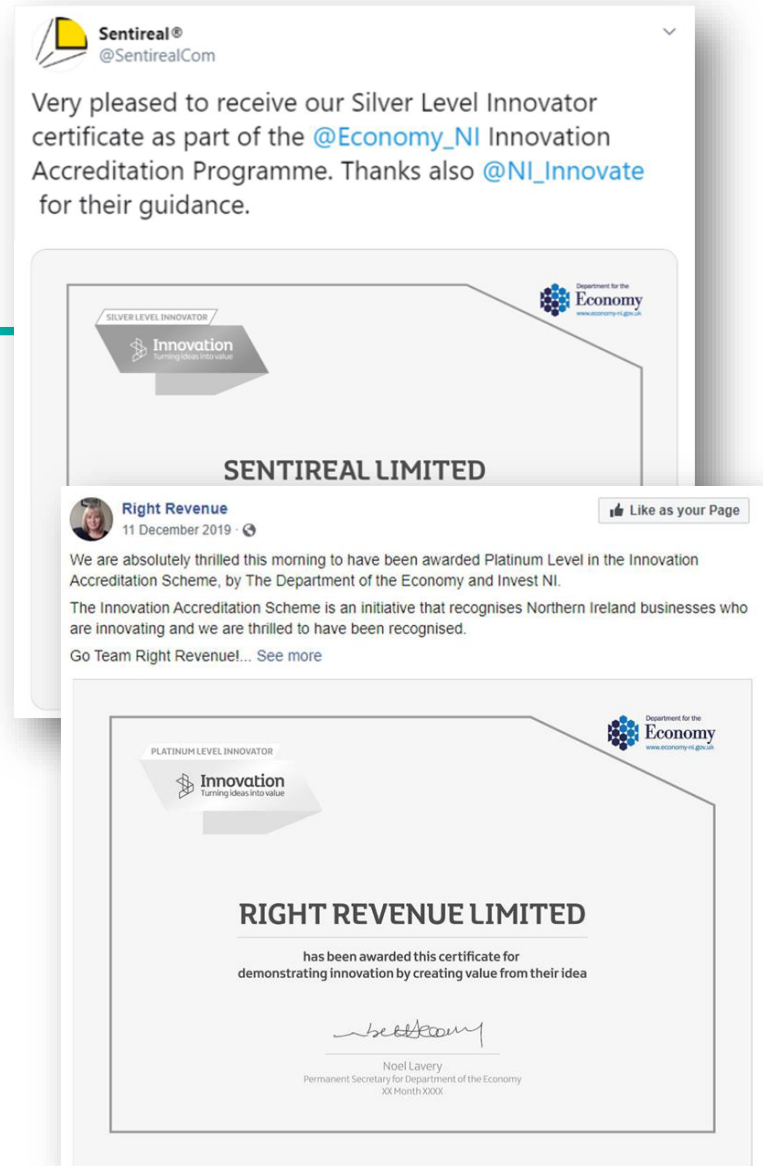
Innovate NI

Helping NI businesses on their innovation journey

Innovate NI is an innovation initiative by DfE, delivered by Invest NI, nearly £500,000* has been spent on Innovate NI from November 2018-2020. The scheme consists of:

- **An awareness campaign and resources**, following the journey - ideation, selection, implementation and commercialisation as well as an innovation diagnostic to determine the business' stage of innovation.
- Successful businesses receive a **recognition level** - bronze / silver / gold / platinum -based on the stage of innovation maturity.
- **i360 Innovation Accreditation** - an internationally recognised innovation accreditation process with Swedish innovation management company i360.

To date **620 certificates** have been issued, which companies can use to help promote themselves.



Source: Invest NI

Note: This figure is made up of £398,000 on a communication and awareness campaign from Q2 2019 to until Nov. 2020, and £102,000 on consultancy and other from Nov. 2018- Nov. 2020

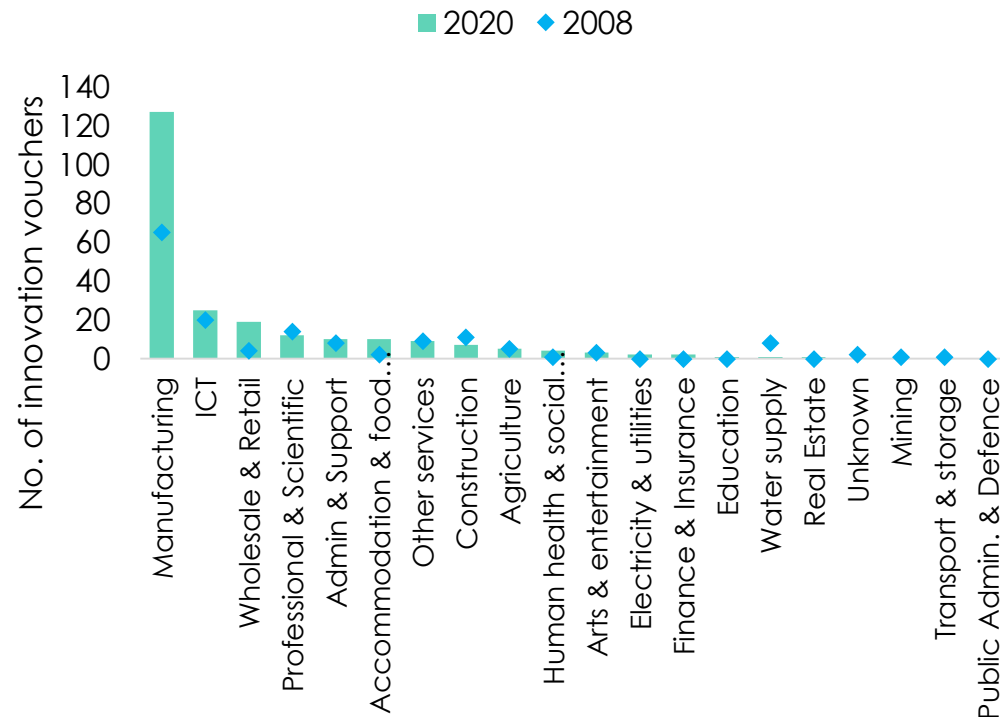
matrix.

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Invest NI Innovation Vouchers

Enabling access to specialist knowledge and information

Innovation vouchers by sector, 2008-2020



Since 2008 Invest NI have awarded 2,244 Innovation Vouchers, totalling £9.9million of commitments.

Manufacturing companies were awarded 47% of these vouchers followed by ICT (10%).

Case study: Ecohog Ltd., who design and manufacture recycling equipment for waste processors, were awarded a £5k Innovation Voucher enabling them to gain access to specialist technology and software information at UU and South West College's Design Associates to overcome an issue they were having with fan design.

Source: Invest NI

Invest NI Innovation Vouchers

Breakdown of the manufacturing sector

Innovation vouchers - manufacturing breakdown



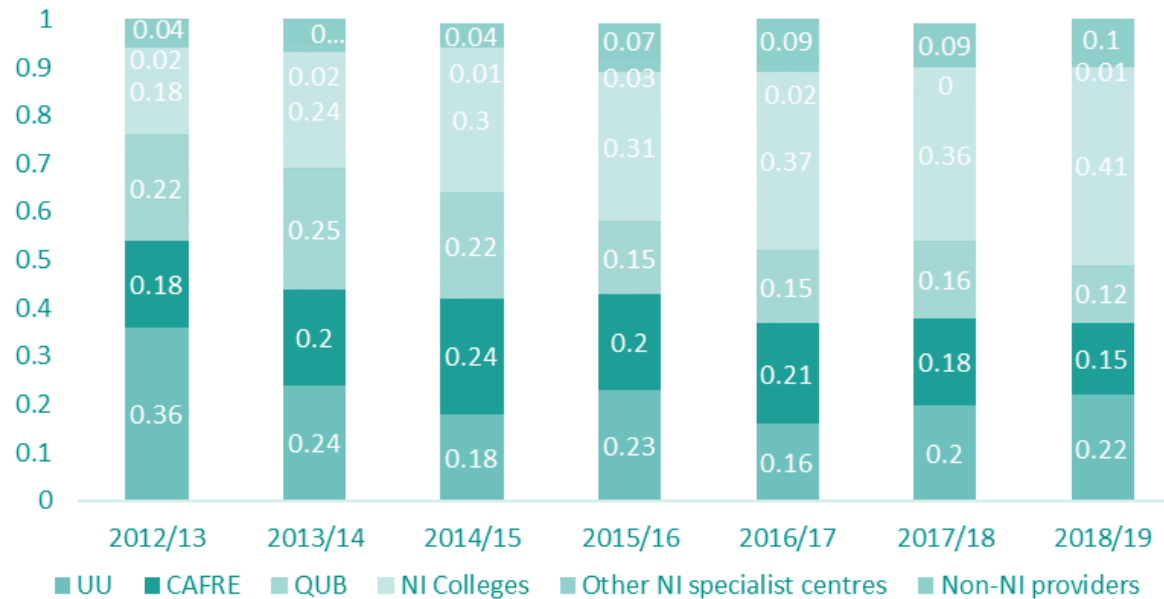
When manufacturing is broken down by sub-sector food and beverage manufacturing are the top sub-sectors.

Source: Invest NI

Innovation Vouchers Knowledge Providers

Colleges increasing their partnerships

Proportion of projects initiated by the three most used KPs (UU, CAFRE, QUB) and other institutions, 2012-2019



University of Ulster, CAFRE, and Queens University Belfast accounted for 70% of initiated Phase II projects and 54% of initiated Phase III projects.

South West College has been active since the outset with a dedicated team of business engagement specialists.

Other Colleges are now increasing engagement. North West Regional College, Southern Regional College and Belfast Metropolitan College accounted for just 8% of initiated Phase II projects but 23% of initiated Phase III projects.

Source: SQW & Invest NI

National funding- UK Research and Innovation

UKRI brings together seven disciplinary research councils* and the UK's innovation agency, Innovate UK

UKRI invested more than £78 million in active research projects in NI to 2019.

2019/20 projects include:

- **Ulster University- Cross-Council Funds-** Birth across the Borders: exploring contextual education as a catalyst for improved maternal health. **Award value £1.7million.**
- **Queen's University Belfast** - Medical Research Council- SWISH See Well to Stay In School: Randomised trial of spectacle distribution to decrease secondary school dropout rates in rural communities. **Award value £442,000.**
- **Belfast City Council** - Innovate UK- Virgin Park and Charge 2- building on-street charging solutions for hard to address residential areas using the existing and widespread power and communications network assets of Virgin Media. **Award value £55,000.**
- **Armagh Observatory** - Science and Technology Facilities Council- Dissecting the orbital and stellar-population structure of early-type galaxies with MUSE, project will lead to refereed publications providing results on the formation history of early-type galaxies and a new methodology for to dissecting the stellar-population properties of galaxies with multiple stellar components. **Award value £174,000**

Source: UKRI Competitive Funding Decisions from 2015-16 to 2019-20
Note: Research England, which is responsible for supporting research and knowledge exchange at higher education institutions in England

Innovate UK

Funding supports and connects innovative businesses through a unique mix of people and programmes to accelerate sustainable economic growth.

Since 2007, Innovate UK has invested around £2.5 billion in business, supported by a further £1.8 billion of private sector investment. This has returned up to £18 billion to the UK economy (UKRI).

Case study:

Exploristics: benefitted from support to develop software for clinical trial stimulation, this was a high risk, innovative project.

Innovate UK helped to 'de-risk' this project. They were able to get feedback from experts from the application stage. This helped Exploristics to gain a foothold in the market, hire more staff and develop their product, ultimately boosting revenue through R&D.

Region	Innovate UK total allocation 2017/18, £m
Northern Ireland	£9
Wales	£20
North East	£32
Scotland	£44
Yorkshire & Humber	£47
North West	£55
East Midlands	£65
East England	£114
South West	£134
South East	£184
London	£214
West Midlands	£235
UK	£1,152

Source: UK Research and Innovation & Invest NI

matrix.

Northern Ireland
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Summary – evidence of a strong collaboration and engagement, especially in manufacturing

- Total support spending per programme ranges from £500,000 (Innovate NI) to £78million (UKRI), with support helping the public and private sector.
- Public sector support is available to support innovation and collaboration from a range of programmes and for a broad range of activities.
- KTPs have been strong in supporting knowledge transfers with QUB and UU being in the Top 10 Knowledge Base institutions in the UK. However, in the Invest NI Innovation Vouchers programme, the direction of travel is toward delivery by **FE colleges rather than Universities**.
- **Manufacturing, construction and financial, professional and business services** are the top sectors for KTP. KTPs are reported to result in closer industry partnerships and better understanding of the industry - so policy interventions are producing effective outcomes.

Conclusions

matrix.

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Excellence in science and research

NI has a strong record, or is emerging as an area of excellence in:

- Pharmacy
- Medicine
- Biosciences
- Art and design
- Electrical and electronic engineering
- Education
- AI and computer sciences

Strengths in innovation activities

Innovation remains relatively **weak** in NI relative to other UK regions and the EU average

There are opportunities to “level up” NI’s performance to catch up with other areas.

The top three innovation active sectors in the UK are also areas of research strength in NI. These sectors are:

- **Research & experimental development on social sciences & humanities**
- **Computer & related activities / ICT**
- **Manufacturing of electrical & optical equipment.**

Science and innovation assets

NI benefits from investment in a number of **leading-edge research facilities** across a variety of subjects generating world class research

The **commercialisation** of R&D through **university spin-offs** is a notable success, particularly from Queen's University. **Competence Centres** encourage greater interaction between **academia, industry and the public sector** focusing on research areas that are of direct industrial relevance.

Overall, these research facilities support the subjects drawn out in science and research excellence including:

- **Medical research;**
- **Pharmacy;**
- **Biosciences;**
- **Manufacturing;**
- **Engineering;**
- **AI;**
- **Education;**
- **Sustainable Energy; and**
- **Food manufacturing.**

Extensive engagement between the research base and business

There is extensive engagement between the research base and business through a range of programmes, including (amongst others) Innovation Vouchers, KTP and Proof of Concept.

Manufacturing, construction and financial, professional and business services are the top sectors for KTPs. KTPs are reported to result in closer industry partnerships and better understanding of the industry.

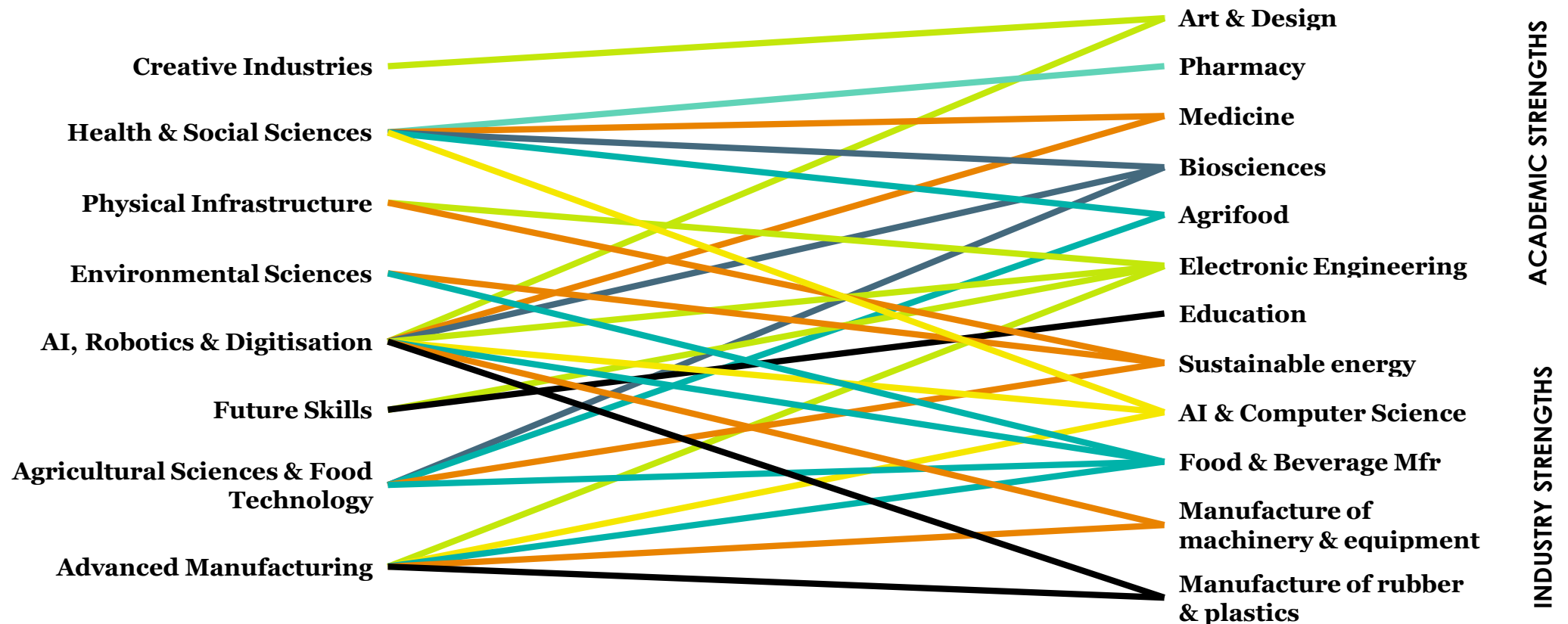
The Invest NI Innovation Vouchers provide significant support to the **manufacturing sector** and in particular, **food manufacturing**.

Participation in the Innovation Vouchers programme has broadened to include additional engagement with colleges.

NI research strengths and global research trends

GLOBAL RESEARCH PRIORITIES

NI RESEARCH STRENGTHS



ACADEMIC STRENGTHS

INDUSTRY STRENGTHS

Source: UUEPC

Note: Overlap may occur within subjects and the research/work carried out within these areas

matrix.

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