

# HEIF case studies 2021: Cluster E

The Research England-funded Higher Education Innovation Funding (HEIF) supports higher education providers to exchange knowledge with business, public and third sector organisations, community bodies and the wider public, increasing economic and societal benefits from their work.

The case studies below demonstrate the ways that English higher education providers have used HEIF to support knowledge exchange activities, and the impact they have achieved. Cluster E includes large universities with significant amounts of research funded by government bodies or hospitals.

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# Anglia Ruskin University: Supporting COVID-19 business recovery

## Brief description

In July 2020, ARU launched a new initiative designed to aid business recovery from COVID-19, consisting of three interventions: fully-funded internships; placement opportunities; and match-funded innovation vouchers. Organisations including businesses, charities and local government authorities whose operations were impacted by COVID-19 could avail themselves of one of these interventions to access ARU's knowledge exchange expertise through our staff and student / graduate talent.

## How this was supported by HEIF

HEIF was critical to the initiative. KE staff led on engagements with external organisations, determining their needs and ensuring ARU implemented the right intervention to make a difference.

HEIF supported academic staff buy-outs to deliver against innovation vouchers, and students / graduates to engage in KE through internships and placements.

## Societal, economic or student benefits

Recent ARU graduates were matched to and placed within an organisation for a total of eight weeks. During that time they worked on a pre-defined project that each participating organisation identified as being beneficial to their business objectives and that allowed the graduates to leverage and apply their academic knowledge.

Projects ranged from developing concepts and prototyping robotics hardware to developing digital marketing plans for companies in need of marketing expertise.

43 interns have been placed to date, with seven being offered permanent roles following completion of the initial internship. The internship programme has provided clear benefits to the businesses, created new employment opportunities for our graduates, and strengthened the ongoing relationships between ARU and those regional employers who took part in the initiative. We anticipate that many of these organisations will look to ARU to engage in future KE projects and to satisfy employment and skills needs.

The innovation voucher offer provided leveraged funding for research and innovation activities such as consultancy and contract research.

These activities provided up to £5,000 of funding in each case, with the expectation that business match the funding provided by ARU 1:1 to cover the cost of the ARU services. The scheme has provided support to a variety of organisations across the eastern region, including a family support charity that specialises in supporting the skills of parents/carers to achieve health and positive outcomes for children, and a health and wellbeing company that have developed an online training programme that will help to investigate whether internal body awareness could improve mental health and reduce lockdown-related stress.

ARU partnered with Essex County Council to deliver a number of paid student placements. These placements directly support the work taking place within the authority's Strategic Planning, Public Health and Environment directorates and delivered benefit to the Essex region.

## Supporting government priority areas and RE-UKRI and OfS strategic objectives

ARU's Supporting COVID-19 business recovery initiative has helped level up the region; improved the skills and increased employability of our students and graduates; driven creative ideas and innovations;

grown jobs; and created societal and economic benefits, all of which deliver strongly against government priorities and Research England and OfS strategic objectives.

# Anglia Ruskin University: Students at the Heart of Knowledge Exchange (SHoKE)

## Brief description

The Research England and OfS funded Students at the Heart of Knowledge Exchange project, in collaboration with local government partners, scales up and enhances existing employability initiatives and introduces new interventions which are designed with the specific composition of ARU's student body in mind.

It engages students in team-based multi-disciplinary knowledge exchange activities through a range of interventions which provide opportunities for students from all backgrounds to find an entry point that suits them, lowering the barriers to participation.

The project provides students with relevant, real-world opportunities to make a difference through projects that create societal impact and resonate more closely with their own experiences.

The project comprises of 4 different levels of student engagement:

- Impact:24; 24 hour 'challenge events' engaging with multidisciplinary UG & PG students to identify potential solutions to societal problems. Culminating in a formal presentation to senior council staff.
- Student Consult; One-month management consultancy projects delivered by teams of postgraduates and researchers, formally trained by a management consultancy company the Nous Group, to work on 'real world' problems experienced by partner organisations.
- Student KE Community; A student network brings together a diverse community of students to realise the benefits of KE activities through experimental workshops and events. This community informs the SHoKE program how to best engage with students.
- Open Innovation Workshops; Transform big societal problems into collaborative research projects - bringing together our academics, post graduate students, and external partners to co-create innovative multi-disciplinary research opportunities.

## How this was supported by HEIF

KE staff led the development of the project and continue to play key roles through contributing their time to the project's governance and management.

## Societal, economic or student benefits

This project significantly expands student knowledge exchange activity at ARU and provides access to professional consultancy skills development for both academics and students.

By the end of the program over 350 new students will have engaged in KE activities with our partners Essex County Council and Cambridgeshire County Council, solving real social issues that the Councils face, engaging with Council staff and delivering valuable insights for their operational and strategic teams.

This process embeds our students deeply into the Council teams, creating a direct economic impact to council service provision.

Early assessments indicate that the student volunteers have benefited greatly from the problem-solving activities, increasing in personal confidence, developing new skills and expanding their professional networks.

## **Supporting government priority areas and RE-UKRI and OfS strategic objectives**

Research England and the Office for Students have part-funded the SHoKE project as part of the wider Student Engagement in Knowledge Exchange program to demonstrate the student benefits through their involvement in knowledge exchange activities.

The SHoKE project will provide evidence of the effectiveness and impact to the student as well as the external partners, and exemplars of good practice which can provide transferable insights across the higher education sector.

The project will directly help improve our region and support innovation in local government processes and services.

# **Bournemouth University: Combating the effects of financial scamming**

Financial scams cost the UK economy billions of pounds every year with the scammers targeting older people and vulnerable as a priority.

Age UK estimates that an older person becomes the victim of fraud every forty seconds. Research undertaken by Bournemouth University's National Centre for Post Qualifying Social Work (NCPQSW) into financial fraud has so far saved vulnerable consumers over £22 million pounds worth of scams.

Professor Lee-Ann Fenge has led the Centre in multiple projects leading to the development of learning resources and digital applications which have been used by national bodies such as Trading Standards, the NHS and Age UK to educate and inform vulnerable groups of people about the risks and potential harms posed by financial scams.

This has also supported UKRI's aims to build capacity to respond to national agenda, as it is in line with the ageing society element of the Grand Challenges.

Building on a body of research and public engagement activities by the Centre dating back to 2015, the aim of the HEIF funded project was to use gamification to increase the impact and accessibility of research into financial abuse from scams and the development of games such as "Scams and Ladders" as learning tools for the public and professionals.

Fusing expertise from across the health and social care sectors and the creative and digital sectors, the resources produced offered older people and professional groups the opportunity to learn in an interactive and safe way about the risks posed by financial scams and best practice for responding to scam involvement.

HEIF funding was used by the project team to:

- Finance digital and physical game development and production (game boards and cards)
- Hire a research assistant in order to provide technical analysis of game play data and to complete the project on time and to ensure quality standards were maintained throughout
- Finance eight pilot events in Dorset and Norfolk to test and evaluate the materials

The study also offered useful perspectives to the digital and creative industries on the design of gamification implementations for older people as well as professional practitioners about responding appropriately to financial scammers.

The UK government's Digital Inclusion Strategy aimed to have 90% of the UK adult population online by 2020.

This increase in the numbers of older people using the internet meant a requirement to ensure that they use the internet safely and have increased awareness of potential scammers.

The project team set out to build on BU's strengths in research and public engagement around financial scams by developing excellence into the future through gamification, resulting in increased awareness and proactive responses to financial scammers.



Since 2016, the Centre has worked with Conor Burns MP to create the All Party Parliamentary Group on Financial Crime and Scamming.

The impact of the research has been widespread with the resources being used by such national organisations as National Trading Standards, Age UK, Lloyds Bank, the NHS, the Burdett Trust and Royal Mail.

# Northumbria University: Collaborative Newcastle

Northumbria's collaborations with external stakeholders create outputs and demonstrate relevance of its research to the economy and society. Newcastle City Council, Newcastle University, Northumbria University and NHS partners represent the anchor institutions in our city.

[Collaborative Newcastle](#) is a shared commitment to improve levels of prosperity, opportunity, sustainability, health and wellbeing for local communities between the anchor institutions in the City.

It has never been more important, given the enormous challenges facing communities as a result of the Covid-19 pandemic, that we work together to address need and maximise opportunities.

Northumbria and Newcastle Universities have come together to form the Collaborative Newcastle Universities Agreement (CNUA) - a civic university agreement which supports the [City Futures Board](#) themes of Prosperity, People and Planet.

The universities are contributing to these themes which will deliver against university KE strategies, regional and national priorities as well as contributing to economic and societal development as set out here:

## Prosperity

- Maximising output from our research and innovation to support sustainable economic growth (healthy ageing, health innovation, digital living, culture and creative industries, energy and climate change).
- Creating a culture of enterprise and entrepreneurialism through increased numbers of start-ups, scale-ups and volume of business support
- Growing the number of highly skilled professionals in the NE economy through a collaborative approach to Skills, Continuing Professional Development and Lifelong Learning
- Supporting the post Covid revitalisation of the city as a place to live, work, study, do business and invest

## People

- Growing the rate of participation in higher education by improving access
- Enabling students from all backgrounds and cultures to have a positive experience whilst living, studying and working in the city and wider region; for our communities to have a positive experience of living and working alongside our students; and for the city and region to benefit from the skills, knowledge, experience and diversity that students bring (from the research).
- Developing future leaders through Newcastle 150, addressing the question: "How, and to what extent can we make Newcastle a greener city by 2032"

## Planet

- Reducing our collective greenhouse gas emissions to achieve Net Zero by 2030, and supporting the delivery of the Newcastle Net Zero Action Plan
- Maximising the impact of our research and education to support Newcastle and the North East to be a leading location for a green economy, including Green Growth Summit in 2021 in partnership with NTCA

- Supporting and engaging with the forthcoming COP26, including supporting the North East England Climate Change Coalition
- Utilising our research to improve the local environment and urban design

The above work (by students) has been directly supported by business and engagement staff under Northumbria HEIF strategy. It delivers on many of the important priorities set out in RE-P-2020-03 around the contribution of universities to COVID-19 crisis and recovery, such as place and civic contributions and in addressing the Government's levelling up agenda.

It also supports the R&D roadmap as well as the vital role of students in delivering knowledge exchange through a programme of volunteering and undertaking work experience and employability activity.

# Northumbria University: Northumbria Enterprise and Business Support Project (NEBS)

Northumbria Enterprise and Business Support Project (NEBS) was an ERDF / HEIF funded project which ran from 2015 to 2018.

With funding from the European Regional Development Fund (ERDF), Northumbria University's HEIF allocation and other partners, NEBS delivered a package of support to improve the competitiveness and growth of small and medium-sized enterprises and the creation of new enterprises in Northumberland and Tyne and Wear areas within the North-East Local Enterprise Partnership area (NELEP).

The project had two strands:

1. Encouraging SMEs to benefit from employing a graduate for up to 26 weeks, thus supporting the capacity of SMEs to grow in national and international markets and to increasing innovation
2. Delivering mentoring and support for graduates to drive up business creation, providing expertise and mentoring around business idea development, business creation and on-going specialist mentoring and support for companies in the first three years of trading.

The project was extremely successful resulting in 85% of interns being retained by the SME beyond the length of the funding, 142 entrepreneurs assisted, and 31 new businesses created.

**Great North Run Case Study:** Mass participation-sporting events specialist The Great Run Company was able to employ Northumbria University graduate Susie Brown.

The 26-week paid internship, facilitated by the Northumbria Enterprise and Business Support (NEBS) initiative, was part funded by the European Regional Development Fund (ERDF) and part-funded by Higher Education Innovation Fund (HEIF).

Rebecca Brown, HR Manager at The Great Run Company, said:

“When Brendan Foster organised the first Simplyhealth Great North Run in 1981 it must have been difficult to imagine that 36 years later it would be one of the biggest mass-participation sporting events on earth. Taking on Susie added a new dimension to this as we seek graduates who can provide dedicated support to the managers, while also keeping open a path to them to grow their career in event management.

The support from Northumbria in terms of funding was great for us.”

Victor Ottaway, Graduate Internship Manager at NEBS, said: “The overall aim of the NEBS ERDF grant is to ensure that small and medium-sized businesses can access help to invest in their next generation of talent, become more competitive and commercially sustainable. The Great Run Company's graduate development strategy complemented this perfectly, so that together we can help the business expand sustainably and create a fabulous employment opportunity for a high calibre graduate.”

The NEBS Project demonstrated the collaborative role universities can play in promoting business and economic growth. Interns bring energy, drive and innovative thinking to a business, and they can provide

fantastic career prospects for graduates. The University is delighted to have launched a continuation NEBS project which commenced in Oct 2020 and which will build on the success of the first round.

# Coventry University: CyberOwl Ltd

## Brief description of activity

CyberOwl Ltd is a spin out of Coventry University, formed in 2016 the company has taken University instigated intellectual property to create a portfolio of cyber security products, initially focusing on the maritime sector.

The founding team combines experience in developing, securing and operating large distributed systems. The company's mission is to leverage data and analytics to shift organisations towards an active cyber posture. Medulla, their first product, is the beginning of a suite of capabilities to achieve this mission. The first product and management services have been rolled out to multiple vessels and product licences have been sold for 3-year terms to large international shipping companies, providing the delivery of service at scale and increasing revenue in the medium term.

In 2021 CyberOwl went from the classification of a seed company to that of a venture company following a round of investment in 2020 of £1.8m in total.

## How this was supported by HEIF

The development to commercialisation and formation of CyberOwl was supported by the Intellectual Property and Commercialisation Unit (IP Team). The IP Team, alongside patent searches, filings and support provided by patent attorneys was supported by HEIF. The IP Team provided further supported in securing funding for research projects leading up to the development of the company, and in putting together the business plan for spinning out from the University. As a shareholder of the spin out company the University has a nominated non-executive director on the board of the company, appointed at cost to the University, and supplied using HEIF derived income.

Once the company had spun out from the University initial investment pitches were supported by the IP Team, and initial funding was secured from Mercia Technology Seed Funding (now Merica Asset Management) which enabled the company to scale and grow successfully over the first few years.

## Societal, economic or student benefits

CyberOwl is developing, piloting and using technology and systems that are centred on targets and asset activity to provide early warnings of cyber-attacks.

Currently the threat of cyber-attacks across all sectors is consistent, growing and creates significant disruption and distress. The Medulla product, already available and in use in the maritime and shipping industry, is meeting this global need for security and providing a managed service to increase confidence in protection in the cyber domain. The West Midlands has some of the highest unemployment rates in the UK. CyberOwl has established an R&D base in the West Midlands supporting 8 employees in technical roles and taken 7 placement interns from Coventry University. CyberOwl have then gone on to hire 3 of those placements in full time roles

## Supporting government priority areas and RE-UKRI and OfS strategic objectives

Cyber security is a global concern, and the creation of solutions to the vast and growing threat of cyber security meets the needs of the United Nation's Sustainable Development Goals by providing the secure means of communication, information storage and management and stability of ICT infrastructure. In many ways reliance on ICT has become so fundamental in the delivery of innovation and change in society that supporting and protecting that ICT infrastructure is an essential part of delivering on the wider SDGs.

The UK Government has established the National Cyber Security Centre to make the UK the safest place to work and live online. In line with this, CyberOwl was a founding member of the National Cyber Security Centre Cyber Accelerator and the London Office for Rapid Cybersecurity Advancement, two flagship initiatives by the UK government to develop global centres of excellence of cutting-edge cyber security innovation.

# Coventry University: Network 2 Supplies – Bioleaching

## Brief description of activity

Network 2 Supplies Ltd (N2S) began working with Coventry University in 2017 to explore ways of developing in-house capabilities to expand and grow their business, focused on recycling IT waste. Already a strong company with steady growth the company wanted to create better solutions.

Working with the University the company identified an opportunity to work with the research team to develop in-house bio-leaching capability for the extraction of precious metals from Waste Electrical and Electronic Equipment. This process enables the recovery of precious metals including critical raw materials whilst preserving the environment and preventing health-related issues worldwide. To begin N2S applied with the University for a Knowledge Transfer Partnership from InnovateUK, the 3 year project started in 2018. Part-way through the project further opportunities were identified, and on new projects. N2S then funded a PhD project which started in 2019 and began discussions through the University with DEFRA, the Department for Environment Food and Rural Affairs in the UK.

- Funded Student Knowledge Exchange

In 2019 N2S presented at the DEFRA hosted launch of their e-Sustainability Alliance (DESA) on the future of bioleaching and E-waste, a video is available [here](#).

## How this was supported by HEIF

The relationship with N2S has been continuously supported by KE staff, from initial discussions and identifying possible routes forward for collaboration, through to the application for the KTP, and then onwards into the development of the new PhD project and the development of a relationship with DEFRA. The PhD project, focused on the biorecovery of precious metals from mobile phones, is co-funded by the University, supporting the continued growth and sustainability of N2S as a company, and investing in bioleaching research for future development of recycling technology by the University. Example activities include:

- Supporting access points for external organisations including industry focused podcasts, including [this](#) example with ADISA.
- Supporting public engagement through participation in the [Festival of Circular Economy 2021](#).
- Facilitating knowledge sharing and diffusion through the Webinar that took place on International E-waste day, bringing together the academic team, N2S Ltd and partners including BT, and DEFRA.

## Societal, economic or student benefits

N2S is a growing, innovative company focused on the future of IT recycling to reduce pollution and cost, and increase the viability of a circular economy for WEE and the precious metals used in IT equipment. Since working with Coventry University, and exploring new ways of recycling IT equipment, N2S has established its own biotechnology laboratory, employed new staff and had a growth in turnover of almost 50%.

N2S is openly focused on 3 core UN Sustainable Development Goals:

- Goal 6 – Clean Water and Sanitation  
Measured in terms of litres of H<sub>2</sub>O avoided through reuse and recycling of IT
- Goal 12 - Responsible Consumption and Production  
Measured in kilos of IT assets processed through reuse and recycling with 0% to landfill
- Goal 13 - Climate Action



Measured in kilos of CO2 avoided through reuse and recycle cycles

**Supporting government priority areas and RE-UKRI and OfS strategic objectives**

The KTP project, PhD project and ongoing work with DEFRA and the UN Sustainable Development Goals delivered collaboratively between N2S and Coventry University link directly to the UK Government priority, established through DEFRA, for a cleaner, healthier environment, benefiting people and the economy.

## De Montfort University: Supporting Leicester's recovery

The city of Leicester has been in lockdown longer than anywhere else in the UK. As a result, its economy is predicted to suffer more than other cities in the region as PwC's [Good Growth for Cities Report 2021](#) found Leicester was expected to suffer more economically in comparison to other cities in the Midlands, with a growth rate of -12.2% in 2020 compared with other cities such as Birmingham at -11.7%.

To support recovery, De Montfort University Leicester (DMU) put together a programme called Build Back Better to come up with ideas that could help the city recover as strongly as possible. Its public engagement team DMU Local, ran consultations with community partners and organisations across the city while DMU's business services team reached out to contacts in the city's business community.

Online meet-ups and debates were held to gather views throughout the summer of 2020, with support from the university's HEIF allocation. Following a public consultation, more than 450 separate recommendations were detailed in a Build Back Better Action Plan.

Research was also carried out using HEIF funding to show which communities and sectors in Leicester had been hardest hit and therefore would need targeted support. An economic study carried out by DMU academics supported by HEIF funded found the city had twice the numbers of temporary recruitment agencies than the UK average; 75% of jobs in Leicester were in the sectors hit hardest by COVID-19, such as hospitality and retail; and that only 30% of work in Leicester could be done from home. These facts were used to support the city's case for extra Government supporting during lockdown.

A total of 70 university academics and researchers, along with 40 organisations came together to model community solutions for future work in the city across five areas – economy, infrastructure, health, environment and community.

Earlier in the pandemic, an emergency volunteering programme organised by DMU in collaboration with city partners saw staff and students work a total of 450 shifts contributing 2,500 hours cooking meals, organising food parcels, delivering food and visiting homes offering support to the isolated and those shielding in difficult and challenge conditions for volunteering.

An emergency distribution centre was also set up with a charity at a DMU sports centre to accept PPE equipment made by individuals and companies and was then delivered to Leicester's hospitals, care homes, charities and schools by volunteers. In total, 5,095 plastic visors and 200 sets of scrubs were distributed – the scrubs and 1,000 visors were made by DMU volunteers.

Some 30 ideas are now being taken forward by the city Mayor's office to become part of the city's recovery reality, delivered in partnership with DMU and organisations around Leicester.

## **De Montfort University: DMU research delivers real-world benefits to the shoe industry**

De Montfort University Leicester (DMU) worked with the British Footwear Association and city company Micro-Fresh to help the shoe industry combat the devastating effects of Covid-19.

Workers in shoe manufacturing companies were concerned about transmitting coronavirus as they passed leather materials through the different stages of the shoe-making process. It was not known whether Covid-19 could be transmitted via touching the same materials, or how long it could remain active on the leather used in shoe making.

DMU researchers were able to show not only how the virus behaved on leather materials but how that could be mitigated. DMU was able to use its connections to not only delve into a problem but deliver a solution, working in partnership.

As a result of this innovative collaboration, new guidelines are being produced for how shoe manufacturers should deal with the different stages of the manufacturing process, and Micro-Fresh's antibacterial and antiviral properties have been shown to tackle the Covid-19 virus on leather.

DMU used some of its HEIF allocation to support tests carried out by its microbiology team led by Professor Katie Laird which examined how the virus behaved on fabric, how long it survived, and how it could be transmitted by touch.

At the same time, Prof Laird was also working with Leicester company Micro-Fresh to evaluate its products which prevent bacterial growth. DMU was able to introduce the company to the British Footwear Association and broker a new research programme to investigate the role of leather in the transmission of coronavirus using human coronavirus and determine if a Micro-Fresh coating could reduce the transmission and survival of coronavirus on leather.

The results found that the Covid-19 virus could survive on untreated calf leather for 48 hours and for 24 hours on patented and finished leather. However, once treated with the Micro-Fresh spray-on coating, it was undetectable within two hours.

This finding was shared with the British Footwear Association (BFA) and will be communicated to its members which range from small artisan makers to some of the largest shoe manufacturers in the world. A webinar was held with the BFA leaders to share findings and a guide is being put together so that manufacturers know how the virus behaves on the leather materials used in shoe making and how they can tackle it.

Prior to being introduced by DMU, the British Footwear Association and Micro-Fresh had not worked together and there are further opportunities for collaboration, not to mention a new avenue for Micro-Fresh products in the shoe industry.

This project was all about collaboration - it took all three partners working together to solve a major problem for an industry and open up new opportunities for another company.

DMU's research was able to discover how the Covid-19 virus behaved on leather and communicate those findings to the British Footwear Association. The university was also able to use its connections in the

Leicester business community to find and test a potential answer to those problems, using the company's existing products. The research has been able to deliver real-world benefits to industry at a time when everyone has been affected by the impact of Covid-19.

# Goldsmiths, University of London: Dek Business Growth Programme

Working in partnership with Lewisham Council and London South Bank University (LSBU), Goldsmiths delivered the [Dek Business Growth Programme](#) during the Higher Education Innovation Funding (HEIF) period 2016 to 2021. The project itself took place between 2017 and 2020.

The project was funded by the European Regional Development Fund (ERDF) and aimed to support business growth in London-based SMEs, working towards new products, services and processes alongside job creation. At Goldsmiths, the project was delivered by the HEIF-funded business engagement team who had oversight of recruitment to and administration of the project on Goldsmiths' end.

The project partners responded promptly to the challenges presented by COVID-19 in March 2020. Delivery quickly moved online, and we developed a number of workshops specifically tailored to help businesses survive during the pandemic.

The Dek Business Growth Programme epitomised the Government's aims to cultivate effective knowledge exchange between universities and their local areas. The project was managed by Lewisham Council, leading to an official memorandum of understanding, which underpins our commitment to local growth and regeneration.

The business growth aims of the programme supported the ideas, people, business environment and places of the industrial strategy by combining Goldsmiths' sector leading research with its invaluable local knowledge to create jobs and help businesses to thrive.

Student involvement was a key element of the Dek Business Growth Programme. A number of Goldsmiths students and recent graduates registered their own businesses onto the programme, and a number of companies benefited from placements with students or recent graduates. Several of our consultancy projects have led to long-term work opportunities for the students and graduates who were involved.

The Dek Business Growth Programme programme consisted of:

- **Workshops**  
Delivered by expert tutors from Goldsmiths and LSBU, workshops covered everything from digital literacy and social media, to accounting and resilience
- **Bootcamps**  
Goldsmiths' pioneering '12 steps to growth bootcamp' helped our SMEs to identify their barriers to growth, and to explore how they might overcome these barriers to create new products, services, processes and jobs
- **Mentoring**  
Bespoke one to one mentoring helped over 50 businesses to address their business challenges and work towards the project's growth outcomes
- **Consultancy with student placements**  
Goldsmiths academics from multiple academic departments delivered consultancy projects to 30 SMEs. By combining academic oversight with student and graduate placements, we were able to

ensure value for money and deliver effective projects without placing an unsustainable burden on our academic staff.

Academics from departments of Computing, English and Creative Writing, Media, Communications and Cultural Studies and our Institutes of Management Studies and Cultural and Creative Entrepreneurship delivered projects during 2020.

## **Conclusion**

Despite the economic uncertainty and the challenges of COVID-19, we were able to deliver on and exceed all our targets for the programme.

Following the programme's completion, we are now incorporating much of the material developed for Dek Business Growth Programme into Goldsmiths' other HEIF-funded activity, notably the NX Hub which will support SMEs and creative sector businesses in London and South East England during the next HEIF period. The NX Hub consists of 250 plus businesses, many of which were introduced to Goldsmiths by the Dek Business Growth Programme.

## Goldsmiths, University of London: SHAPESLewisham – New Cross and Deptford creative enterprise zone

Working with cultural organisations across the London Borough of Lewisham, Goldsmiths has been a key partner in delivering SHAPESLewisham; one of six Creative Enterprise Zones (CEZ) in London.

The New Cross and Deptford CEZ was established following a successful bid to the Mayor of London and is LB Lewisham's flagship economic development project. Goldsmiths played a leading role in developing the concept, formulating the bid and in its implementation. HEIF-funded staff within Goldsmiths' Research and Enterprise Team have been members of the CEZ's overarching strategy board throughout the project, and have contributed to a number of CEZ-led initiatives.

The CEZ Action Plan describes the area as, "where the arts meets technology, where socially engaged creative practice realises its commercial potential, and where global excellence in research and teaching connects with one of London's most radical and high growth creative industries clusters". It goes on to say that, "Goldsmiths is our key creative engine – and a vital driver of London's creative economy. It provides much of our talent, has shaped the district's creative identity for several generations, and it has pioneered new ways of working that are transforming the very ways we operate as cultural beings."

The CEZ established six priority action areas:

1. Creative Clusters and Networks - to share experience and represent wider creative assets; develop a new identity for Lewisham North
2. Creative Production Space – to improve access to available space and facilities for creative businesses
3. Creative Business Development - develop a multi-purpose enterprise space in partnership with Goldsmiths for collaborative innovation
4. Employment, Enterprise and Skills - develop new approaches to improving creative careers guidance and support for children and young people
5. Policy - understand which public sector assets have creative value and need to be preserved / converted and input into Local Plan policy in support of the sector
6. Community Links and Socially Inclusive Places - showcase the diversity of local talent; raise the profile of creative businesses; and create more placement and volunteering opportunities

The CEZ builds on earlier work set out in the Lewisham Creative & Digital Industries Strategy which set a vision for Lewisham to, "become one of London's fastest growing creative and digital boroughs – by building upon the borough's internationally recognised institutions and by working together with local partners".

Unlike other partners in the CEZ, the majority of Goldsmiths' contribution to the project has been provided in-kind. This has resulted in an alignment between Goldsmiths' priorities and those of its locality; with two-way engagement driving our interactions with businesses and communities in Lewisham.

In the latter stages of the CEZ (whose funding ends in September 2021), Goldsmiths has taken a lead in delivering the [Creative Business Exchange](#); much-needed business support offered free of charge to businesses in and around the CEZ. On top of this, Goldsmiths is delivering a key piece of research into the creative supply chain which will inform Lewisham's cultural strategy for years to come.

## **Kingston University: BIG South London – growing knowledge exchange in partnership with the South London Partnership**

Kingston University (KU) is an anchor institution in South London and is committed to developing meaningful partnerships across the region, to enhance opportunities for staff and students and help our regional economy grow. Through close collaboration with the South London Partnership (SLP) we develop and participate in a wide range of programmes across five boroughs (Croydon, Kingston-upon-Thames, Merton, Richmond-upon-Thames, Sutton) of the sub-region including the Mayor's Construction Academy Hub, the InnOvaTe Internet of Things and the BIG South London Knowledge Exchange programme.

BIG South London originated from a shared understanding of the need to improve economic performance in the SLP region, and of knowledge exchange as a catalyst for growth. SLP and KU scoped the concept that led to the vision of a world-class ecosystem of research, innovation, KE and enterprise between businesses, universities, FE colleges and communities. Aligned to the priorities of the R&D Roadmap to drive innovation and productivity, the programme aims to inspire academic talent by connecting researcher development and university innovation to business needs, supporting the aims of regional institutions to deliver in an inclusive innovation ecosystem.

Supported by KU HEIF-funded Business Engagement posts, funding for seed-corn projects and academic buyouts, BIG South London has become a £6m Business Rate Retention Pot funded programme involving six HEI partners (KU, University of the Arts London (Wimbledon College of Art), London South Bank University, University of Roehampton, St Mary's University and Sussex Innovation (University of Sussex)). It is aligned closely to Further Education Colleges and Boroughs to deliver an ambitious, pioneering programme of activities crucial for unlocking opportunities for knowledge-based economic growth in the SLP boroughs.

Commissioned prior to the global pandemic, BIG South London provides a timely intervention as the SLP region struggles with declining GVA and productivity, with approximately 32,000 jobs losses but also the acceleration of opportunities in home/agile working practices and an exponential shift in digital economy opportunities. A place-based focus supports innovation-led economic growth by helping local businesses improve their productivity through engagement with six HEIs, enabling over 400 businesses, 210 business/HEI collaborations, developing 90 new products and business processes and creating 100 new jobs in the region. This is delivered by:

- Knowledge Exchange Partnership and connected infrastructure, by establishing long-term effective partnership working between HEIs & the boroughs to access resources, facilities and expertise supported by a programme of Knowledge Exchange Services
- Delivering an exemplar programme of knowledge exchange, innovation, enterprise and entrepreneurial support for businesses and organisations throughout the region as a means of developing an inclusive innovation talent pipeline aligned to an augmented supply chain for good, services and expertise
- Addressing systemic shortage of commercial and innovate workspace by supporting seven borough workspaces as hubs integrated with regional Knowledge Exchange Services.

As the largest, most diverse HEI in the region, KU has a pivotal role in knowledge exchange and innovation ecosystems across South London. Utilising HEIF funding to support this activity has resulted in KU collaboration with SLP and BIG South London to meet shared objectives for the region.



## **Kingston University: Chartered Association of Business Schools Small Business Leadership Programme**

Kingston University's outstanding performance in developing entrepreneurial skills and in facilitating start-ups forms part of our longstanding commitment to supporting and nurturing a thriving SME community. Kingston Business School (KBS) supports the SME community through a range of initiatives, including the work of the Small Business Research Centre, The Nest business incubation space, through the newly formed Sustainability Living Lab and in 2019 KBS provided business support provision through the BEIS funded Small Business Charter accredited Business Basics 1 & 2 programmes of business fundamentals to 33 start-up companies.

The profound impact of the Covid-19 Pandemic on the SME community led to BEIS delivering a £20million support package to help small businesses develop resilience and bounce back from the impact of Covid-19 in the turbulent climate. Leading from the Business Basics programmes, KBS along with the Small Business Charter and 19 other business schools developed and delivered The Small Business Leadership Programme, a specialist BEIS funded programme for leaders of small businesses to survive and thrive during and post Covid-19.

Kingston University ran 12 cohorts, the highest number of cohorts among the consortium members, over a period of 5 months directly supporting 294 business leaders and senior management team members from around 260 companies. The short and focused programme was delivered online over the course of 10 weeks and was a combination of workshop, mentoring and facilitated group work allowing the opportunity for businesses to strengthen their business network, with a curriculum exploring leadership, innovation, employee engagement, operational efficiency, marketing, sustainable practices, and finance.

Our HEIF funded Business Engagement team supported the programme throughout the development and delivery from managing contractual agreements and programme setup to promotion of the programme, recruiting participants and supporting the graduation ceremonies. Our team also provide ongoing support by keeping participants informed of the ways in which they can further benefit from engaging with the University via the different communication support channels established with them following the programme.

The success of the programme and the insights generated from evaluating the needs a large cohort of SME's has subsequently enabled KBS to develop more tailored programmes to meet the emerging business and economic needs as highlighted in Build Back Better. Moving forward HEIF funded posts will support work with the Chartered Association of Business Schools, our fellow members and BEIS on the next management training and mentorship provision for SMEs (Help to Grow:Management scheme) as part of the curriculum development work group and continue our work to support businesses to successfully rebuild, innovate and thrive.

# **Manchester Metropolitan University: Intervention in operations and new technologies guides Deluxe Beds through COVID-19 disruption**

Deluxe Beds Ltd is a family-run manufacturing business based in the Yorkshire Pennines. They originally approached the University to work on a project that focused on operations efficiency. However, the COVID-19 pandemic caused disruption to their supply chain and a temporary shutdown in production. The scope of the project was redefined to focus on developing business resilience and enhancing operations systems to ensure Deluxe Beds could keep serving their customers.

## **The projects**

Dr Sammar Javed, worked within the company to implement new ideas and system changes. A bespoke framework was developed to aid Deluxe Bed's business development and growth targets and embed innovative management practices to enhance and improve the efficiency and effectiveness of the manufacturing processes and supply chain.

An academic team worked directly with the company's senior management to develop the business's strategy, cash flow management, and a process to bring production back to the required level despite the disruption of the pandemic.

Through successful financial planning, the company was able to properly manage its cash flow as well as the employee furlough situation and return to manufacturing while introducing remote working for office staff, system upgrades and database development.

## **Use of HEIF funding**

The company's investment into this project was matched by Manchester Met's HEIF-funded Innovation and Industrial Engagement Fund, which is applied to the costs of delivering the project, which includes buying out academic staff time and other related project delivery costs. HEIF funding also supports the salaries of business engagement staff who support academic colleagues in identifying the project opportunity, defined the scope of the project, applying for the funding and negotiating with the business partner.

## **Benefits achieved**

The benefits to Deluxe Beds align to various government priorities such as:

- Enhancing regional growth and productivity - Deluxe Beds was able to cut costs by almost £220,000 as well as gaining efficiency and improving productivity
- Economic recovery – By working with Dr Javed, Deluxe Beds develop crisis response and management skills that were crucial during the unprecedented effects of the COVID-19 pandemic.
- Levelling up – Deluxe Beds is based in the Yorkshire Pennines, outside of the better supported urban business centres of Leeds or Manchester. Their enhanced productivity and cost-efficiency are directly related to their growth and the ability to create jobs, benefitting their local community.

Khatiza Bibi, Managing Director of Deluxe Beds Ltd, said: "We are thankful to Manchester Metropolitan for opening doors of opportunities for us. The academic team has played a critical role in improving various departments and areas.

Following the success of this project, Deluxe Beds is running a new Management Knowledge Transfer Partnership (mKTP) with Manchester Met, which started in March 2021. This two-year project will look to develop and implement a human resource strategy, management structure and systems within Deluxe Beds to optimise productivity, drive growth and enhance employee engagement. KTPs create employment opportunities for University graduates as KTP associates and also have a tendency to create strong relationships with the business leading to student placement and employment opportunities.

# **Manchester Metropolitan University: Artificial intelligence innovation collaboration helps The Insights People expand internationally**

The Insights People launched from Manchester Met's incubator, Innospace, in 2017. They are a global leader in kids, parents and family market intelligence. They survey more than 5,000 children every week, across five continents and 13 countries. Some of the world's best-known brands including Amazon, Crayola, F1, LEGO, Ofcom, Pokemon, SEGA, Turner and Warner Bros, utilise their market intelligence.

Working in collaboration with our SME Programmes team, an opportunity was identified to kick start innovation around data science to help The Insights People extract greater intelligence from their customer data.

## **The projects**

The Insights People benefited from a HEIF-funded innovation programme with the GC Business Growth Hub (BGH), to engage in a consultancy project with Dr Anthony Kleerekoper, who shared best practice and techniques in areas such as statistical weighting methods, natural language processing methods, data visualisation and unsupervised learning.

The success of this initial pump-priming project, then led to a successful joint application for a cross-disciplinary KTP involving academics from our Advanced Computational Science and Health, Psychology and Communities research centres, led by Prof. Keeley Crockett.

The three-year KTP, which started in 2020, is helping The Insights People to find innovative ways in which artificial intelligence can be used in the market research products (customer profiling tools.), introduce new processes to extract greater intelligence from their customer data and build consumer profiles and predict future consumer trends on behalf of their clients.

## **Use of HEIF funding**

Innospace, Manchester Met's incubator, where The Insights People launched their business in 2017 utilises HEIF funding to support business start-up bootcamps, innovation masterclasses and networking activity, designed to encourage businesses to start and growth.

The company's initial consultancy project benefited from the HEIF-funded BGH innovation programme, which gave the company access to an innovation development manager and an innovation voucher applied to the costs of delivering the project, which includes buying out academic staff time and other related project delivery costs.

HEIF funding also supports the salaries of business engagement staff (SME Programmes, Business Development and KTP teams) who supported both projects end to end.

## **Benefits achieved**

The benefits to The Insights People align to various government priorities such as:

- Enhancing regional growth and productivity – Innospace supported the company to start, innovate and scale. Since lockdown, the company has hired 20 additional staff and expanded internationally into Indonesia, Japan, the Philippines, and South Korea.

- Economic recovery – Not only did the company grow and expand internationally during the pandemic, but they also attracted £0.5m of Angel investment. Supporting SME innovation, growth and expansion, should have a positive effect on economic recovery and in this case may have a positive spill over effect to their clients and supply chain.
- Opportunities for students – The Insights People have accessed Manchester Met Graduate Talent throughout their collaboration with the University.

Nick Richardson, Founder and CEO of The Insights People said: “We’re fortunate to be doing something that is helping other businesses through this complex time.”

## **Nottingham Trent University: NTU social scientists contribute to the C19 National Foresight Group on policy issues**

Dr Rowena Hill, in the School of Sciences, is a specialist in emergency and disaster management systems. Dr Hill was asked to sit on a new cross-governmental national expert group to explore and support the government and other agencies to tackle the COVID-19 pandemic. Her role, as National Collaborative Lead oThe work of the NTU team comprised reports, often requested with a rapid turnaround, and academic foresight briefing the Group, was supported through HEIF and brought relevant academic discussions and ideas to the forum in ways that can be actioned in a rapid timeframe and delivered over the short, medium and long-term.

Dr Hill was supported by HEIF to head up a dedicated team of NTU staff to contribute to the C19 National Foresight Group which drew upon additional senior academic support from within the Psychology Team. Collectively, they have brought insights to shape and evidence discussions assisting the wider community to consider and develop informed responses to social issues arising from the Covid-19 crisis, including homelessness, domestic violence and mental wellbeing.

The work of the NTU team comprised reports, often requested with a rapid turnaround, and academic foresight briefing papers which included reviews of academic and policy literature and social trends datasets. These have been shared with national and local government and within each of the 38 Local Resilience Forums. One example was a rapid request to forecast the global supply of PPE, which was delivered in 48 hours and was highly praised by NHS England.

The Foresight Group also facilitated a number of roundtables and focus groups with key strategic leaders on topics such as, the development of a new recovery framework and supporting mental health. Dr Hill provided analysis of these roundtables which subsequently informed Government thinking and policy interventions.

A key priority of the National Foresight Group was to create a new mechanism to enable Local Resilience Forums, Local Authorities and recovery cells to share good practice. This has been facilitated by the creation of a bespoke app, developed by the NTU team, to enable Local Resilience Forums with similar demographics to connect.

Chairman of C19 National Foresight Group, Shaun West, commented: "The NTU team is critical to the foresight ambition entrusted in me and the C19 National Foresight Group to save lives, relieve suffering and support local communities across the United Kingdom. The research, reach, rigour and experience of which I am to avail myself via the collaboration with NTU is exemplary, setting the bar as to how universities can play such an influential role in emergency at every stage, from response through to recovery. I commend their work and dedication in such uncharted territory. Thank you for your life-changing contribution and consummate professionalism."

# Nottingham Trent University: Universities for Nottingham – the UK’s first civic agreement, supporting economic recovery and growth

The two universities in Nottingham make a significant contribution to the local and national economy. In partnership with Nottingham City Council, Nottinghamshire County Council, the D2N2 Local Enterprise Partnership and local healthcare providers, a Civic Agreement was signed in 2020 which identified key areas for collaborative action and development.

The Universities for Nottingham programme receives significant support from NTU staff within the HEIF-funded Knowledge Exchange and NTU Enterprise teams.

In the early stage of the partnership, areas of complementarity were mapped across the two universities and over 400 hours of conversation were held between 150 local stakeholders and colleagues. The resulting [Universities for Nottingham Civic Agreement](#) sets out a 14-point action plan to make a difference to local educational opportunity, economic prosperity, health and wellbeing and the environmental sustainability of our local communities.

The strategy for the Universities for Nottingham partnership is steered by the two university Vice Chancellors, the Chief Executives and Leaders of the City Council, the Chief Executive and Chair of the D2N2 Local Enterprise Partnership and Chief Executives of local health authorities who meet bi-annually.

The delivery of the Civic Agreement is overseen by a Project Management Board chaired by the Deputy Vice-Chancellors of the universities and senior thematic leads.

Notable success and activities to date include:

- **Clinical skills needs across the local healthcare system**

It is a local priority to increase the numbers of trained nurses. Both universities have met with the hospital trusts and the Integrated Care System and are increasing the of student nursing places in this academic year, with further increases in numbers planned for the next academic year. As a direct result of our collaboration under UfN, both universities are now working together to coordinate activity around open days and placements. This is a genuinely new collaborative approach in this field and is being well received by our partners.

- **Joint MedTech offer to business**

A joint UfN working group continues to progress this shared agenda. Actions include the publication of a joint, industry-facing e-brochure advertising services and opportunities for collaboration between the universities and industrial partners. A cross-university virtual interest group has been initiated to develop thinking on joint activity in the MedTech sector and horizon-scanning for suitable funding and partnership opportunities. Later this year a Universities for Nottingham MedTech event will be held in collaboration with Midlands Innovation and the Midlands Engine.

- **Sustainable travel, transport and behaviour**

During Sustainability Action Week, the universities held 7 collaborative events to encourage staff, students and communities to adopt more sustainable ways of living and working. Both universities have jointly adopted the Green Rewards platform for staff and students. This rewards and incentivises positive behaviours and associated carbon savings by encouraging more sustainable

wellbeing and lifestyle choices. To date, 3,382 staff and students across both universities have signed up to the App and they have avoided 333,110.4kg of CO2 emissions through their choices and behaviours.



# Sheffield Hallam University: Helping SMEs in Sheffield City Region access innovation support

## The challenge

It is often the case that businesses have ambitions and plans which are unfulfilled. For many SMEs, the barriers to achieving their vision and growth include.

- Limited capacity and resources to focus on innovative projects.
- the element of risk associated with innovation and change,
- the uncertainty of return on investment
- gaps in knowledge and funding

These challenges present an opportunity for the Sheffield Innovation programme (SIP) to intervene.

## What we do

SIP can support SMEs in the Sheffield City Region as a means of 'pump-priming' and making larger projects happen. For example, SIP has been used successfully to provide additional expertise, resource and capacity to regional SMEs in their pursuit of innovation in products and services and leveraging additional support from agencies for example Innovate UK and programmes including Knowledge Transfer Partnerships (KTPs). SIP funding enables academic experts to work with an SME, undertake initial investigative or feasibility work to scope out the challenge, and to develop further funding applications.

## The results

By utilising SIP support, regional SMEs have been able to access additional resources and expertise enabling them to realise their innovation focused objectives.

One example is Sheffield based SME, Highlander Computing Solutions. The company wanted to develop new software applications and modules for integration into Enterprise Resource Planning (ERP) systems. SIP supported senior academics in Business Information Systems and Technology at Sheffield Hallam University, who were able to help the company clarify its strategic vision and develop a successful KTP funding application which over a 27 month period enabled the company to innovate and develop new products and services. "The SIP support was invaluable" said Highlander MD Steven Brown, "it meant we could commit to the KTP application with confidence knowing that we had the help we needed."

Equi-Trek Limited is another regional SME for whom SIP has been instrumental in helping deliver a larger innovation project. Through SIP, a successful KTP funding application for a two-year project was developed, which has resulted in the introduction of new manufacturing/design methods and the launch of several new processes and products including an innovative motorised horsebox for the North American market. Equi-Trek MD Tom Janion said "this has been a great project for us, made possible by the support we received through SIP to get the funding application to the right standard."

HEIF support has enabled the University to provide match funding for the ESIF funded SIP project and contributes core funding to the KTP Development team. Since its start in August 2016, SHU has provided innovation-based support to over 300 regional SMEs, involving 130 staff from a broad range of research groups. The work has contributed to the development of 69 new products, 43 of which were introduced to

the market. The HEIF funding has also helped achieve 24 KTP projects with 23 Companies. 10 large, 13 SMEs (7 in SCR). The KTP projects have been supported by 38 academics from across all 4 Research Institutes.

# Sheffield Hallam University: Capacity through crisis – understanding the role and contribution of the VCSE sector in Sheffield during the COVID-19 pandemic

## The challenge

The need to have a robust empirical understanding of the contribution of the Voluntary Community and Social Enterprise (VCSE) sector to the response to the COVID-19 pandemic and to aid policy development in support of social and economic recovery.

## What we did

The Voluntary Action Research Group (VARG) at Sheffield Hallam University (SHU) were awarded Higher Education Innovation Funding (HEIF) through the competitive Impact Fellow programme, to work with Voluntary Action Sheffield and partners across the city to understand the contribution VCSE sector made locally during the pandemic.

The aim of this project was to capture learning about how the VCSE sector has responded during the pandemic, how the pandemic is affecting their work, and to use this evidence to inform policy developments relating to the contribution of the sector.

The findings have been used to develop a framework for understanding the implications of the pandemic for the VCSE sector in Sheffield and how it can work collaboratively with stakeholders in the public and private sectors.

## Results

The research identified how the sector responded quickly and effectively through informal neighbourhood activity, formal community level support hubs and city level coordination.

The most active areas included: food supply; physical and mental health; social isolation; domestic violence. A 'resilience' framework was developed to explain the response in more detail and how the VCSE could be involved in social and economic recovery. **Absorptive capacity** meant that VCSEs responded effectively to the 'shock' of lockdown by working out how to provide support under the new restrictions; **adaptive capacity** enabled VCSEs to adjust their provision as the pandemic progressed through different waves and saw them develop innovative ways to provide support as new needs emerged; **transformative capacity** will be needed for a social and economic recovery that enables the city 'build back better'.

The research was published in a report "[Capacity through crisis - The Role and Contribution of the VCSE Sector in Sheffield During the COVID-19 Pandemic](#)". Author(s): Chris Dayson Abi Woodward 2021, which concluded that the VCSE sector, working with the public sector could play a transformative role in the post-Covid-19 recovery of the city if challenges including funding, sustainability could be addressed. The team is currently working with the Sheffield Partnership Board – a city leadership forum chaired by The Rt Hon. the Lord Blunkett - to support the development of a multi-sector response to VCSE capacity and resilience.

## Wider impact

In addition to locally focused research in Leeds and Sheffield, the VAR team has also collaborated with HEI partners (Nottingham Trent University, Open University, Wolverhampton University) and VCSE

organisations such as the National Council for Voluntary Organisations and the Centre for Ageing Better, on three national projects exploring the impact of the pandemic on the VCSE sector.

The work is also contributing to the SHU's Advanced Well-Being Research Centre's [RICOVR](#) unit, which developing a programme of community engagement to address health inequalities and physical and mental recovery from the Covid 19 pandemic.

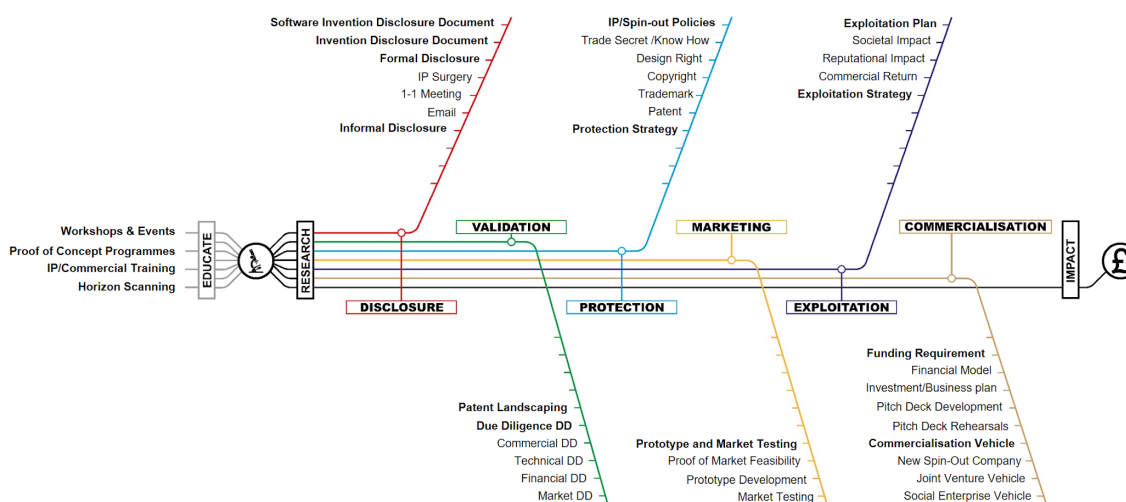
# University of Central Lancashire: Capturing value from intangible assets

For UCLan to fulfil its role in the regional and national ecosystem it recognises that it needs to support its academic staff and students in the dissemination and exploitation of their knowledge, technologies and ideas in order to provide practical solutions to challenges and problems in the modern world.

Significant progress is being made in the development of a wide-ranging portfolio of Intellectual Property Rights, in the form of Patents, Designs, Copyright, Trademarks and know-how across Biomedical Sciences, Engineering, Forensic Sciences, Health and Medical sciences, Nuclear Sciences, Nano-Materials, Pharmacy and 3D Printing Technologies to name but a few.

Our approach involving a range of activities and support are mapped to an Innovation Roadmap (see figure 1) taking researchers' ideas and inventions from conception to impact. This requires academics to have a greater understanding of the IP and commercial issues surrounding knowledge transfer.

**Figure 1 – Innovation Roadmap:**



To this end, UCLan's IP & Commercialisation (IPC) unit continues to develop novel on and offline mechanisms, programmes, training and tools that places increasing emphasis on protecting and exploiting the University's intangible assets to help progress ideas and discoveries from the lab/classroom to the marketplace.

In addition to managing UCLan's IP portfolio, the IPC unit offer academic staff numerous development courses including several educational programs on IP and commercialisation as well as innovation surgeries and events with external parties such as InnovateUK.

An example of a mechanism for disseminating UCLan's IP for exploitation by third parties is via its newly launched Licensing Portal (<https://uclanip.co.uk/>). The portal's purpose is to facilitate the promotion, dissemination, distribution and licensing of research and knowledge exchange outputs produced by UCLan academic staff via an online repository, open to the public.

Academic staff are invited to submit their research outputs to the licensing portal so that interested parties can see an overview of the research and discuss licensing the asset.

The IPC unit have developed a suite of flexible licenses the user can sign up to depending on how they wish to exploit the asset. These include:

- Non-commercial/ Academic License - This license can be entered into and the asset downloaded immediately from the portal
- Commercial License
- Evaluation License
- Start-up License

The Portal has been designed to detail all the IP that the university has that is available to license. This IP may be in the form of Patents, Design Rights, Copyright, Trademarks, or know-how.

Not only will the portal promote University of Central Lancashire's creativity, but it also:

- Showcases the exploitation opportunities that different IP assets can provide to the potential licensees.
- Streamlines the process of licensing ideas and inventions to 3<sup>rd</sup> parties quickly and safely.
- Enables tracking of the impact of the IPC activity within the University.
- Enables researchers to access licensees on how they are using the know-how, which could lead to future possibilities.

# University of Central Lancashire: Digital twinning capabilities – Granite House

Digital twinning is the process of capturing an environment and replicating it in a digital, 3D platform. We have worked with a number of factories to create digital twins of their premises. These have been used to visualise manufacturing workflows, plan the movement of large/heavy machinery and implement social distancing guidelines. One of our clients moved premises during the first lockdown by scanning their new building and their existing machinery and planned out the best locations for each workstation digitally.

Replicating the building structure in the virtual 3D environment was the first step. If a digital plan of the building is available, this can be imported into our engine and worked with directly. A point cloud can be used if a BIM file is not available. Real world factors such as the date, time and location available, meaning that accurate lighting and weather can be replicated in the virtual environment.

From BIM files a data preparation process followed which removes any unnecessary features from the model to increase the performance. The balance of accuracy to performance can be stated by the client. The data-prep process also ensures the model is accurate in size and orientation. Once the model has been imported into the virtual environment, internal features can be added.

Using a LIDAR scanner, multiple scans are taken. When processed, a 3D point cloud is generated, representing the geometry of the internal structure. Depending on the scanner used, these can also include colour data to help make the environment more recognisable. The scanners are accurate to  $\pm 2\text{mm}$  at a distance of 20m. Multiple scans from different locations are used to capture the entire environment and ensure the accuracy of the final point cloud.

Internal features such as wiring, lighting, pipes, machinery and furniture can be added, as well as visual clutter. Photorealistic models can be used where available. If models are not available, as is often the case with specialised machinery, scans can be taken to create an accurate 3D representation of the object.

## Application tools and features

Tools are available to improve the digital twin experience:

- Multi Tool – manipulates objects in 3D space: rotation, transformation and scale
- Path Tool – creates wiring, walkways, drainage, piping, partitions, fences etc.
- Measurement – take accurate measurements in the virtual environment
- Walk Area – the walkable area in the environment, visualised. This factors in safe areas around machinery
- Import – External 3D models imported into the application.

The application can also be viewed in Virtual Reality (VR), creating a truly immersive experience. The VR experience can be used for training, inductions or to show restricted / dangerous area.

## Benefits of digital twinning

- Create an exact replica of a physical environment.
- Plan workspace without the disruption and costs involved in moving heavy plant and machinery in error.

- Plan workflow remotely with participants in multiple locations
- Can be viewed in VR headsets for a more realistic experience.

Granite House, one of our ERDF clients, saved thousands of pounds and numerous planning hours, when they moved to their new factory location in Preston. This involved a 4 hour virtual meeting with company staff and their plant relocation team. After exploring a number of configurations the whole factory was designed and laid out exactly to their requirements. This is more remarkable as this was achieved during lockdown and the physical relocation work commenced the next day.



## University of Greenwich: Fostering informal social networks in online working

The pandemic forced virtually all businesses and organisations to radically reconfigure their working practices, most developing hybrid combinations of online and offline practices. The continuation of the pandemic and the learning from this reconfiguration suggests these hybrid work practices will remain in place for a long time. A critical component of competitive advantage in advanced organisations is the ability to innovate, the 'exploration' capability. This is importantly fostered by unstructured, serendipitous, informal social interaction, 'water cooler' time. Informal social networks are also important contributors to effective onboarding, motivation and retention of staff in general. The move online has greatly disrupted these processes, with online tools proving poor substitutes for face-to-face 'hanging out'. This may be especially true for women who disproportionately bear the responsibility of caring for others and as a result may experience a reduced ability to join from home technology mediated substitutes for face-to-face 'hanging out'. These limitations are likely to become an increasing impediment where physical interaction remains highly constrained.

Supported through our Innovation Fund – this project aimed to understand how hybrid working models were being developed and used in local organisations. The team interviewed key informants to understand the particular hybrid mix of online and offline work practices adopted by this organisation during the pandemic. Follow-on surveying of the workforce, using in-house software, to map the social networks underpinning formal work tasks and informal social relationships will gather qualitative evaluations of those aspects of the adopted work practices in aiding or hindering the formal and informal relationships.

This analysis will develop recommendations for improving the hybrid model and a second round of data collection will assess the operational effectiveness of the modified model, allowing the project team to promote the adoption of effective hybrid working models and feed into those businesses adopting more effective hybrid working models.

Ongoing societal and economic benefit will be delivered through the project. One problem highlighted by the team was the disproportional impact of Covid and home working on women and those with caring responsibilities. By supporting businesses to adopt supportive and engaging working models it supports more economic activity from a diverse workforce and therefore allowing those at risk of falling away from the jobs market to continue within a more flexible and technology enabled business. The optimised hybrid working model could also allow companies to achieve business efficiencies and therefore improved competitiveness and potentially increased profitability.

The project supports priorities for addressing the Covid crisis and recovery. It underscores how the university plays a role as an anchor in the communities it operates in by working with local businesses to address an issue that resulted from the Covid crisis. The issue will however, be an ongoing challenge as work forces become more mobile and businesses seek to reduce environmental impact by supporting remote working. The university is committed to supporting the economy around it, to help it face challenges, innovate and grow, thereby assisting in regeneration of the local economy and in turn creating highly skilled jobs.

# University of Hertfordshire: Hertfordshire Science Partnership

The Hertfordshire Science Partnership is a unique collaboration between the University of Hertfordshire (Herts) and Hertfordshire Local Enterprise Partnership (LEP), co-funded by the European Regional Development Fund (ERDF).

Herts secured a £2.5m capital/revenue swap from the Local Growth Deal Fund as part of the construction of Herts' £50m Science Building – aligned to the LEP's Strategic Economic Policy (SEP). This was augmented by £1.5m of funding from ERDF to support SMEs in the local region. With business co-investment and Herts' in-kind investment in the project, through HEIF-funded staff (KE and academic/research staff), the total value of the project is around £6.2m.

The Partnership was formulated to create a translational Doctoral Training Centre focussing on Hertfordshire's regional strength in the Agri-Tech and Pharmaceutical sectors. Key to the project's success is the engagement with SMEs within the region who benefit from subsidised collaborative research and access to state-of-the-art facilities and academic expertise at the University. In 2020, HSP was finalist as KE Initiative of the Year for the THES awards.

## Unique delivery method

The flagship delivery mechanism for HSP is the Hertfordshire Knowledge Exchange Partnership (HKEP). Each HKEP is designed to enable a business to establish new capabilities, proof-of-concept for new products/services or expand the business' capacity and market.

With Knowledge Exchange values at its core, this type of project is unique within the sector due to its 1+3-year structure: in year 1 the post-graduate researcher (Associate) is recruited and placed directly into the company's premises undertaking a commercially focused project. This is a hugely attractive part of the scheme from the business' viewpoint because they can begin to develop the Associate to meet the ethos and standards of the business from day one. Upon completion of year 1 the Associate returns to Herts to complete a 3-year research project, which is of strategic importance to the business.

## Delivering impact

HSP focuses on Smart Specialisation in the Hertfordshire LEP area, specifically by:

- strengthening the local innovation ecosystem and building capability
- supporting local supply chains to invest and collaborate
- branding and positioning Hertfordshire as a credible centre of smart specialisation

The Partnership is expected to facilitate over 20 knowledge exchange partnerships by 2022 and will result in 20 collaborative PhD projects with innovative regional businesses seeing impact in the following ways:

- Applied research projects leading to the introduction of new products or services
- Consultancy from a Herts Academic throughout
- New graduate talent working within the business during year 1
- Access to new research ahead of market which is embedded in the company
- Access to specialist research facilities at Herts for the duration of the HKEP project

Overall, our HEIF investment in HSP alongside leveraged funding has contributed towards the UK government's net zero and skills priorities, the key foundations of the Industrial Strategy around "Ideas", "People" and their role in supporting "Place" and support of the vital role of students in delivering

knowledge exchange, as well as benefitting students themselves through enhanced employability prospects.

## University of Hertfordshire: All-campus incubator

Many start-ups, particularly digital and hi-tech, have moved away from classic, capital intensive offices toward using 'co-working' spaces. These developments closely mirrored the introduction of connected, open, cooperative meeting spaces within our campus. In line with the Hertfordshire's SEP priority 4 'Foundations for Growth', in 2018 we secured £668k ERDF match funding to open our campus facilities as an ['open incubator'](#) to Hertfordshire entrepreneurs.

Following research at the University ([Culkin, 2016](#)) the project built on Herts' track record of supporting start-ups and offering employability support for students and entrepreneurs. It focussed on enterprise development and growth and targeted the pre-start, start-up, and scale-up business community in the local region, with the twin aims of (a) enhancing start-up and early-stage business survival rates and (b) improving the skills of entrepreneurs and increasing graduate retention in Hertfordshire.

Specifically, the project sought to address a lack of workspace and incubator-style support, geographical isolation faced by start-up businesses, and ultimately, low survival rates of start-ups in Hertfordshire. The University was well placed to provide services to businesses in Hertfordshire as it has one of the only large campus facilities in the LEP that can facilitate sector-agnostic incubator support to SMEs. These activities are centred around Herts new dedicated Enterprise Hub which has a dedicated business incubation area.

By offering businesses a unique mix of resources, inspiration and collaboration opportunities, Herts has created an entrepreneurial ecosystem designed to connect and support innovative entrepreneurs, who can in turn feed off each other's ideas to drive their ventures forward. Members can make use of a dynamic open working environment and have direct access to workshops, practical 1:2:1 support from Herts staff, access to technical expertise and networking opportunities. Moreover, incubator businesses sit alongside, and share best practice with, our students, graduates and staff fostering a dynamic two-way knowledge exchange.

In addition to the outcomes and impacts in the table below, an independent assessment of the ERDF project calculated that *"the estimated impact of the project is a Net Present Value (NPV) Gross Value Added (GVA) of £3.3m over the next three years. The estimated NPV GVA of £3.3m has resulted in a cost-benefit ratio of 1:3.9 (that is, each £1.00 of public investment has generated £3.90). The total project cost per business assisted is £8,727 and the cost per job is £17,333 both at the lower end of what might be expected for this kind of activity."*

In line with our HEIF 2016-21 strategy and [Herts Strategic Plan 2020-25](#), the Incubator is now part of our mainstream work at the University ([University Enterprise Zone](#)), and we will continue to evolve a supportive community of entrepreneurs for the county and wider region.

Initiative	Period	Investment	Outcomes	Impacts
All Campus Incubator	2017 - 2020	ERDF £680k Herts LEP £2.5M	104 enterprises receiving support	4 new jobs created 28 New to the market products
		UH £680k Garfield Weston Foundation £150k	61 start-ups received financial support	129 Entrepreneurs assisted to be enterprise ready

## University of Huddersfield: Paxman Scalp Cooling Research Centre

Huddersfield-based business [Paxman Coolers](#), a pioneering technology company dedicated to eliminating hair loss during cancer chemotherapy treatment, and the University of Huddersfield have recently signed a five-year research and collaboration agreement covering the Paxman Scalp Cooling Research Centre, a multidisciplinary centre undertaking fundamental and applied research across key aspects of scalp cooling, based at the University. The Centre focuses on biological hair follicle research as well as developing innovative scalp cooling-related treatments and equipment including individual 3D-printed cooling caps.

The relationship began in 2011 and initial collaborative research exploring the biological basis of follicle protection primed using HEIF funding. From these origins, the relationship evolved in terms of value to both parties and disciplinary spread with key academic expertise in product design driving the development of improvements in cap design. The collaboration has developed underpinning evidence on how scalp cooling can protect from chemotherapy treatments, leading to new approaches to achieve the target of zero hair loss.

The partnership has supported various aspects of University activity, ranging from student employment opportunities to research collaboration and impact demonstration through commercialisation of collaborative research findings. Funding has been secured through various routes – initially through HEIF seed funding, through to KTPs, SMART awards and direct contract research funded by the Paxman.

The quality and impact of the relationship has been recognised through various routes and HE sector / industry awards.

## University of Huddersfield: Simplifai Systems Limited

[Simplifai Systems Limited](#) was born from AI research development from the School of Computing and Engineering's Professor Lee McCluskey, chair of software engineering. Following disclosure, a meeting was initiated by Research and Enterprise with transport expert Keith McCabe, who was writing an industry handbook (global future of transport technology). The two got talking. Both shared a frustration about the current state of transport technology and Lee described the work he'd been doing using a niche form of artificial intelligence to solve traffic problems. The same technology used to move unmanned vehicles across the surface of Mars!

A collection of individuals who thought they could solve the apparently 'unsolvable' problem of traffic congestion began working together. In 2014, the first tentative steps were made. Working with the University and initially seed funded through HEIF, the conceptual design for Simplifai was produced. An Innovate UK competition was won in 2016 to take the design and prove it on a very small scale. In 2017 a contract was won with Innovate UK to build a prototype - a First of a Kind project as part of the UK government industrial strategy, working with Transport for Greater Manchester (GMT). Simplifai was formed. The early-stage version of the product was built and the project was a success. Convention was challenged and the 'impossible' achieved. AI can successfully and flexibly control traffic systems.

Simplifai solves the following common traffic problems:

1. Relieving routine or unexpected congestion
2. Rapidly moving people to and from major events such as concerts or sports matches
3. Reducing air pollution or redistributing it to areas where it causes less human harm
4. Maintaining effective traffic flow around roadworks or traffic incidents
5. Getting people home safely in advance of inclement weather
6. Evacuating a city in an emergency

Through initial seed-funding using HEIF, and supported throughout by our HEIF-funded IP & Commercialisation Manager, the University is now a partner in Simplifai Systems Ltd destined to make a positive impact in reducing congestion and improving air quality across the world's town and cities.

## University of Lincoln: Recovery and recycling of rare metals

Several rare metals important in the production of super alloys and components for a range of industrial sectors are particularly scarce, difficult to mine or recycle. Traditional methods do not offer a full solution for their extraction and recycling. In response, research at the University of Lincoln has developed innovative extraction methodologies, leading to improved industrial processes to extract rare metals from petroleum ash. By improving process technology for GSA environmental Ltd (GSAe), this has enhanced GSAe's commercial portfolio and overseas investment.

GSAe, a local company, completed two KTPs with the University of Lincoln between 2015-2019, were awarded a grant through the University's European Structural Investment Fund (ESIF) supported Productivity Programme, and opened up a second workspace by becoming tenants of the Lincoln Science and Innovation Park, based on the University campus. A £10k HEIF Innovation Fellowship supported a research assistant to support the work.

The internal posts in Research and Enterprise supporting the KTPs and additional activity surrounding the commercial and IP potential were fully funded through HEIF. The University's outsourced IP Services provider, fully funded through HEIF, provided advice and support to project, the lead academic and the R&E department.

As a result of Lincoln's research, GSAe report increased knowledge of the environmental impact of their source material, increased targeted client base, a more hybrid solution available to more clients with lower concentration of contamination, and reduced energy and water usage by up to 50%. GSAe described the new processes as 'paramount' in delivering a project focused on optimising processes for Petroleum de Venezuela SA (PDVSA), the Venezuelan State Oil Company.

GSAe have also been enabled to extend their commercial portfolio and business activities in metal extraction, including significant overseas investment.

The polymer developed can recover vanadium with sufficient purity to be used in a new generation of rechargeable batteries - key to new technology for energy storage from renewable sources - opening up new commercial options for GSAe. PDVSA reported capital cost reduction of 30%, valued at USD10m and increased vanadium recovery from <45% to >90% (valued at USD5m USD per Annum per project) and nickel purity from 60% to >90%, equivalent to a doubling in value (USD4m per annum per project).

GSAe own the resulting IP and is considering patenting and evaluating its industrial and economic potential in the case of vanadium. This technology will be used and adapted to extract other valuable metals, such as scandium also in collaboration with the University of Lincoln.

This has aligned directly with the Government's place based R&D, levelling up and innovation agendas - given GSAe's location in North Lincolnshire which had declining productivity from 2010-18 and is one of the lowest-ranked NUTS2 subregions with a productivity rate at least 15% below the UK average (ONS, Subregional productivity in the UK: February 2020). Knowledge Exchange has provided developments and benefits for both. The KTP resulted in a 60% reduction in water consumption for the recovery process, in line with net zero ambitions.

## University of Lincoln: Graduate start-up services

HEIF allocation has been used to support the University of Lincoln's commitment to growing graduate start-ups in Greater Lincolnshire, through various engagement activities, development programmes and grants.

Our Student Enterprise Co-ordinator role is funded by HEIF. This post is responsible for embedding self-employment and freelancing within the University's Careers curriculum, raising the awareness of both as viable and promising career options. The Co-ordinator also manages the organisation and delivery of a series of workshops, start-up bootcamps and mentorship schemes through the University's Student Enterprise Service (for University of Lincoln students) and Growing Graduate Enterprise programme (for graduates in the Greater Lincolnshire area). Between August 2019 and August 2020, 48 workshops of this kind were facilitated, with over 400 students in attendance. Additionally, students and graduates can receive up to 12-hours of business support from the Co-ordinator and local entrepreneurs who possess proven track records of running successful businesses.

HEIF has also provided a grants of up to £2,000.00 to support graduates across the Greater Lincolnshire area who require financial support due to the impact of COVID-19 on their business. The grant scheme is ongoing and so far, benefiting graduate start-ups have included a branding agency, a tuition company and an animation studio.

These grant funding and development programmes have given students and graduates a route to self-employment during a challenging time for graduate recruitment prospects. In line with OfS' objective to ensure all students, regardless of backgrounds, can live fulfilling lives with and successful employment, our focus on graduate start-ups aims to make self-employment an accessible career path to all University of Lincoln students and local graduates from other Universities.

Encouraging business start-ups is an important element for growth in the Greater Lincolnshire economy. Over the last decade the area has lagged behind the national average for business start-ups, only recently starting to close the gap. With support strategies such as this one, we would like build on this progress and respond to the recent effects of COVID-19 and the economic downturn.

Through the continuation of HEIF support, our graduate start-up services aim to improve graduate outcomes and career prospects, while supporting macro and small businesses to contribute further to the local, regional and national economies.



## University of Bedfordshire: Productivity improvement short courses

In late 2013 the University's newly appointed HEIF-funded Head of CPD and Short Courses, Eamonn Keenan, made a connection with the [Lean Six Sigma Company \(TLSSC\)](#), one of Europe's most successful business training providers, with the aim of bringing Lean Six Sigma expertise in lean thinking and business improvement to UK organisations. Growing interest in business improvement and quality management techniques among the University's existing short course clients had suggested a business need and commercial opportunity for knowledge exchange.

Over the following year, a close working relationship formed between the Netherlands-based provider and the University's HEIF-supported Innovation & Enterprise Service. A commercial contract was put in place, enabling the UK franchise of TLSSC Ltd. to be added to the University's portfolio of business training and CPD. The first cohort began in 2014.

Growing steadily, the initiative is a highly sought-after training programme for a variety of large organisations in the manufacturing industry and beyond. The value of LSS derives from the combination of lean thinking – identifying and eliminating avoidable sources of inefficiency in organisational practice and processes - and their attention to detail on techniques and quality assurance and improvement. The combination promotes a careful balancing of unit cost reduction against quality measures and improvement.

Through a solid marketing and promotional campaign, the university appeals to clients wishing to enrol or enter a contract for services.

TLSSC staff help provide expert pre-enrolment advice on the UK-wide and online programme.

Specialist staff, known as Master Black Belts, teach to the ISO standards defined for Lean Six Sigma Black Belt and Green Belt, delivering up to eight open enrolment cohorts per annum as well as providing in-house tailored training for our corporate clients. Courses also facilitate a strategic business improvement project for their organisation by providing expert supervision and support to enable successful learners.

2017 saw the growing success of the TLSSC programme with course leaders dedicated to responding to UK demand for productivity initiatives. With the support of HEIF funding, the overall Continued Professional Development offering and this particular programme, the university has seen more interest and focus from larger organisations who are looking for organisational level improvements in productivity at senior executives level.

Since 2017, tailored in-company training has grown significantly and now makes up around one third of collaborative activity across the region. Joint clients have included major household names in the private and public sectors.

# University of Portsmouth: Small Business Leadership Programme

In 2020, The University of Portsmouth's Business School joined forces with the Chartered Association of Business Schools and Aston Business School to conceive, design and deliver the Small Business Leadership Programme. This programme was in direct response to a request from HM Government (principally the Department for Business, Energy and Industrial Strategy to support SMEs during and post-pandemic).

The basis for the intervention was research undertaken by key business schools across the UK between March and June 2020 reviewing the state of SME businesses and their anticipated needs (see University of Portsmouth report "Bouncing Forward" researched and written by the Business Resilience, Innovative Development, Growth and Entrepreneurship research group). This research showed for the first time that SMEs had identified clear gaps in business resilience in infrastructure, finance, growth and strategy.

Building on this research, the Small Business Leadership Programme was developed in two months and rolled out online to SMEs in August 2020. Delivery was asynchronous across England, with 18 other business schools coming onboard to deliver the training and support interventions.

Over 2,300 businesses participated in the programme between August 2020 and March 2021 with Portsmouth delivering 10% of that target. Following the March statement from HM Treasury it was announced that the programme would receive further funding, enabling it to expand to include the entire UK and reach 10,000 SME leaders over three years.

Our HEIF funded staff, principally the Director of Business Development and the Small Business Manager were fundamental in providing the driving force to make this happen and linking key academics such as Professor David Pickernell in the design and delivery of the programme. Portsmouth took the lead role in developing the pre-programme diagnostic to ensure the creation of both research and programme impact data.

This project is indicative of the range of support that the University provides for the small businesses that form a critical element of the economic base of the region. Recognising the local need, supporting this sector is a strategic imperative of the University. The Business School has held the Small Business Charter Award since 2015, and in 2021 was awarded the accreditation for a further 5 years. The award requires evidence of expertise, activity and impact in 3 key areas:

- Support for the growth of small businesses
- Stakeholder engagement to support growth in the region
- Encouraging student enterprise and entrepreneurship.

Other examples of activity highlighted are our Entrepreneurs-in Residence Programme – a team of more than 30 highly experienced individuals who provide mentoring, advice, guidance, networking and support to students, staff and members of our Innovation Connect Community.

[Innovation Connect](#) is our business incubation community and provides a variety of office spaces for companies at different stages of growth, from pre-start to mature, with a purpose to help each business grow.

Focussed around our current portfolio of physical centres (currently hosting 96 companies and upwards of 250 employees), this growth is supported through improving access to university expertise (staff, student and facilities), networking, training and access to finance.

## University of Portsmouth: Innovation for clean growth

HEIF investment in staff time, brokering relationships, events and project development contributed significantly to the creation of Greentech South in 2015. Partnership activity with regional business, local government and HEIs through a Regional Growth Fund green growth project demonstrated the demand for a triple-helix Cleantech cluster within the region that could support businesses aiming to reduce carbon emissions and create innovative low carbon technologies. This would not have happened without the HEIF investment, provided by the University of Portsmouth

Greentech South has grown to 400 members (mostly SMEs) and was the first Energy and Environment accredited cluster in the UK. It is also the only UK member of the International Cleantech Network, which supports and engages a global network of over 15,000 SMEs. This led to Greentech South and the University of Portsmouth becoming a founder hub of Clean Growth UK, a national platform to support businesses, particularly SMEs, in seeking to develop products and services that will accelerate our transition to a Net Zero, Clean Growth Economy funded through a £3.5m Research England CCF grant.

Civic universities like ours recognise the importance of working together with local authorities and business communities as critical agents for levelling up and in helping to build back better – and in this particular case including contributions to a post-Covid19 green recovery. In our first 2 ½ years, we worked collaboratively with businesses to deliver 191 research and development projects, all aimed at supporting our growing number of member businesses that are innovating new products and solutions for Clean Growth. We raised an additional £10M in income, which leveraged over £40M of further investment into the growing Clean Growth economy, supporting the Government's objective of increased investment into R&D to 2.4% GDP. This activity has already safeguarded or created 259 jobs over a 2-year period, with more to come.

In addition, that initial investment and continued support from HEIF has led to a regional (around Portsmouth) impact that has secured over £15m to support the transition to a zero-carbon economy. With over £55m inward investment, 300+ jobs safeguarded or created and over 400 businesses helped. Some of this is through the European Regional Development projects that we have also secured building on this activity, representing a total project value of over £4M to support low carbon activities.

Examples of the many companies we have helped include:

- **Warrens Office**, a contract office supplies company based in Winchester.

“Going through the energy efficiency audit and making commitments following the audit to improve our businesses environmental credentials has probably been the single most important thing we have done in the last 12 months.”

- **Airhead**, a start-up creating a revolutionary anti-pollution mask for urban commuters, to encourage sustainable travel. Airhead were awarded a £25,000 R&D grant to help them bring their anti-pollution mask to market. Based on Airhead's projected market size and sales figures, by year one the project will have helped save 107 tonnes of CO<sub>2</sub> emissions, rising to 3,441 tonnes by year five.

“We're thrilled to have been awarded an EMphasis3 grant; it's been a great boost for the business. The team were a brilliant support throughout and we're very grateful to them for all of their help.”

## University of Salford: Healthy Active Cities

[Healthy Active Cities](#) is a programme of research and engagement activity focused on sustainable and active travel, principally walking, cycling and new forms of sharing through app-based platforms. HEIF funding has enabled the team to leverage additional money from Transport for Greater Manchester (TfGM) and to employ a researcher working across the two organisations and solidifying a relationship through which research is shaped so as to have a direct path to impact and, in particular, to directly inform the development of Greater Manchester's Bee Network of walking and cycling infrastructure. The [project on Low Traffic Neighbourhoods](#), centred around in-depth qualitative research with residents in neighbourhoods where active travel has been enabled through physical changes, will be adding value to a nascent evidence base on experimental urbanism in the UK and directly informing policy in Greater Manchester.

The '[Sustainable Transport Futures](#)' seminar series has run 18 events over the three-year HEIF project and has helped to position the University as a leader in active and sustainable mobility research. Covering a range of topics including air quality, social inclusion, mobility as a service, self-driving cars, school streets and cargo bikes, the events have attracted an audience from research, policy and practice, including local authorities, business and the voluntary and community sector, and featured presenters from across these sectors. During Covid-19 lock down, online events have attracted an audience from beyond Greater Manchester.

The team includes researchers at the University who are associate with Healthy Active Cities but not directly employed by HEIF funding. The team regularly contributes towards external events with partners such as the Royal Town Planning Institute, the Active Travel Academy, and the festival of road safety, further raising our profile. Dr Graeme Sherriff was an invited expert at the UK Government [Transport Select Committee enquiry into e-scooters](#). They have continued to publish academic research, including articles on [bike share](#), [micromobility](#), [walking in tourism](#), the [changing geographies of exercise during Covid-19](#), [active travel](#), and [e-scooters](#).

HEIF funding has facilitated investigation of sustainable travel on campus, in particular an ongoing study of e-bike hire for staff that has been developed in partnership with Manchester Bike Hire.

Alongside the activities directly funded by HEIF, the standing of the Healthy Active Cities team has helped to make possible other funded projects. A study of [e-cargo bikes](#) was funded by EPSRC and completed in December 2020. An ongoing relationship with TfGM and Lime has resulted in a project involving detailed social research on the Salford scheme that forms part of the Government's national trials on [e-scooters](#), work that will feed directly into the development of GM and national policy.

# University of Salford: Institute of Acoustic Metrology

In 2016 the [National Physical Laboratory](#) (NPL) underwent a major re-organisation and closed some areas of activity to enable a greater focus on new and emerging technical fields. One of the areas that closed was airborne acoustics, including all research activity and calibration services.

However, acoustics is a significant UK sector, contributing >£4.6bn to the economy each year, and supporting more than 16,000 jobs, making it equivalent to the 20<sup>th</sup> largest sector. Microphones are used across many industry sectors including aerospace, satellite, automotive, construction and defence as well as creative industries and consumer products.

The withdrawal of NPL from airborne acoustics resulted in issues for UK industry. There was no longer an onshore route to traceability for essential microphone calibrations. The technical resource provided by NPL in research and bespoke testing was lost. The UK had no representation on international metrology committees for airborne acoustics.

This project has worked to fill this gap in airborne acoustics, using the University of Salford's status as a centre of excellence in acoustics to develop a service that could provide the support in acoustic metrology required by UK industry. The technical capacity of the existing Acoustic Calibration Laboratory at the University of Salford has been advanced to re-establish an institute that will be responsible for disseminating traceability for acoustics within the UK.

HEIF funding allowed the purchase of essential equipment required by the new advanced service and buy out of staff time from the Calibration Laboratory. A student placement was able to contribute, providing valuable student experience. HEIF also supported an application to the United Kingdom Accreditation Service (UKAS) to accredit the new service, providing critical evaluation.

Addressing National Strategy areas:

## **Skills**

The development of this service has allowed the retention of the excellent track record in acoustic metrology research developed at NPL by linking with ex-NPL scientists who have acted as consultants on this project. This means that this expertise has not been lost to UK industry, and has supported the skills development of the technical staff at the Acoustic Calibration Laboratory at the University.

## **Innovation**

The Institute of Acoustic Metrology offers a service that represents the highest level of calibration for UK acoustics. In addition, the service will support research into new primary calibration methods in acoustics by supporting a PhD in the field moving the field into the future.

## **Infrastructure**

The service provides infrastructure in the form of a Laboratory for the UK that is able to provide otherwise non-existent critical calibrations for other UK calibration laboratories, industrial partners, consultancies, education and the health sector.

## **Levelling up**

The laboratory has a North of England base (NPL was in Teddington) supporting the levelling up agenda.

## **Global Britain**

Acoustic Calibration at this level is available onshore after a break of 5 years and no longer has to be sourced from international laboratories. The service positions the laboratory to participate in future international technical committees for acoustic metrology that currently have no UK representation (and no UK voice when developing metrological strategy in the field).

## University of the West of England: Scale Up 4 Growth

Scale Up 4 Growth (S4G) is an innovative, £2.7m programme, designed by UWE Bristol's Research, Business and Innovation (RBI) team and funded by the European Regional Development Fund (ERDF). It is a 3-year, free programme of support for businesses in the West of England (WoE) that are looking to grow, expand and scale. The programme is delivered by the unique S4G Partnership of UWE Bristol, NatWest and Foot Anstey LLP. It includes:

- Business growth workshops
- Grants of £10k–40k for projects that address barriers to growth

S4G brings together the very best in university-business partnership working, sharing knowledge and expertise from academia and industry with growing businesses, to benefit the regional economy.

S4G is the result of a successful ERDF bid by RBI's Business Services team (roles funded by HEIF) to run a programme to enhance the competitiveness of SMEs. The Team leveraged its excellent partnerships with NatWest and Foot Anstey LLP, developed through the University's HEIF funded Business Fellows Programme and support for Tech Transfer.

Workshops are co-delivered by experts from the Partnership with HEIF underpinning the important contributions of a Professor in Knowledge Exchange (Leadership and Change) and a Senior Lecturer in Strategy (Supply Chains and Business Models) from UWE Bristol's Business School.

S4G has had significant impact on the regional economy, awarding £850,000 in grant funding (leveraging £1.2m private match) and creating over 150 jobs. RBI's Business Services Team supported companies to design and develop bids for the grant funding, delivering high quality, fundable projects.

*"Putting together the grant proposal was really interesting because it forced us to think about what was really important, what do we need to do, what were our top priorities?" **Shelby Temple, Azul Optics.***

The Project has created a network of high growth businesses, many of whom are engaged in follow-on KE activity with the University. This includes a Management Knowledge Transfer Partnership and student consultancy delivered through The Foundry (UWE Bristol's hub for digital consultancy projects). The KTP Team, and the Foundry, are both funded using HEIF.

*"The vision we have is to create a business that encourages young people to join us...so the S4G grant gave us the opportunity to engage with UWE and their students." **Rod Oldfield, GF Micro.***

Since its launch in November 2018, over 400 businesses have joined the S4G network and benefit from the programme. This number is only set to grow with a legacy of ongoing KE partnerships and activity.

HEIF funded roles were subsequently used to design, develop and bid write for the follow-on S4G programme which launched in January 2021 and has engaged 500 SMEs in Gloucestershire. This programme, which will award £1m of grants, is delivered with NatWest and Gloucestershire College.

S4G is a highly successful, research-based KE Initiative that brings together expertise from academia and industry, supporting ambitious SMEs and their founders to grow and scale. We are extremely proud of the programme, the impact on the regional economy and legacy of student and academic KE partnerships.



## University of the West of England: ExtraCare and UWE Bristol

In April 2018, UWE Bristol started a collaboration with ExtraCare Charitable Trust, funded by a Knowledge Transfer Partnership (KTP). Based in Coventry, with a retirement village in South Gloucestershire, ExtraCare runs housing developments and currently has almost 4,000 homes available for older people.

The KTP has developed expertise in smart living technologies, such as intelligent sensing and socially assistive robots, by exploring what technologies are capable of improving service provision, increasing productivity, generating revenue and upskilling staff.

The partnership with ExtraCare and project development was led by HEIF-funded Business Development Managers, based within the University's Research, Business and Innovation team (RBI), working closely with UWE Bristol's Professor Praminda Caleb-Solly. This 3-year project received dedicated support from design to final report from RBI's KTP Team who specialise in cradle to grave support, ensuring high quality, evidencable impact that supports the University's research and knowledge exchange ambitions.

The KTP and the University's work with other health and social care providers, has helped create a path for future opportunities for collaboration and knowledge exchange between academics and the care sector. This knowledge exchange will prove invaluable in dealing with the challenge of independent living amongst the UK's elderly population, and in ensuring dignity in old age becomes a reality.

The project has had numerous societal and economic benefits and addressed a government desire to see people placed at the heart of what universities do. It has helped elderly people improve their quality of life by allowing them to live independently for longer. Using the most innovative technological solutions has addressed often neglected issues surrounding dignity and old age. It has also used pioneering technology, in the form of assistive robots, to help with issues such as age-related mobility. In adopting a user-centred approach, UWE Bristol researchers have been able to adapt their work to address any ethical or cultural issues, thus expanding the benefits of their work. In working closely alongside a leading care provider, the research has been informed by best practice and first-hand experience in health and social care.

ExtraCare has taken the learning from the KTP by embedding a new accessible design standard that incorporates the smart technology agenda in their latest village in Solihull.

The Charitable Trust's Executive Director of Marketing and Innovation Henriette Lyttle, said, "Our vision is to enable better lives for older people and to create sustainable communities that provide homes older people want and lifestyles they can enjoy. This KTP is an opportunity to pioneer the integration of technologies into our retirement villages in order to increase quality of life and prolong independent living."

Building on the KTP, Professor Caleb-Solly is setting up a new EPSRC Healthcare technologies network to facilitate the creation of a healthcare robotics ecosystem connecting researchers, industry, and healthcare providers to build the infrastructure and systems to drive world-class advances in healthcare robotics research and development in the UK. UWE Bristol will work with ExtraCare and other partners to accelerate the development and deployment of assistive robots in health and social care.

# University of Westminster: Student Enterprise at Westminster

Core to Westminster's commitment to enterprise and innovation is the development of a new, expanded Student Enterprise Centre (SEC). This builds on the success of Westminster's Creative Enterprise Centre (CEC), launched in 2017, which in 2019 was named UK's leading University Enterprise Centre by Enterprise Educators UK.

In 2020-21 over 2,000 students attended CEC's programme of 90 expert-led masterclasses and workshops to develop skills in enterprise, freelancing and employability. This helped CEC scale up its creation of start-ups from 59 (2018) to 134 (2020). In 2020, the businesses in CEC's Accelerator raised investment income of £574,842, carried out £236,768 of R&D activity, and directly created 31 new jobs.

The CEC also supports student and graduate freelancers. Its creative agency service enabled students to produce digital content and applications for local SME clients, at cost price. In 18/19 services were provided to 13 companies, increasing to 71 companies in 19/20. In 20/21 CEC launched its own app <https://westminstertalenthub.app/> as a platform enabling students to provide services directly to businesses engaged by the CEC. Currently more than 100 students have freelance profiles on the app, across a range of specialisms from business development to web design, mostly completing small projects with an average value of £452.

The CEC is focused on engaging the breadth of the university's student and recent graduate community in enterprise. The CEC's focus on inclusive enterprise ensured that of 1174 students registered on its Enterprise Journey workflow, 53% were BAME, 45% were first generation HE students, 35% were first generation English speakers and 16% were registered with disability learning support. In 2020/21 CEC created the Pioneer Programme to connect student founders and freelancers from under-represented communities with a network of diverse entrepreneurs and mentors. 94 students developed a business application of whom 67% were female. Of those completing the 9-week Pioneer programme, 63% were first time scholars, 61% were BAME and 33% were first generation English speakers.

CEC has partnered with local providers to promote economic regeneration. As a member of Harrow Council's Strategic Partnership Group, CEC has supported Westminster graduates to locate their start-up businesses in Council run co-working spaces and to gain paid employment with local SMEs through the Harrow Business Improvement District. CEC was also part of a Harrow consortium which secured a £50k grant from the GLA to develop plans for a Creative Enterprise Zone.

CEC opens its events to SMEs, particularly the annual Westminster Inclusive Enterprise Festival (WINC), the Access All Rainbows event and the day-long London Venture Crawl (a tour of start-ups and enterprise support locations which was free to access to young entrepreneurs from the Oldham Enterprise Trust, in Greater Manchester). The same approach underlies the CEC's 2-year British Council funded Creative Spark programme supporting creative industry start-ups in Georgia, through a partnership with BTU in Tbilisi.

HEIF funding has helped support staff costs for a Centre Manager and funding inspirational entrepreneurs to provide masterclasses and workshops.

## **Aston University: Villa Vision – supporting the local community to improve eye health**

Villa vision is a Collaborative project between Aston Villa Foundation and Aston University supported by the Premier League / Professional Football Association designed to raise awareness on the importance of eye health, particularly amongst children.

Through fun, interactive lessons at schools, educational material and eye testing services, Villa Vision is helping spread the message of the importance of eye health.

Poor vision can often go unnoticed, particularly amongst children so Villa Vision provides the opportunity for children to have a free vision screening check at school. In addition to this, for those children requiring further investigation the initiative will also provide a full eye examination and glasses if required for free using a fully equipped mobile eyecare unit.

### **Role of HEIF**

HEIF supported the Director of Regional Strategy in setting up Villa Vision partnership arrangements and the part-UKRI funded 'Engaging Local Citizens in Aston's Research' public engagement project whose findings helped the team to understand the challenges the community faces to inform the direction of the Villa Vision project. HEIF also supported the purchase of the frames that are dispensed to children who need them.

### **Societal, economic and student benefits**

Student benefit: optometry students have the opportunity to volunteer to support the school sessions giving them real experience of working with children.

Societal benefits: are through children and their parents in the deprived wards around Aston University and Aston Villa receiving eye health information and care. Although vision screenings take place in schools in the reception year, many pupils do not register with an Optometrist and hence vision problems that develop later are not picked up and can impact on their academic performance. Villa Vision addresses these issues head on and supports local children to get access to glasses if they need them.

Economic benefit: uncorrected vision impairments impact on a child's educational attainment. In the longer term, pupils who can see properly are likely to achieve better academic results, giving them better opportunities in the future to do well and secure a better paid job than if they had uncorrected vision problems (The lancet global health commission).

### **Government priorities and RE-UKRI and OfS strategic objectives**

This project supports:

- The government priority area of build back fairer by supporting disadvantaged communities to overcome some of the barriers they have in accessing eye care for their children.
- RE-UKRI – Through Villa Vision an anonymised data set will be available to inform future research on vision and eye health issues in deprived communities
- OfS - Tackling disadvantage: being able to see properly puts children on a more equal footing and provides them with the tools to reach their potential (along with many other factors).

## **Aston University: Supporting aspiration, innovation and skills in the UK tech sector**

KTP is strategically important to Aston, and our portfolio of programmes is growing rapidly - we are now the 8th most active institution in the UK. Our academic excellence in Computer Science and Data Analytics plays a crucial role in our KTP portfolio, with 45% of our partnerships currently from this discipline.

These partnerships have played a pivotal role in helping us to co-develop the Computer Science Industry Club (CSIC) which harnesses cutting-edge industry expertise to generate high-level graduate opportunities enhance the skills of students and develop new research opportunities.

HEIF directly supported this activity as it funds our KTP development and was used to establish the programme in 2018. CSIC spans various UKRI/OfS priorities including those relating to business innovation, the levelling up agenda, skills and supporting social mobility.

### **Societal, economic and student benefits**

The UK tech sector has well-documented skills shortages in Computer Science. Our KTP partners told us that companies based outside of London, especially high-tech SMEs, faced particular challenges sourcing the talent and expertise that they need to drive innovation against global competition. Together, we wanted to develop a platform to help similar companies to recruit our best students while simultaneously harnessing their expertise to enrich our curriculum

Over 70% of our students are the first in their generation to enter higher education, and 29% come from the 10% most deprived neighbourhoods in the UK. Given this demographic, we wanted CSIC to help raise aspiration amongst our students by opening access to high quality career opportunities in high-tech businesses.

Student engagement to date has been very strong, with nearly 100 placement students and graduates securing jobs with partners. The compelling nature of the CSIC's activities has enabled us to charge companies a £3k a fee to join which pays for a project manager and ensures sustainability. The quality of the collaborations developed have delivered the following key achievements:

- Guest lecturing opportunities – CSIC members are invited to lecture on syllabus relevant topics. To date, CSIC has hosted over 30 guest lectures.
- Targeted student showcases – students presented work to club members with senior company staff offering valuable feedback and commercial insights. To date, 24 showcases have been held with 384 students presenting and 13 sponsored prize categories.
- Insight days – student visits to partner companies. A face-to-face event before Covid resulted in seven students being offered placement roles!
- Company contributions to Aston's annual Aston Hack, sponsoring the student-run event and being on the judging panel for prize giving.
- Curriculum input – partners sit on our Industrial Advisory Board to discuss skills gaps and contributed to the development of two new programmes (BSc Cybersecurity and MSc AI).
- £150K raised in fees and additional student sponsorship and £5M+ of research in Data Analytics and Machine Learning.

The Club's operations have already been recognised through a Princess Royal Training Award 2018 (in partnership with Majestic Ltd), through the Tata Consultancy Services Award for Best University Engagement 2018 and a 'Best of the Best' Award at the national KTP Awards.

# **The Open University: CORE – a global aggregator and provider of open access research literature**

## **What is CORE.ac.uk?**

CORE is an aggregator and provider of open access research literature that offers seamless, unrestricted access to over 200 million papers. CORE was created by Dr Petr Knuth in The Open University's Knowledge Media Institute in 2011 and over the last 10 years has grown to become the world's largest collection of open access full texts. CORE is used by researchers, libraries, software developers, funders and many more organisations across the world.

The not-for-profit CORE.ac.uk is ranked among the top 1,500 websites in the world by website popularity by the Alexa Global Rank and top 20 websites in Science and Education. It has over 50 million Monthly Active Users (MAU).

CORE.ac.uk has played a pivotal role in the global open science movement by:

- Widening access to and discoverability of scientific knowledge and driving change towards open science
- Empowering commercial and academic partners to develop novel solutions leveraging scientific literature
- Ensuring compliance with research funders' open access policies.

## **How was HEIF funding used?**

HEIF funding has significantly contributed to the development and commercialisation of CORE since its inception. In 2012/13 HEIF funding was used to explore the stakeholder landscape, improve the system and its user interfaces. The project demonstrated the wider potential of providing aggregated access to research papers and highlighted the demand of researchers, universities, and industry for powerful data-mining services. In 2016/17 HEIF funding was used to support the development of the systems infrastructure - this was vital for enabling the repository to grow and services to be delivered. As a testament to this investment, Research England is using CORE.ac.uk to verify HEIs' overall compliance with the REF 2021 open access policy.

In 2019 The Open University approved the formation of an internal business unit to manage the long-term sustainability of CORE through the commercialisation of services including:

- Recommender: support users in discovering articles of interest from across the network of open access repositories
- Discovery: assists users in finding freely accessible copies of research papers that are often behind a paywall
- Repository Edition: enables repositories to gain maximum exposure for their content and help ensure compliance with Open Access policies.

To achieve this, HEIF funding was used to appoint a business development manager to kick start the work of the unit and generate income through licencing CORE services to organisations across the world. In one year, the unit secured over a dozen licences and is well on the way to enabling CORE to achieve self-sustainability.

Looking forward, CORE is uniquely placed to support the Government's aims to increase UK investment in R&D to 2.4% of GDP by 2027 - through providing open access to millions of research papers CORE

will enable researchers and students to freely acquire the knowledge they need to unlock new discoveries and solve challenges facing society and the economy.

## **The Open University: Language learning with degenerative brain disease**

The Language Learning with Degenerative Brain Disease project supported the Healthy Aging Grand Challenge of the Industrial Strategy, using HEIF to apply an innovative approach to using non-medical interventions to combat dementia.

The global prevalence of dementia is set to treble over the next 30 years. In the UK alone ¼ of hospital beds are occupied by people living with dementia who are over 65. There is no single solution to combatting this hugely challenging syndrome and a multi-faceted approach is required to reduce the risks of developing dementia. The benefits of language learning to resist cognitive decline, build cognitive reserves and improve quality of life are well documented. However, the techniques used to successfully teach languages for wellbeing to older people, especially those with degenerative brain disease, differ from those used to teach languages to younger demographics. Consequently, the application of language learning to combat dementia is not being used to its full potential.

The OU partnered with Lingo Flamingo, a Glasgow-based social enterprise, to combine expertise and create learning resources enabling those employed in the care sector to develop skills required to deliver language learning to care home residents and those living with dementia in the community. The project, the first of its kind, set out to develop a pedagogy of language teaching for wellbeing, and aimed to train carers to deliver this pedagogical approach by translating it into set activity types that allow learner engagement at multiple levels, taking into consideration current thinking around the needs and capacities of people with degenerative brain disease.

The HEIF enabled development of a new income generating Continued Professional Development (CPD) course 'Learning Languages with Senior Learners'. The course covers 40 study hours and will be delivered online over 10 weeks on at least four occasions a year. While studying, participants will collaborate through sharing ideas and reflecting on the direct application their new skills in their professional settings. Lingo Flamingo assisted the OU in recruiting tutors who had experience in delivering languages sessions in care homes and upskilled them in delivering the online course to care workers. The CPD will be officially launched in 2021 and hosted on the OUs Open Centre for Languages and Cultures.

In addition to the immediate impact of the project on those suffering with dementia, the HEIF project will have additional benefits on the careers of care workers. The Covid-19 pandemic has highlighted the urgent need for care workers to be offered a wider range of development opportunities in order to make this career path more attractive, keep care workers employed for longer in a single workplace and provide greater sustainability of service. Feedback from the course pilot shows that staff highly valued the opportunity to learn new skills in developing a wider range of activities for engaging with the residents through non-medical interventions. The next step for the project team is to develop a digital badge with the Care Inspectorate to evidence professional development and add more value for the participating social care staff.



# **University of Bradford: Incanthera – synergies in spin-out growth and academic development**

## **Brief description**

Incanthera is a spin-out of the University of Bradford, concerned with the development of targeted therapeutics for tackling cancer. Since its foundation in 2010, Incanthera has acquired two patent families from the University and, in 2018, signed a unique pipeline deal with our Institute for Cancer Therapeutics (ICT).

This deal assigned first option to commercialise IP arising from selected laboratories over 10 years. At the University, we have allocated budgets equivalent to the full revenue of the deal to finance a centre for doctoral training in the ICT.

The deal helped pave the way for Incanthera to float on London's AQSE Growth Market in 2020. The University maintains a significant equity stake in the company.

## **How this was supported by HEIF**

At Bradford, our commercialisation process relies heavily on HEIF. It part-funds our patenting budget, without which the technology originating in Bradford would not have been available to Incanthera. And it part-funds the staffing of our Commercial Innovation team, which continues to handle the University's obligations as a shareholder in the company, having managed the original establishment of the firm and the several deals done between the parties to date.

## **Societal, economic and student benefits**

The company's flotation is indicative of both commercial and technical progress towards impact on the public and in the market. It licensed its first lead asset, ICT01-2588, in 2017; it is now focused on finding a commercial partner for a topical treatment for solar keratinosis and skin cancer prevention.

## **Supporting government priority areas and RE-UKRI and OfS strategic objectives**

Incanthera and its work have already had beneficial impact on the University through our pipeline deal. This contributes significantly to sustaining research excellence in ICT and has enabled three postgraduate research students to embark on their studies since 2018.

Looking forward, as the company's value continues to grow, we can consider realising some of the value of our shareholding for reinvesting in our research and innovation mission to shape and benefit future societies.

# University of Bradford: Visualising Heritage for the development of place

## Brief description

Bradford's Visualising Heritage team exploits state-of-the-art digital imaging and immersive experiences that leverage diverse cultural assets, distinctive places and communities, in order to support community and economic resilience. Our knowledge exchange partnerships have focused on activities that improve visitor and citizen experiences through enhancement of museums, heritage trails, and tourism (Bradford Museums and Galleries, British Museum, Visit Bradford); development of educational resources and archiving heritage (HS2 Ltd, National Trust); and improving citizen engagement in science and public policy and adapting local planning and policy (City of Bradford Metropolitan District Council (CBMDC)).

## How this was supported by HEIF

The team, based in our School of Archaeology and Forensic Sciences, has been supported through several HEIF-funded collaboration development projects in recent years, fostering new partnerships and new opportunities for knowledge exchange. HEIF has funded researcher time for scoping partner requirements to better understand technical or societal challenges, training and upskilling, design and piloting of new innovative approaches, and developing materials to disseminate knowledge.

## Societal, economic and student benefits

The activities funded by HEIF have directly led to a successful tender with CBMDC to establish an open-source smart digital clone of the city using high resolution 3D digital imaging. This will revolutionise and strengthen local planning and policy towards a resilient, healthy, and thriving district, including health and climate resilience (e.g., clean air and flood risk monitoring); clean growth strategies; future transport approaches; evacuation and disaster planning (e.g., fire); urban/civic planning and regeneration; and culture and tourism. The activities also aim to connect citizens with science and public policy and have been communicated to the public in open showcases (Unify Festival, Bradford Science Festival) and media (e.g., Visualisation of HS2 Curzon Street Roundhouse). The team is also building on the digital clone to embed immersive experiences, working to enhance the attraction of the Bradford City Heritage Walk (Visit Bradford) and embrace urban city parks to embed climate resilience and improve citizen quality of life (CBMDC) which includes intangible heritage (e.g., historical accounts and stories that connect citizens with place)

Our partnership work involves students within the School from undergraduate and taught masters to PhD undertaking training in digital skills within real projects using state of the art equipment, including both aerial and ground-based techniques. The growth in this area has led to a new MSc for 2021/22 in Landscape Archaeology and Digital Heritage that will train students in 3D methods of digitally documenting objects, sites, and landscapes.

## Supporting government priority areas and RE-UKRI and OfS strategic objectives

This programme is a prime example of a university working with civic partners to advance the place agenda. We are to make openly available the medium-resolution 3D visualisation data we gather, as free resources to stimulate innovation in the places we capture.

Moreover, we will maintain high-resolution datasets for further research study and commercial development. This initiative thus furnishes us with key assets for sustaining our research excellence, another objective of RE. Indeed, this initiative was central to the institution's recent investment, leveraging World Class Laboratories and internal capital funds, in major upgrades to our research storage capacity.

# University of Plymouth: iMayflower

## About

[iMayflower](#) is an ambitious project to build Plymouth's Creative Industries, with a focus on immersive and digital technologies. The project includes a £3.5 million grant from the Cultural Development Fund (CDF) - a programme from the Department for Digital, Culture, Media and Sport (DCMS) and Arts Council England designed to enable transformative culture-led economic growth and productivity.

iMayflower is a partnership between the University of Plymouth, Plymouth City Council, Real Ideas Organisation, Plymouth College of Art, Mayflower400, Destination Plymouth, Creative England and Crowdfunder UK. The consortium supports businesses and communities across diverse sectors including the Creative and Cultural Industries, Marine, Advanced Manufacturing, Health and Wellbeing and Tourism.

## How was it supported by HEIF?

In addition to the CDF grant, the project includes £2.5 million in match funding from partners. The University has invested over £190k HEIF in direct and indirect match funding to deliver iMayflower, create linkages with other funded KE projects such as the [South West Creative Technology Network](#), [Cultivator](#) and [Engaging Students in KE](#), and enable a wide range of activities, including:

- Capacity and capability to connect our world-class facilities for [Digital Fabrication](#) and [Immersive Media](#) with businesses, students and staff to develop innovative products, services and experiences.
- [IGNITE Festival of Creativity](#) and [Digital Platform](#) to showcase the creative talent of our students, connect them with employers and retain talent in Plymouth.
- [iLead Creative and Cultural Leadership Development Programme](#) to drive cross-sector collaboration and respond to city-wide challenges around Creative Placemaking, Immersive Futures and Sustainability.
- [Innovative Placements Scheme](#) to pair students and graduates with businesses to help accelerate research and development.
- [Plymouth Startup Weekend](#) to encourage and enable budding entrepreneurs and intrapreneurs to thrive.
- Upskilling, networking and awareness raising events and initiatives for staff and students; focusing on the inclusive use of digital platforms and improving interactions with businesses.

## Impacts

iMayflower has delivered significant societal, economic and student benefits, including:

- Increased quantity and quality of engagement with businesses, social enterprises and organisations in the voluntary and community sector, leading to increased growth, productivity and capacity for innovation.
- Growth in the number of staff and students participating in KE and the development of mutually beneficial, interdisciplinary projects, partnerships and collaborations.
- Alignment of HEIF funded activities with key enterprise and employability initiatives; bringing students from different disciplines together to work on real-world challenges and improve connectivity and dialogue with external organisations.

## **Strategic alignment**

iMayflower delivers against a number of government priority areas, as well as the strategic objectives of RE-UKRI and OfS, including:

- Encouraging engagement and collaboration between researchers, government, industry and the public; catalysing world-class KE by connecting and working in partnership with diverse communities; developing an inclusive and high quality research and innovation ecosystem.
- Supporting the delivery of the UK Research and Development Roadmap; for example, through securing economic and societal benefits from research, supporting entrepreneurs and start-ups, enabling place-based growth and R&D.
- Ensuring that every student, whatever their background, has a fulfilling experience of higher education that enriches their lives and careers.

# University of Plymouth: Enterprise Solutions

## About

[Enterprise Solutions](#) is the gateway for external organisations to access the University of Plymouth's internationally renowned research expertise, world-class facilities and student talent. A dedicated HEIF funded support service driving industry collaboration at the University of Plymouth the team works with dozens of academics and thousands of businesses across health, science, advanced manufacturing, engineering and humanities every year.

Established for over 15 years, Enterprise Solutions works with the business community to ensure economic benefits and alignment with UKRI priorities relating to maximising the impact of research and incentivising new collaborations to tackle societal and economic issues.

## How was it supported by HEIF?

HEIF funds the three full time staff and a range of initiatives and activities designed to maximising the impact of research and incentivising new collaborations to tackle societal and economic issues.

The Enterprise Solutions Team engaged with 1,300 organisations in 2020/21, both large and small, to find innovative solutions to the challenges they face. This could involve joint research and development projects, access to our facilities and student talent or academic expertise. Collaborations also exist with Chamber of Commerce, Manufacturing Groups and private sector intermediaries such as angel networks, banks and accountants.

Enterprise Solutions provides engagement routes into the university via a dedicated telephone number, website, email and one-to-one support to enable businesses and public or third sector organisations to tap into university services, injecting new thinking to support and drive innovation. A wide range of activities undertake by the Enterprise solutions team include:

- Delivery of £200,000 [R&D Solutions Fund](#) that supported 10 university-industry collaborations and identified 60 further partnership opportunities
- Joint delivery of [South West innovation Expo](#) for 800 investors, businesses and academics

## Impacts

Enterprise Solutions has delivered significant knowledge exchange impact in the form of new university-industry collaborations that include:

- Working with Finsen Technologies, London, on the efficacy of Ultra Violet-C technologies on decontaminating clinical gowns and surfaces from pathogens.
- Working with graduate start-up company Robotriks to develop a new prototype of an autonomous agricultural robot that can navigate uneven terrain.
- Partnering with AlphaFox Systems Ltd, Honiton, to develop unique non-forgable identity badges, using 3D printing, for the defence sector.
- Collaborating with Zimmer and Peacock, Ltd, on the development of a device that would be able to diagnose cardiovascular disease.

- Working with Clyz Labs Limited, Runcorn, to develop a proof-of-concept for a new form of personalised treatment for lung cancer.

## Strategic alignment

Enterprise Solutions delivers against a number of government priority areas, as well as the strategic objectives of RE-UKRI and OfS, including:

- Delivering the long term vision for R&D as described in the R&D Roadmap and aligning with the Innovation Pillar of Build Back Better to support our SMEs to grow.
- Encouraging engagement and collaboration between researchers, government, industry and the public;
- The regional focus aligns with the mission to level up the country by *“leveraging the capability of the UK’s geographically dispersed R&D assets, maximising the benefits of innovation for local economies and building on local strengths”*