As an outward-looking university, Sheffield Hallam is committed to engaging in research that not only adds to the knowledge economy, but also offers solutions to societal and policy issues and transforms organisations and communities. In this feature we explore the University’s unique contribution to higher education, business growth, policy and the public.

Recognising the need to refocus its goals and priorities in light of a competitive and changing research and education environment, Sheffield Hallam University has carved out an ambitious plan to ensure it continues to produce world-class research, and a teaching and learning experience that ranks among the UK’s top universities. Seeking to engage in research that will have far-reaching impact, the University addresses social, economic and cultural issues that carry importance at the local, national and international levels. These efforts are facilitated through cross-disciplinary collaboration and partnerships with research institutes, industry, business, government, NGOs, societies and the public.

SUBMISSION TO THE RESEARCH EXCELLENCE FRAMEWORK 2014

The University’s research takes place within 18 research centres, covering subjects such as materials and engineering, sport science, health, art and design, and economic and social research. To support its work, the University has submitted 11 Units of Assessment to the Research Excellence Framework 2014 – a new system that replaces the Research Assessment Exercise in evaluating the quality of research in UK higher education institutions.

SHEFFIELD HALLAM UNIVERSITY’S STRATEGY TO 2020

Based on the values of:

- Academic ambition
- Being practical and applied
- Supportiveness and inclusion
- Collaborative, flexible and innovative thinking
- Honesty, integrity and high professional standards

The vision for 2020 is to be recognised as a leading UK university known for:

- Excellence in teaching and student experience with highly satisfied students
- The value added to the futures of students, partners and staff
- Internationally recognised research with real-world impact
RESEARCH WITH REAL-WORLD APPLICATION

Exploring research that addresses real-world challenges and makes a difference to quality of life is a key goal at the University. Research projects therefore often focus on issues that have been pinpointed by the UK Government, EU, Research Councils, the NHS and the private sector. To guarantee maximum impact, studies are designed to facilitate knowledge exchange and translate outputs. Recent examples of the University translating research into real-world practice can be found in projects related to materials and engineering, health and social care, and economic and social research.

CASE STUDY: MATERIALS AND ENGINEERING RESEARCH INSTITUTE

The Materials and Engineering Research Institute (MERI) has been leading in the field of high power impulse magnetron sputtering (HIPIMS) for over a decade. HIPIMS is an innovative plasma technology that is used to pre-treat surfaces and deposit coatings in order to enhance the performance of materials. It has been developed by Professor Arutjun Ehiasarian, Head of the HIPIMS Technology Centre at Sheffield Hallam, and attracted attention because of its potential application in industry. The University’s research in this field has continued to garner interest, with work led by Professor Papken Hovsepian, Head of the University’s Thin Films Research Centre, being no exception. Hovsepian is a top expert in the field of nanoscale, multilayer Physical Vapour Deposition coatings for industrial use. The coatings he has developed are both tough and elastic, making them useful for a number of fields. As a result, this technology has been licensed for application globally, in sectors ranging from biomedicine to the automotive industry. HIPIMS surface pre-treatment has achieved sales and licence income with a combined value running into the millions of pounds. In 2010 the Joint Sheffield Hallam University-Fraunhofer IST HIPIMS Research Centre was established, the first such Centre in the UK.

MERI has also enjoyed success through its work with Sheffield vehicle suspension manufacturer, Tinsley Bridge. A recent venture involved developing ultrahigh strength steel for vehicles used in defence environments. Commissioned by BAE Systems, Tinsley Bridge were challenged to develop a suspension system for the British Army’s Warrior Infantry Fighting Vehicle that could handle increased weight loads while retaining mobility. With the help of MERI’s research and innovation team, Tinsley Bridge improved the suspension of the warrior vehicle, making it stronger and capable of lifting vehicles high off the ground – ultimately offering soldiers protection against mines.

Another project that emerged from MERI’s research was the development of ceramic body armour for the protection of combat troops. The UK Ministry of Defence funded the original concept, conceived jointly by Dr Hywel Jones, a ceramics expert at the University and Dr Anthony Pick, an independent expert in industrial ceramics. The material’s advantages include being lighter than other ceramics, the ease of production of complex shapes and its lower costs of manufacture. In ballistic trials the material has been shown to protect against armour-piercing bullets. The material is also highly wear resistant and can be used at high temperatures, making it ideal for use in industrial processing. Its success led to the research being awarded the 2011/12 Venture Prize for the most commercially promising UK innovation in materials science. The spin-out company XeraCarb Limited was established in 2012 to manufacture the material and has attracted significant venture capital and private investment along with a number of development contracts from the Ministry of Defence and the Technology Strategy Board.

Continuing the theme of protection, MERI robotics expert Professor Jacques Penders partnered with South Yorkshire Fire and Rescue Service and other European collaborators to create robots able to enter smoke filled buildings. The idea was that these palm-sized robots, referred to as Viewfinders and Guardians, would go ahead of firefighters to assess damage and dangers, as well as obtain vital information, such as safe routes, location of the fire and toxic chemicals. The goal is that such robots will enable firefighters to successfully tackle fires and save lives.
CASE STUDY: CENTRE FOR HEALTH AND SOCIAL CARE RESEARCH

Partnering with the South Yorkshire Collaboration for Leadership in Applied Health Research and Care, the Centre for Health and Social Care Research has engaged in several projects looking to improve care in Doncaster and Sheffield. The research, primarily funded by the National Institute for Health Research, centred on the self-management of long-term conditions, particularly overseeing unplanned care. The projects ran during 2009-13 and involved collaboration between the University and Doncaster and Sheffield Clinical Commissioning Groups (CCG). The work led to a number of practice-based outcomes, including the development of a virtual ward to overhaul care for those at risk of emergency admission, as well as a review of the unplanned care pathway in Doncaster CCG.

CASE STUDY: CENTRE FOR REGIONAL ECONOMIC AND SOCIAL RESEARCH

Tackling issues related to social and economic disadvantage is the central focus of research at the Centre for Regional Economic and Social Research. A study on seaside towns conducted by Professors Christina Beatty and Steve Fothergill has broken new ground by finding novel ways to collect and understand the evidence on the people and work available in these coastal areas. This research has dispelled myths about their decline, providing instead a more subtle view of trends around the coast – namely that there is economic growth as well as unemployment, and real differences from one town to another. Where the impact of this research has really been felt is in local and national government. Here, its evidence and recommendations have helped policy makers and politicians make a number of important policy and funding decisions about the UK’s seaside towns, including the creation of the Coastal Communities Fund.

CASE STUDY: ART AND DESIGN RESEARCH CENTRE

Research in the Art and Design Research Centre is led by Paul Chamberlain, Professor of Design, and focuses on the development of new methods and techniques for research and their application in the generation of products, designs and works of art that change understanding or create new knowledge that adds to social, cultural and economic wellbeing. One project making an impact involved exploring the value of artefacts in developing knowledge and the role of haptic (touch) cues in improving the design and usability of products. The research has informed the design of TacMap, a tactile map that enables blind and partially sighted users to move more easily around interior and exterior spaces. In 2010, a spin-out company TacMap Ltd was formed, which continues to further the aims of research, providing greater independence and dignity for blind and partially sighted people through the use of TacMap. It also works with businesses who wish to provide more inclusive and compliant services in relation to the Equality Act 2010 agenda.

CASE STUDY: CENTRE FOR SPORTS ENGINEERING RESEARCH

Sheffield Hallam boasts the largest sports engineering research centre in the world and is globally recognised for its breakthroughs in applied research. A significant win in this area can be seen in the work of Drs Tom Allen, Simon Choppin, Simon Goodwill and Professor Steve Haake who have developed new methods to allow accurate 3D measurement. These methods have been applied to measure the performance of sports equipment and competitors, both in training scenarios and at actual sporting events. Technology developed for the laboratory was then translated to new in situ systems that were simpler, more accurate and less costly than previous methods. This success led to Centre for Sports Engineering Research implementing camera-based analysis systems within numerous Olympic GB training facilities in preparation for London 2012 and Rio 2016, and the implementation of systems at the International Tennis Federation to allow them to monitor the game of tennis and set its rules. It has also led to other health and commercial sector innovations.
94% of graduates are in work or further study within six months of graduating. 75% of graduates employed in a professional or management position within six months of graduating, completed a sandwich year in industry. Venture Matrix scheme received the National Enterprise Educator award in 2010. 1,600 students took part in Venture Matrix projects with more than 100 external organisations in 2013. In 2013 the University supported almost 600 students with their business projects. Delivered specialist advice and services to more than 340 businesses in 2012-13.

FACILITATING INNOVATION

Working closely with industry and business has been an integral part of university life for several decades. During this time the University has provided business and industry access to academic expertise and resources and in return gained market insight and know-how, as well as opportunities to collaborate on research projects and send students on work placements. Such partnerships have driven innovation, contributed to economic growth and enhanced the academic environment.

SUPPORTING BUSINESSES

The University’s vision to drive innovation and advance the regional economy has grown over the years and today it offers businesses a variety of services, from consultancy and research expertise to training and development, as well as access to funding advice and advanced technologies and facilities. These facilities have generated much interest, with 340 businesses benefiting from expert advice and services in 2011-12 alone.

INNOVATION FUTURES

A popular initiative at the University is Innovation Futures, a project that offers businesses access to consultancy, support and expertise in the areas of materials and engineering, creative and digital technologies, business and management service, food and bioscience services. Led by the University and supported by the European Regional Development Fund 2007-13, this programme allows businesses to work with a multidisciplinary team of experts who can advise on areas such as how to evaluate possibilities and create an innovation plan. By participating in the programme, businesses are better equipped to explore new products, develop a new approach to innovation and improve organisational efficiency. The larger impact of Innovation Futures is the role it plays in stimulating business growth, creating jobs and contributing nearly £15 million of GVA growth to the regional economy.

EMPLOYABILITY – VENTURE MATRIX

The University’s strong links with industry means that it is able to help students gain professional skills and experience as they study. Students are encouraged to take advantage of opportunities to acquire business insight and experience, and courses are designed to create work-ready graduates that can support and facilitate company growth.

To boost employability the University runs Venture Matrix, a work-experience and learning scheme embedded into a degree programme. Through the scheme students work in teams on real-life projects for SMEs or organisations, helping them to develop professional skills and a spirit of enterprise and entrepreneurship. The scheme is currently available in 70 modules throughout the University and about 3,500 students can potentially participate in the programme.

ENTREPRENEURSHIP – ENTERPRISE CHALLENGE

Students looking to create their own businesses have access to a raft of support facilities at the University. One avenue is through the Enterprise Challenge, an annual business start-up competition that invites would-be entrepreneurs to submit their business ideas. The student or graduate with the winning entry receives a £5,000 cash prize and expert advice and support to start their own business. This year, for the first time, a £2,000 cash prize will also be awarded to the best social enterprise business idea that reaches the finals. There is also a £5,000 prize for Best Manufacturable Product.