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Welsh Government

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Introduction from the President

I am delighted that the Learned Society of Wales (LSW) commissioned King's College London to produce *'The impacts of research from Welsh universities'* analysis. The study analyses a snapshot of the remarkable research being conducted at our universities in Wales, as seen in the 280 impact case studies submitted to the Research Excellence Framework in 2021 (REF 2021).

This showcase report, designed in direct response to the full analysis, provides a dynamic and high-level overview of the core findings. It highlights the extraordinary achievements driven by research, offering real-life examples that demonstrate how Welsh university research continues to significantly impact lives in Wales and across the globe.

As Wales' National Academy, our mission is to promote and develop Wales' research and innovation community, and to support the use of excellent and diverse research to solve the challenges faced in Wales and around the world. The Learned Society of Wales passionately believes in the power of knowledge to transform society. We stand firm in our conviction that decisions grounded in evidence pave the way for genuine societal advancement. This showcase report champions our role as an independent, authoritative voice, advocating for the impact of research across all disciplines in achieving this aim.

I would like to extend our thanks to the Higher Education Funding Council for Wales, the Welsh Government, and the Wales Innovation Network for their invaluable support in this project. Together, we've taken a bold step towards understanding and celebrating the remarkable impact that Welsh university research has on our world.

Professor Hywel Thomas
President



You can access the full analysis
and find out more about the
REF via the QR code.

Making an Impact: A Celebration of Welsh Research

Welsh universities are at the heart of innovation and progress. The full analysis has unearthed just some of the ways in which Welsh research undertaken at our universities enriches not just Welsh society but the whole world. The average time from initial funding to the realisation of outcomes is 11 years and involves the collaboration of different disciplines and a variety of organisations – so much so that every impact has been achieved through a unique set of circumstances. This reinforces a vital point that research, far from being a quick fix, is a patient exploration of knowledge and discovery that through working with a wide variety of people will produce profound results for our economy and society over time.

Impact is all about real effects and real people who benefit from the research being undertaken. Ranging from health promotion to technological advancement and environmental preservation, Welsh university research is changing lives, pushing boundaries, and showcasing incredible potential.

Key Findings:

Celebrating Research Impact

1

Benefitting Every Part of Society and a Broad Spectrum of People:

Welsh universities are actively reshaping every part of society for the better. The impact of research reaches far beyond our university campuses, touching the lives of real people. An impressive quarter of the research impact from Welsh universities benefitted children and young people, but it doesn't stop there.

There are a total of 25 different types of groups or people that benefitted from the impact of Welsh research including policy-makers and local communities, the elderly, women and people with disabilities. The broad spectrum of individuals and groups experiencing the benefits of Welsh university research underscores research's vital role in shaping a more promising future for individuals and communities.

Many types of people and groups benefitted from Welsh research



Children (under 18)



Communities



Women and gender-based groups



Marginalised and minority communities



Families



Carers



Citizens



Disabled people



Elderly



Creative industries professionals



Parents



Refugees



Cancer patients



Other

Arts and health fusion: enhancing dementia care and well-being

The research led by **Cardiff Metropolitan University** on improving the quality of life for people with advanced dementia has demonstrated profound societal impact. By creating and evaluating objects designed with playfulness, creativity, and touch in mind, such as the innovative HUG™, the team has contributed to increased functional and cognitive ability in 87% of dementia patients involved in trials. Similarly, **Wrexham University** has bridged the arts and health sectors with research into the impact of art on health. Both examples demonstrate the collaboration between the arts and health practices that have spurred significant advancements in social care and benefiting a broad spectrum of people.

Shaping migration narratives

Research at **The Open University in Wales** has played a crucial role in benefiting a broad spectrum of people including refugees and migrants. Understanding that misinformation poses serious threats to the safety and perceptions of migrants, the research team developed an inclusive approach to promote better understanding and safety. They bridged gaps between policymakers, support organisations, and migrants, and collaborated with international broadcasters to create a multilingual platform for accurate migration information. By offering online workshops for asylum seekers and refugees in Wales, they have improved access to education and learning.

Through these efforts, this research demonstrates a substantial positive impact, driving changes in policy and public perception.

Research into “**Making Ethnic Minority Women Visible**” ignited public debate on the lack of memorials dedicated to Welsh women. This in turn led to the creation of statues to the inspirational headteacher Betty Campbell in Cardiff in 2021. Writer Elaine Morgan’s statue followed suit in Mountain Ash in March 2022 and more recently, the pioneering poet, campaigner, and mariner, Cranogwen, was honoured with a statue in Llangrannog in June 2023. This is just one example of how research can have tangible impacts that reach beyond academia, leaving a lasting legacy of positive change for generations to come.



Betty Campbell statue in Cardiff

2 Economic and Policy Impacts:

The impact of Welsh university research extends to economic transformation which in turn has led to the generation of employment opportunities. Financial impacts were recognised in a third of case studies, producing tangible results in the form of the creation of, for example, more than 2,500 new jobs across the public and private sectors. This demonstrates how research impact is fuelling positive changes and driving economic growth.

An AI approach to cybersecurity:

The collaboration between **Cardiff University** and Airbus has led to a groundbreaking approach in cybersecurity, shifting focus from traditional code signature identification to tracking the behaviour of malicious software. This method has significant implications for protecting society's critical infrastructure from threats like the WannaCry attack, which impacted over 200,000 computers across 150 countries. By employing the latest in artificial intelligence and machine learning, this partnership has not only created a live, automated defence against cyber attacks but also serves as a catalyst for enhanced security, reinforcing societal resilience against potentially devastating digital threats.

Funding from the Welsh Government backed more than a quarter of all case studies submitted to the REF in 2021. Additionally, of the studies that identified a distinct Welsh funding source (regardless of its governmental affiliation), 88% benefited from this support.

3 Local Impact with a Global Reach:

Rooted in Wales, the benefits of research being undertaken at Welsh universities are felt in Wales and worldwide. 'Impact in Wales' is the predominant outcome of Welsh research with 70% of impact, coming from across all disciplines, having an impact in Wales. Over a third of research reported an impact that was relevant to key Welsh Government priorities: climate change and net zero, Cymraeg 2050, children and young people, Welsh national well-being indicators, and productivity.

Wildfires and the impact on global water sources

Researchers from **Swansea University** have tackled the global threat of water contamination from wildfires, a risk affecting 60% of the world's largest cities and 70% of the UK's population. Collaborating with scientists, fire services, and water suppliers, researchers developed methods to quantify and mitigate this risk by focusing on analysing wildfire ash, its behaviour in water and its impact on water quality. The results have informed land management and drinking-water provision in Australia, England, and Spain, improving post-fire diagnostics. This collaborative research is both crucial and especially relevant given the alarming number of wildfires in 2023.

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Over **60%** of research impact extends internationally to countries such as Australia, China, Norway, and Japan, underscoring the global significance and demonstrating the expansive reach of our Welsh universities.

4

Transforming Processes and Enhancing Practices:

A striking **85%** of the case studies analysed **resulted in tangible enhancements in processes and practices** in crucial fields. Areas such as education and public administration, as well as health and social work, where over a third of cases have improved processes and practices because of research at Welsh universities. Transformations such as improving nursing support for secondary breast cancer and the process for training nurses as diabetic footcare officers in human health and social work reflect the practical application of research, exerting positive influence and impact on aspects of social and economic life.

Building resilient families

Researchers at the **University of South Wales** in collaboration with Hywel Dda University Health Board, Cwm Taf Morgannwg University Health Board and the All India Institute of Medical Sciences (AIIMS), Rishikesh, developed the Family Resilience Assessment Instrument and Tool (FRAIT), a groundbreaking tool that allows health visitors to assess family resilience and pinpoint needed support. This innovation is now mandatory in the Welsh Government's Healthy Child Wales Programme for children under five. By enabling targeted interventions, FRAIT ensures families receive the right help to cultivate resilience, giving children the best start in life. This tool illustrates the transformative impact of research collaboration, making a tangible difference in human health and social work activities.

5

Partnerships with Real-World Stakeholders:

Collaboration plays a pivotal role in research and its impact. An impressive **94%** of case studies from Welsh **universities reported creating impact through collaboration with a partner outside of the university** itself, involving external partners like government bodies, industries, international organisations, and charities. Welsh research in 'Energy, Environment and Engineering' and 'Information, Applied Technology and Analytics' in particular had more collaboration with corporate organisations than across the UK. These partnerships enrich research outcomes by leveraging real-world insights and expertise.

Protecting the world's marine biodiversity

The urgent need to preserve marine biodiversity and ensure a sustainable food supply makes the research by **Aberystwyth University** in association with **Bangor** and **Swansea Universities**, on the genetic definitions of fish species and stocks a global priority. Many fish stocks, including commercially significant ones such as yellowfin tuna, are threatened, necessitating accurate data to prevent overfishing and protect local economies. Using advanced DNA techniques, the team's groundbreaking work has reshaped fisheries management, leading to better

conservation practices and economic benefits for fishing communities. This research, undertaken in partnership with the University College Cork, Bord Iascaigh Mhara (Ireland's seafood development agency) and Foras na Mara Marine Institute (Ireland's marine research and development agency) has become a cornerstone for aligning ecological stewardship with human needs, not only protecting vital species but also setting a necessary precedent for conserving marine ecosystems worldwide.

6 Multiple Pathways to Success:

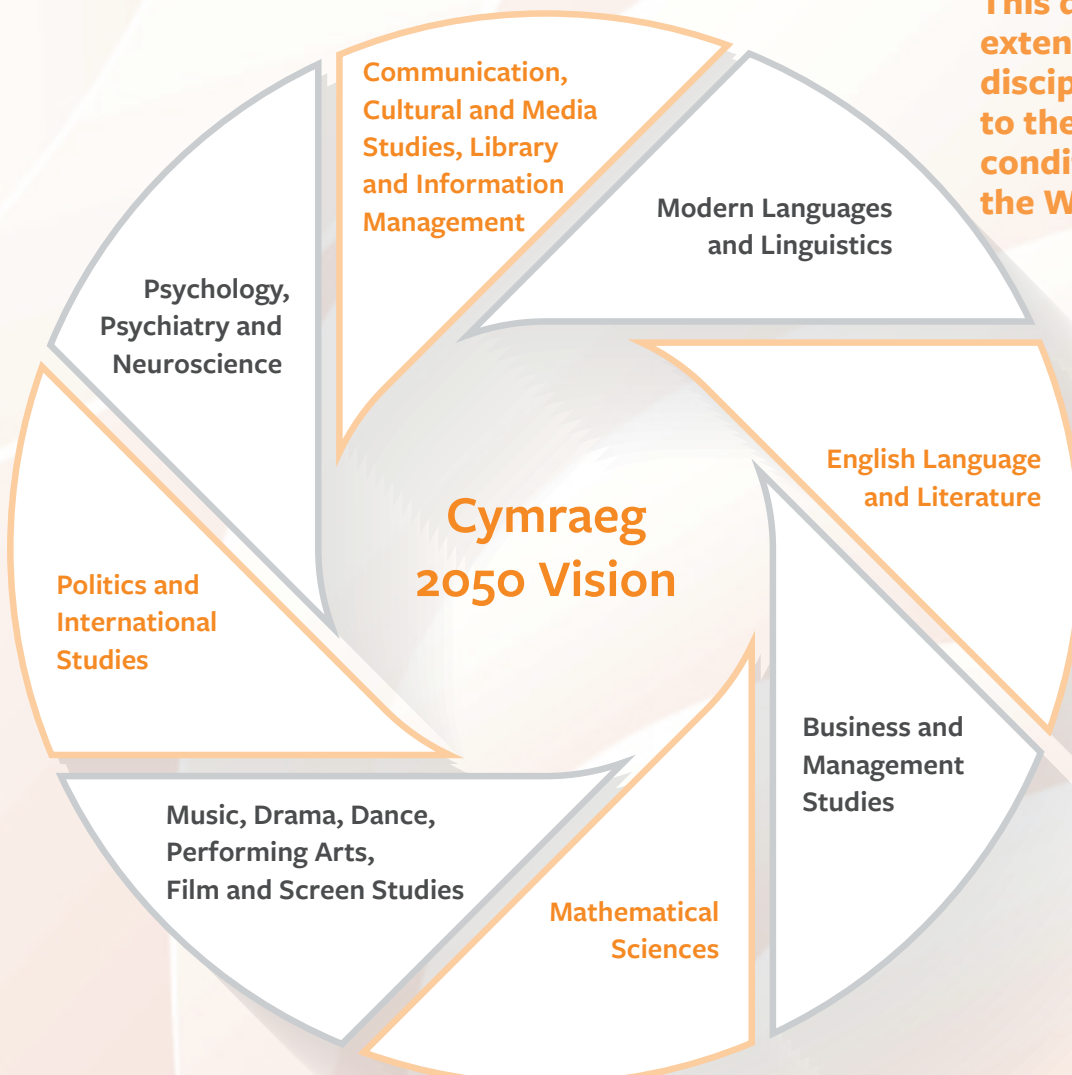
Research impact isn't about following a single route from initial research to an outcome. Every impactful outcome is different and a result of diverse areas of research working together, intersecting in different ways and collaborating with different people and organisations. By creating an environment that supports varied approaches and embracing a comprehensive

perspective, the multiple pathways approach demonstrates that success isn't confined to a single route. Rather, it showcases that outcomes can emerge from many angles, thriving on the synergy of interconnected parts. This includes for example, instances such as art and design research leading to neurological advancements with health and economic impact.

Empowering children with neurodevelopmental conditions

The Cerebra Innovation Centre at the **University of Wales Trinity Saint David** has enhanced independence and quality of life for children with neurodevelopmental conditions. Through personalised inventions like the Goto Seat and the Scoot Seat, the centre has created opportunities for social inclusion and practical engagement. More than just tools, these products are catalysts for physical, cognitive, and sensory development, empowering children to explore and engage with the world around them in ways that were once unattainable. Now sold in over 50 countries, these innovations are breaking down barriers and transforming lives for children with complex needs.

This demonstrates the extensive array of disciplines contributing to the foundational conditions that nurture the Welsh language



A Vision for the Future of Welsh University Research

This study, highlighting a decade of creativity by researchers at Welsh universities, conveys the message that genuine progress demands time, unwavering commitment, and a deep-seated dedication. Every amazing outcome is the result of an infinite combination of collaborations between different disciplines and organisations. The vivid picture it paints isn't just of academic interest; it's a story of real change, collaboration, and innovation that speaks to the core of Welsh society.

These findings underscore that research isn't a distant abstract, but a tangible force positively impacting on our lives in so many ways. The research conducted within our universities in Wales serves as a powerful demonstration of the transformative nature of persistent exploration, inquiry, and collaboration. Through these efforts, research enhances our quality of life, shaping our world for the better and leaving lasting impacts.

Let's celebrate these achievements and continue to support and uplift the brilliant minds behind them. Together, we can look forward to a future where Welsh university research continues to inspire, innovate, and impact the world in ways we can all feel and appreciate.



Explore more case studies
from our universities via the
Universities Wales website



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