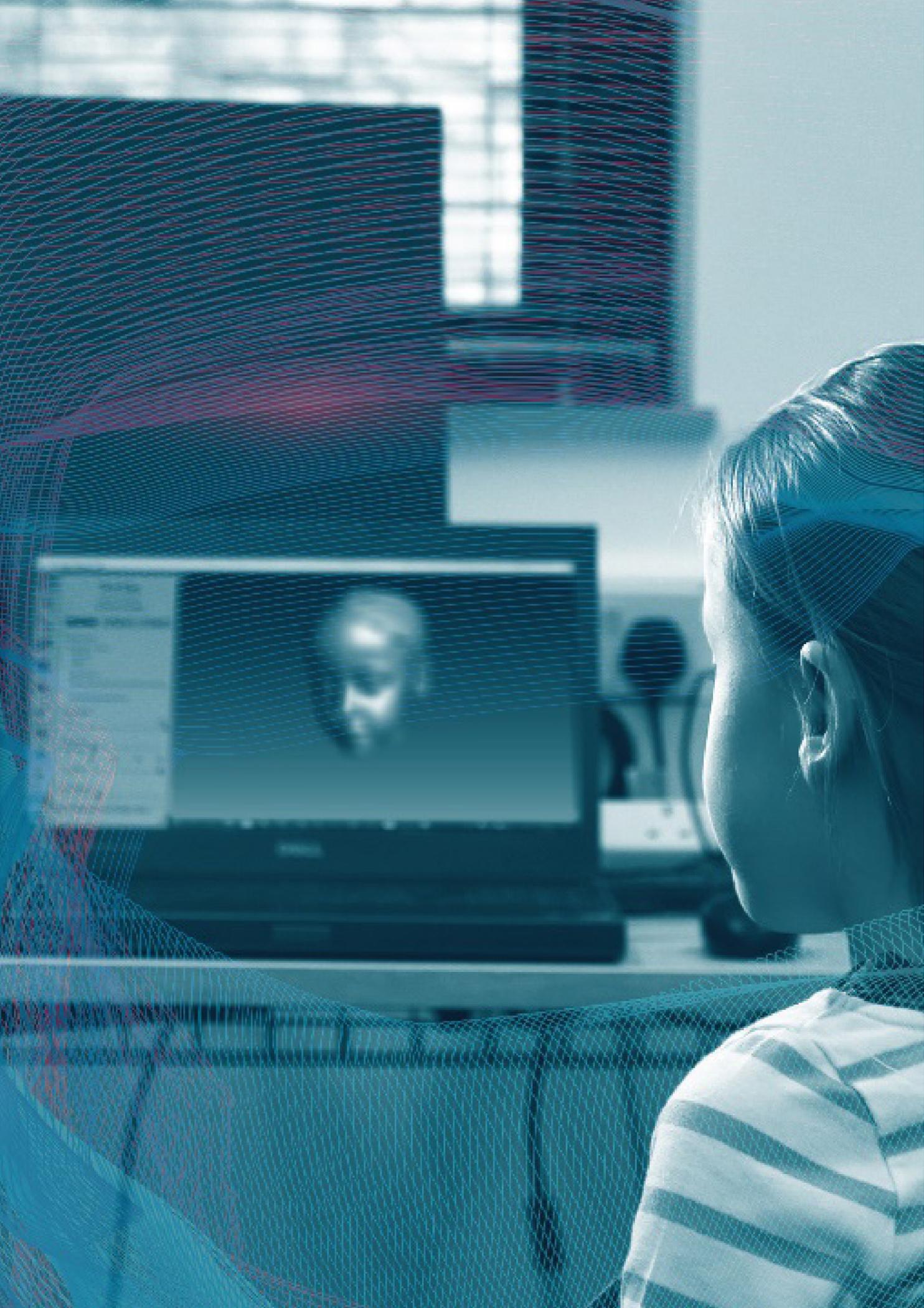




Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Research and Innovation Strategy

Executive Summary



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UWTSD's Vision for Research and Innovation

UWTSD's vision is that our researchers drive innovation: the process that turns great ideas into value, prosperity, productivity and wellbeing. It is this vision that will promote wellbeing and adapt to new opportunities and challenges.

The University of Wales Trinity Saint David celebrated its bicentenary in 2022. Since 1822 the University has been proud to provide accessible higher education to the people of the communities it serves. In this, the University delivers high quality learning opportunities for our students informed by research and partnerships with industry and civic society.

While the University's research centres will continue to undertake discovery research of the highest academic standing, they will also deliver and build expertise in planned programmes of research and knowledge exchange which systematically drive innovation. This innovation will meet the challenges and opportunities that our communities, businesses and societies face: transforming lives, locally and globally.

To drive innovation, the University's research will prioritise programmes of collaborative research in partnership with key stakeholders in industry and business, in educational and NHS

settings, in our cultural institutions and communities, and with governments and agencies in Wales, in the UK and globally. We will undertake contract research, IP exploitation and commercialisation to drive economic growth. These will work hand in hand with regional regeneration, enterprise and business support, as well as programmes of continuing professional development, civic mission and public engagement. It is this vision that will promote wellbeing and adapt to new opportunities and challenges.

Strategic Objectives

To achieve our vision for research and innovation, UWTSD will:

- Develop a sustainable research-base, recognised for its excellent quality (achievement of excellence).
- Build strong partnerships with industry, our public services and communities (development of place).
- Achieve excellent economic and social impacts through research, enterprise, entrepreneurship and skills development (leading innovation).
- Form partnerships to exploit innovation and embed resilience (strengthen collaboration).

UWTSD's Research and Innovation Priorities

We will:

- i. Increase knowledge and understanding through our research.
- ii. Implement detailed plans to maximise the economic, environmental and societal impact of our research.
- iii. Support growth and excellence in commercialisation & income generation
- iv. Deliver sustained economic growth through research informed high-level skills development, CPD & lifelong learning.
- v. Make a significant contribution to Regional Regeneration in Wales
- vi. Incentivise, support and reward staff who undertake excellent research, knowledge exchange and innovation activity.
- vii. Develop a world class doctoral training environment through the Doctoral College.
- viii. Develop a Research Action Plan for the Welsh Language.

Increase knowledge and understanding through our research.

Our priority is to ensure that all researcher active staff are continually producing excellent research outputs of an international standard, and to support interdisciplinary research and collaborative approaches that create novel insights and address key regional, national and global challenges. To support this, all research activity will be delivered through our centres of research excellence in the Humanities & Social Sciences, Design & Contemporary Arts Practice, and Manufacturing, Construction & Applied Computing.

Humanities and Social Sciences

- Centre of Humanities and Social Sciences
- Centre for Advanced Welsh and Celtic Studies
- Centre for Research in Education, Curriculum and Pedagogy
- Centre for Education Policy Review and Analysis
- International Institute for Creative Entrepreneurial Development
- Wales Academy for Health and Physical Literacy
- Wales Academy for Professional Practice and Applied Research
- The Psychological Evaluation and Research Consultancy Hub
- Canolfan Tir Glas

Design and Contemporary Arts Practice

- Swansea College of Art
- Assistive Technologies Innovation Centre
- Cerebra Innovation Centre

Manufacturing, Construction and Applied Computing

- The Wales Institute of Digital Information
- Wales Centre for Advanced Batch Manufacture
- SMART Digital Accelerator
- NDT Validation Centre
- Construction Wales Innovation Centre
- Computing Research and Innovation Centre

Implement detailed plans to maximise the economic, environmental and societal impact of our research.



Supported by the newly established Institute for Sustainable Practice, Innovation, Research & Enterprise (INSPIRE), the University will strengthen its research, innovation and knowledge exchange infrastructure and implement the Knowledge Exchange Concordat so we can effectively and safely collaborate with partners in Wales, the UK and internationally. We will take measures to diversify and increase the University's portfolio of research and innovation funding, including IP exploitation and commercialisation.

- Research Division. This unit will provide expert support for developing the University's research portfolio. The team will support academics University-wide with research governance and management. The unit will offer expert bid development services to diversify our funding based and run the newly launched Research and Innovation Accelerator Programme (RIAP), to build strength, depth and breadth in our collaborative research.

Support growth and excellence in commercialisation & income generation

A key strategic aim of the University is to broaden the income base and element of this is commercialisation and income generation from the exploitation of intellectual property. This may manifest itself in many ways such as, the growth of contract research and consultancy with industry, business, public or third sector organisations; an increase in the number of businesses accessing financial support for innovation in collaboration with the University; growth in the number of spinout companies, licensing agreements and other IP income. We will also continue to grow start-ups and spin out businesses launched by our researchers and students delivering:

- An expanded portfolio of contract research and consultancy services across all research centres, with clear and simplified processes for access, delivery and quality assurance.
- Launch the UWTSD Futures Fund offering expert support and seed funding for spin out companies and start-ups.
- A restructured commercial division within INSPIRE will provide expert innovation advice to industry, business, and other organisations. By working in

- Commercial Division. The Commercial Division will maximise the University's ability to attract and generate diverse sources of income nationally and internationally. The unit will focus on employer and industry engagement, Knowledge Transfer Partnerships, collaborative research, commercial contracts, continuing professional development, and technology transfer activity to achieve commercial diversification. This unit will integrate its initiatives into the University's broader portfolio of regional regeneration activities to ensure future sustainability.
- Enterprise Division. To reinforce and grow the University's status as one of the leading universities for staff and student start-ups, the Enterprise Division are responsible for delivering UWTSD's Futures Fund. This investment fund will support innovative and commercially minded staff and students to grow an idea or start-up, spin-in/out a business. To complement this programme, the team will continue to deliver enterprise and entrepreneurship education across the University.
- Civic Engagement Division. The team will lead on developing and supporting the University's Civic Mission goals by embedding the Well-being and Future Generations (Wales) Act 2015 and the United Nations' Sustainable Development Goals across the University's Research and Knowledge Exchange Activity.

partnership with our research centres and industry, we will support organisations in their innovation management practices, facilitating access to training and support, as well as grant funded innovation programmes, such as Innovate UK and KTP opportunities.





Deliver sustained economic growth through research informed high-level skills development, CPD & lifelong learning.

The University is committed to the translation of research to enhance the development of high-level skills, which are an important driver of productivity in rapidly changing workplaces. With a focus on flexibility, inclusivity and resilience, our research centres will develop new higher-level technical or professional skills development programmes including doctoral level study, micro-credentials, CPD programmes, work-based learning and other professional skills training. These will support the development of a resilient workforce and society. We will:

- Develop an expanded portfolio of Degree Apprenticeships across our research programmes.
- Continue to develop taught and research based postgraduate programmes in collaboration with our partners, across education, heritage, and healthcare sectors, as well as industry and business. Our programs will be co-developed with, and directly respond to, partners' training and knowledge-based needs, offering flexible delivery options and entry points.
- Develop a broad portfolio of Micro Credentials based upon the expertise related to our wider research centres and projects.



**A People Centred Strategy
Research is delivered by people - academic, postgraduate, professional and administrative staff from across the University. People working together, collaborating, and sharing either in loose alliances or in tight focused teams. Our strategy therefore places people at its centre with a commitment to support and nurture researchers at all stages of their career and to recruiting, retaining and developing people with the highest potential. We will:**

Incentivise, support and reward staff who undertake excellent research, knowledge exchange and innovation activity.

The University is a signatory to the revised (2019) Concordat to Support the Career Development of Researchers which confirms our commitment to create the very best culture for our researchers to thrive. In signing up to Concordat, the University has committed to support and reward staff for excellent achievements in research, knowledge exchange and innovation activity. In delivering the strategy we will take steps to ensure that we:

- Attract, support, train and develop researchers from all backgrounds at all stages in their careers by launching a fully resourced Researcher Development Programme.
- Ensure researchers have the capacity, support and resources to carry out excellent research by establishing the Research and Impact Accelerator Programme (RIAP), as well as participating in

Welsh schemes such as Taith and the Wales Innovation Network. Foster a research environment that is inspiring, intellectually challenging, inclusive, collegiate, and promotes collaboration, and which ensures that our commitment to equality, diversity and inclusion is embedded in all that we do.

Develop a world class doctoral training environment through the Doctoral College.

UWTSO has a strong and growing community of research degree candidates from a broad spectrum of disciplines and professional practices. They come from diverse backgrounds and are globally dispersed. We also provide one of the most diverse portfolios of PhDs and Professional Doctorates programmes in Wales. To meet these needs, postgraduate research across the University has been significantly strengthened by the launch of the Doctoral College which provides a world-class infrastructure for driving innovation and growth in our provision. The next phase of development will:

- Continue to develop innovative professional doctoral programmes which meet the needs of employers and the professions.
- Develop an outstanding researcher developer programme that equips candidates with research and innovation capabilities that extend beyond their discipline specific research skills.
- Build strength and depth

in collaborative doctoral programmers and partnerships through established channels (UK Research Councils, KESS, Marie Skłodowska-Curie Actions) and bespoke schemes with our research partners.

Develop a Research Action Plan for the Welsh Language

UWTSO continues to support the development of systems which allow for a thriving Welsh medium and bilingual research environment across a range of disciplines. This ensures that our collaborations and partnerships reflect the bilingual context locally and nationally and are fully aligned with the Well-being of Future Generations goals and the Welsh Government's Cymraeg 2050 Strategy. As a commitment to these priorities, UWTSO is developing a Research Action Plan for the Welsh Language. As a cross-cutting theme, relevant to all the University's research and innovation activity, the plan will develop measures to:

- Maximise opportunities to develop a robust, resilient and sustainable Welsh medium research base.
- Make a confident contribution to the regions of Wales, ensuring that where possible research involves active engagement with local communities and partners through the Welsh medium.
- Ensure that our knowledge exchange activities are where appropriate fully bilingual, maximising innovation, enterprise and entrepreneurship activity for Welsh speaking businesses and communities.

Make a significant contribution to Regional Regeneration in Wales

Regeneration is part of the DNA of the University, and each research centre is committed to working with our Local Authority partners on regeneration projects through the city and regional growth deals, or through other sources.

Experience gained through successive ERDF projects will translate into the development of future activities to support growth in the region. We will:

- Continue to work on regeneration projects, developing a portfolio of funded programmes encompassing the full spectrum of regeneration activity, for example: economic development, the upgrading of the built and natural environments, new infrastructure projects, support for the heritage, tourism, cultural and arts sectors, interventions to improve health and wellbeing, and the provision of targeted education, skills development and training in specific areas of need.
- Work with our local authority partners on regeneration projects through the city and regional growth deals, the UK Shared Prosperity and Levelling-Up Funds, as well as successor schemes to the Rural Development Programme.
- Further develop our relationship with charitable sources and trusts, such as the Heritage Lottery Fund and the Princes Trust, Arts Council Wales and Race Council Cymru.



Our research in action

Medical Solutions: Centre for Advanced Batch Manufacturing (CBM).

UWTSD's Centre for Advanced Batch Manufacturing (CBM) was established in 2014 and is a leading authority in Advanced Manufacture specialising in industry focused advanced research, product development and batch manufacturing. CBM Medical has obtained ISO 13485:2016 & EN ISO 13485:2016 for the Design and Manufacture of custom-made 3D-Printed surgical guides and implants placing it in an almost unique situation in the UK medical R&D space.

Research, undertaken in collaboration with British veterinary specialists is helping to treat Osteosarcoma, the most common type of bone cancer in dogs. The research involves the design and development of bespoke surgical devices for the efficient treatment of the disease in large breed dogs and the creation of bespoke orthopaedic implants for small dogs. The main impacts arising from the research are the development and adoption by surgeons of a 3D virtual surgery planning system, and in the design optimisation of two types of surgical devices: custom implants and cutting guides. Both procedures are now recognised in surgical practice, achieve enhanced surgical outcomes, and reduce surgical time by up to 50%.



Research by the University's Cerebra Innovation Centre (CIC)

Research by the University's Cerebra Innovation Centre (CIC) is helping to improve the lives of children with neurodevelopmental conditions.

Led by Dr Ross Head, in partnership with national charity Cerebra, the Cerebra Innovation Centre (CIC) designs and manufactures bespoke equipment for children with brain conditions where there is a shortfall in market-available products.

The CIC team comprises three product designers who take requests from parents, occupational therapists, physiotherapists and teachers of children with complex needs and respond with innovative design solutions to solve the problem. The products have been as simple as highly protective cases for computing equipment to a complete suite of sports equipment to enable a child to participate in triathlon races. The work of CIC has attracted national media interest and was awarded the Saint David's award for Science and Innovation 2019.

Typically, the team take a user centred design approach in order that the precise needs of that individual form the basis for the research and design. CIC have a proven track record of product commercialisation on a licencing basis, seeing product sales of their Goto Seat (over 10,000 units) and Scoot Seat in most developed countries. Each sale of these seats will have a transformative effect on the lives of the children who use it.



Research is being conducted on new and updated entries by the team at the University's Centre for Advanced Welsh and Celtic Studies for Geiriadur Prifysgol Cymru (GPC), a historical dictionary similar to the Oxford English Dictionary, the acknowledged authority on the spelling, derivation and meaning of Welsh words.

The Centre for Advanced Welsh and Celtic Studies is a dedicated research institute located alongside the National Library of Wales in Aberystwyth. It carries out collaborative research projects into the language, literature and history of Wales and the other Celtic countries. One of the Centre's most important research projects is Geiriadur Prifysgol Cymru (GPC), a historical dictionary similar to the Oxford English Dictionary. It is the acknowledged authority on the spelling, derivation and meaning of Welsh words. Commenced nearly a hundred years ago, the first edition was completed in 2002. It was one of only a handful of humanities projects included in Eureka UK!, a volume published by Universities UK in 2006 listing "100 discoveries and developments in UK universities that have changed the world over the last fifty years". It is now largely funded by the Welsh Government acknowledging its importance as an essential element of the linguistic infrastructure for achieving its target of a million Welsh speakers by 2050. It is being expanded and revised comprehensively, and since 2014 has been available free online where it is consulted several million times a year from around the world. It is the largest dictionary in any language that is available as a free smartphone app, making the eight-million-word text available anywhere even without a mobile or WiFi connection.

Research led by Dr Nalda Wainwright, undertaken at UWTSD's Wales Academy for Health and Physical Literacy (WAHPL) identified a gap in the development of pupils' motor skills in the Foundation Phase in Wales.

To address this WAHPL developed and evaluated a programme of professional development in schools and pre-school settings. Successful Kinaesthetic Instruction for Pre-schoolers in Wales (SKIP-Cymru) has trained almost 1,000 teachers, early years practitioners, coaches, and parents to be able to improve the physical competence of children in their care. The programme has gained national recognition as a recommendation in the Health and Social Care Committee report on physical activity and as a best practice case study featured in the Well-being of Future Generations (Wales) Act 2015 support materials. In 2019, following publication of research evaluating the success of SKIP-Cymru, Welsh Government accepted that Fundamental Motor Skills need to be taught at an early age, and that these should be provided for in the new National Curriculum for Wales.

Research by Dr Rebekah Humphreys was fundamental in providing the ethical grounds for the Wild Animals and Circuses (Wales) Bill, which was passed on July 17, 2020.

The subsequent Wild Animals and Circuses (Wales) Act 2020, which became law by Royal Assent on September 7, 2020, makes it an offence for a wild animal to be used in a travelling circus. This primary legislation aligns Welsh law with that in England, Scotland, and globally, 33 countries that have nationwide bans on the use of import/export of some or all wild animals in circuses, including 18 EU member states. Fundamentally, ethical grounds based on Dr Humphreys' research on applied animal ethics were put forward in defence of the Bill. Dr Humphreys' work forms part of the long history of debate surrounding animal ethics informed by science.

Strata Florida, a former Cistercian Abbey with great spiritual presence, is a major religious site of great antiquity research by UWTSD and the Strata Florida Trust, led by Professor David Austin, has raised, through enhanced narratives, national and international awareness of the importance and potential of Strata Florida's iconic place in the nation's history and culture.

Running since 1999 the Strata Florida project is centred on a former Cistercian Abbey and its estate in mid-Wales, a small part of which is consolidated as a Cadw guardianship monument. The research has addressed global themes including identity, status, territory, environment, production, spirituality and nature/culture interaction. The project, and this research, has fed into a sustainable programme of conservation and economic regeneration in the Tregaron Ward of West Wales, a region of well-documented rural deprivation. This heritage development has been carried out by the Strata Florida Trust, which was created out of the research programme by Professor Austin.

The project as a whole has safeguarded the future of five historic, listed buildings to create the Strata Florida Centre for the study and dissemination of Welsh history, culture and landscape as an active business. This has been further endorsed by the whole project being adopted as a site of world importance by the World Monuments Fund while Cadw has now recognised the site as one of the ten most important historic monuments in Wales. The project has received funding from a large number of public and private sources, including a major grant from the Arts and Humanities Research Council through the UKRI Landscape Decisions Programme.

The Pilgrim, a 3-metre high sculpture by Glenn Morris, funded by the research programme and by community donations, overlooking the site of Strata Florida (right-hand side).





Entrepreneurial education across all levels and disciplines has advanced significantly through the research, practice and interventions of the International Institute for Creative Entrepreneurial Development (IICED).

Entrepreneurship is a priority agenda for policymakers across the globe, yet there had been acknowledged dearth of underpinning research for developing the competencies of creativity within the extant literature.

IICED's research, led by Professor Andrew Penaluna and Dr Kathryn Penaluna, has addressed this gap producing a body of research directly informing national education curricula and guidance in the UK, such as the Quality Assurance Agency's Education, Enterprise and Entrepreneurship Guidance, and the Welsh Government's National Curriculum for Wales Areas of Learning Experience. At a European level, this work has directly informed the European Union's EntreComp:

The Entrepreneurship Competence Framework as well as UN and World bank curricular developments in the Balkans. The work has also been influential in China, informing government directives to embed enterprise and entrepreneurship education into all Higher Education Institutions.

Research undertaken by a team led by Dr Ceri Phelps, Academic Director of Psychology and Counselling at UWTSU, and Ann M Baker, Clinical Nurse Specialist in breast cancer care at Southwest Wales Cancer Centre, Swansea Bay University Health Board is supporting individuals living with secondary breast cancer, improving awareness, conversations, and care.

The psychosocial impact of a diagnosis of incurable cancer can be devastating. The research has improved our understanding of the unmet information and support needs of women living with secondary breast cancer. It has helped create Wales's first secondary breast cancer nurse specialist post, facilitated the creation of a patient-led support group, informed two secondary breast cancer conferences and has been instrumental in raising awareness of the impact of living with incurable cancer, including recognition at an event held in Parliament.



“Teithwyr Chwilfrydig”

Dr Johnson a Thomas Pennant ar Daith
Arddangosfa yn Nhŷ Dr Johnson, Llundain

The University of Wales Centre for Advanced Welsh and Celtic Studies (CAWCS) has participated in two linked AHRC-funded research projects focused on travel writing and have directly benefited the heritage, tourism, arts and education sectors in Wales. CAWCS research was led by Professor Mary-Ann Constantine, Dr. Elizabeth Edwards, Dr. Ffion Jones and Dr. Heather Williams.

The heritage, tourism, arts and education sectors are renowned for the breadth and scope, encompassing major museums, archives and galleries, but also smaller heritage organisations and community led initiatives. Each of these play a central role in the country's heritage tourist economy and are a significant driver of economic growth, regeneration and community well-being. While academic research makes a significant contribution to the wider heritage sector, barriers remain in the capacity of smaller heritage organisations, often located away from major metropolitan centres, to access new research and to develop innovative models of public engagement. Responding to these barriers, the work of the AHRC funded European Travellers to Wales and Curious Travellers projects has a) helped to build sustainable collaborative capacity in and between national institutions in Wales and smaller scale heritage organisations, practitioners and communities and b) enhanced public engagement by enabling access to major research-driven public-facing outputs. This has facilitated wider, better-informed and more inclusive public access through collaboratively developed digital heritage tools, educational resources and creative practice. Finally, the research was used to lever further additional investment from the European Regional Development Fund to support the heritage and tourism sectors in West Wales and Ireland.

The research team, led by Professor Constantine at CAWCS, in collaboration with the University of Glasgow and the Natural History Museum, were awarded a third major AHRC grant for this in Sept 2022 (£812,301), for a project entitled: Curious Travellers: Digital Editions of Thomas Pennant's Tours of Scotland and Wales.



Centre of Humanities and Social Sciences (CHSS)

The Lampeter campus has a long history of teaching theology and religion in Wales. Since the granting of the Royal Charter in 1822, Theology and Biblical Studies were at the core of St David's College (latterly University of Wales Lampeter), later supplemented by the inclusion of the study of Religions, Islamic Studies, Philosophy of Religion, and Ethics.

In addition, Lampeter has a rich tradition in Classics, Archaeology, History, Anthropology, Philosophy and other subjects in the Humanities and maintains a national and international profile in these areas. These are now organised in the Centre of Humanities and Social Sciences (CHSS), which includes the UNESCO Bridges Hub, the Alister Hardy Religious Experience Research Centre (RERC), the Sophia Centre for the Study of Cosmology in Culture, the Harmony Institute, and the Academy of Sinology. Humanities research across these is focused on the following five areas:

- Modern Theology, Religion, and Ethics. Research in modern theology, religion, and ethics is carried out around social justice, environmental philosophy, and religious activism.
- Text, Narrative and Reception. Research on text, narrative and reception focuses on the intersection of texts and the contexts from which they emerge – religious, social and cultural, such as the development of early Christianity within its historical context.
- Heritage, Modern and Medieval History, and Religious History. Research examines tangible and intangible evidence of past people's lives and the ways in which these can be engaged with, protected, conserved and stewarded for the future.
- Anthropology, Archaeology and the Intersection Between People and the Material World. Research

in this area focuses on the ways in which objects and materials shape human experiences and explores how materials and matter (including humans) interact to create the world we live in.

- Literature, Language and Communication. Research spans from textual exegesis to critical theory, and crosses time, from ancient Egypt and early Greek narrative to modern performance, passing through the literatures of the Roman Empire, the Chinese world, the Middle Ages, and the Early Modern period up to issues around Multilingualism in a global society.

Centre for Advanced Welsh and Celtic Studies (CAWCS)

The Centre for Advanced Welsh and Celtic Studies was first established by the University of Wales (UW) in 1985. CAWCS is unique within the UK as the only dedicated research centre in the field of Celtic Studies, specialising in long-term, team-based projects.

It has a strong track record of attracting external research funding across its fields of specialization and is home to the University of Wales Dictionary of the Welsh Language (established in 1921). It has a growing body of doctoral students across its research areas. Partnerships have been increasingly important, those with other academic institutions adding interdisciplinary and international dimensions to its research, and those with public bodies and community associations being a vital element in its impact strategy. Research is focused on the following thematic areas:

- Early Celtic Linguistics
- Medieval Welsh Poetry and Texts
- Hagiography
- Name Studies
- Visual Culture
- Enlightenment and Romanticism (in relation to Wales and the Celtic Countries)
- Welsh Lexicography
- Minority / Minoritised Languages, Linguistic Diversity,
- Literary Translation and multilingual intercultural exchange
- Contemporary Connections between Wales and the Celtic Countries

Centre for Research in Education, Curriculum and Pedagogy (CRECP)

Work in CRECP focuses on four education-facing research strands which focus on enhancing understanding of progression in learning with specific reference to the Curriculum for Wales. CRECP also includes Canolfan Peniarth, one of the leading creators and publishers of Welsh and bilingual educational books and resources in Wales.

- Curriculum and Progression focuses research on enhancing understanding about progression in learning, with specific reference to the new national curriculum for Wales, and relevance internationally.
- Early Years research focuses on early learning and attachment, and issues of professional learning and policy for the ECEC sector and engages with practice-facing partners to ensure direct impact on pedagogies adopted across the region.
- Professional Learning and Pedagogical Enquiry in Education involves a research programme tied to the multiple school-based partnerships that are part of this stream of activity in which professional approaches to pedagogical enquiry in school settings are developed.
- Social Justice and Wellbeing, explores well-being through a social justice lens, promoting equitable and sustainable societies and communities.

Centre for Education Policy Review and Analysis (CEPRA)

CEPRA was established in August 2018 to contribute meaningfully to the development and debate of education policy in Wales.

The Centre offers considered and constructive commentary on policy developments that is supported by commissioned research (principally from Welsh Government), rapid reviews and consultancy on a range of topics, including professional learning in Wales, curriculum development and attainment gaps.

International Institute for Creative Entrepreneurial Development (IICED)

IICED was established within UWTSD to be an international focal point bringing together a distinguished group of international experts in entrepreneurial education to engage in high-level discussions and to consider global perspectives that can impact, or have impacted, on policymaking.

The Institute's researchers are actively engaged in developing international best practice in enterprise, entrepreneurship and entrepreneurial teaching, learning and evaluation. The team are acknowledged experts in developing learning environments that enhance innovation and creativity capacity within learners.

Wales Academy for Health and Physical Literacy (WAHPL)

WAHPL focusses on interdisciplinary research into physical literacy and its relationship to education and public health, drawing on early childhood development, education, physiology, psychology and health.

The strategic aim is to understand how to support physical literacy across life and maintain health from policy to practice. Research spans the life course by working with parents, pre-schools and schools to support physical development in early childhood, and approaches to tackle obesity in youth. The Centre for Healthy Aging, located within the Academy, has a strong international profile for research in physical education and literacy at the later stage of the life-course. Research has investigated how to support physical activity in older age and developed programmes supporting an aging population to maintain functional movement.

Wales Academy for Professional Practice and Applied Research (WAPPAR)

The Wales Academy for Professional Practice and Applied Research (WAPPAR) is an established leader in the field of professional doctorates and work-based learning.

Work here centres on research into approaches to pedagogy and curriculum development for work-based learners and practice researchers from levels 4 to 8, approaches to change and development in work for the individual through coaching and mentoring progressing to organisation-wide coaching interventions.

The Psychological Evaluation and Research Consultancy Hub (PERCH)

The Psychology unit has operated as a distinct research discipline with expertise in experimental and applied psychology since 2015.

Research is focused on four main areas of: Psychological Health and Wellbeing; Social, Group, and Political Psychology; The Psychology of Teaching and Learning; and Applied Cognition. PERCH has established a track record of working in collaboration with a number of organisations such as the NHS and Welsh Government, as well as charities and third-sector organisations such as Tenovus Cancer Care, Race Council Cymru, and the African Centre.

Swansea College of Art

The Swansea College of Art has a long and established record of excellence in practice-based research drawing on interdisciplinary and collaborative research methodologies. Such creative explorations have positioned our research both nationally and internationally, with strong ties to Welsh art and culture and the cultural landscape.

Our innovative contemporary practice is showcased on an international level. Work fits into four broad themes:

- Health and Wellbeing. Collaborative research with healthcare professions and communities to promote health and wellbeing, with particular reference to sexual identity and sexual health.
- Identity and belonging. Socio-geographic themes of identity, community and belonging, these ranging from local site responsive work to global geo-political issues.
- Perceptions and readings. Theoretically informed work based on perceptions and readings, for example audience relationships with creative forms and objects, and also work on drawing, creativity, semiotics and literary criticism.
- Metadesign. Launched in 2019, the Metadesign Research Centre (MDRC) acts as a bridging, collaborative, and creative research space for those working in contemporary arts practice and those in design for life-science, health and wellbeing.



Assistive Technologies Innovation Centre (ATiC)

The Assistive Technologies Innovation Centre –is a unique, multi-modality, state-of-the-art research centre created to support the innovation needs and drive change and transformation in the Life Sciences Sector and NHS in Wales.

ATiC's cutting-edge user experience (UX) and usability engineering (UE) research laboratory is powered by a diverse multi-disciplinary team of artists, designers, architects, scientists & engineers, with a focus on understanding people's needs through user-centred thinking, design research methods and objective physical measurement tools. ATiC provides research and knowledge transfer capabilities across the following fields:

- User Experience, Usability Engineering and Human Computer Interaction
- Behavioural, Cognitive and Affective Response Observation & Measurement
- Physical Performance and Biomechanical Data Capture & Analysis
- 3D Scanning, Data Conversion, 3D Computer Modelling & Optimisation
- Virtual and Augmented Reality Simulation
- 3D Printing, Prototyping & User Testing



The Wales Institute of Digital Information (WIDI)

The Wales Institute of Digital Information is a dynamic strategic alliance.

Since its launch in March 2017, WIDI has created a high energy sustainable institute that is able to move seamlessly between the areas of research, product, and service innovation as well workforce and skill development in the growing world of digital informatics within health and care. Working in the WIDI Partnership, Digital Health and Care Wales (DHCW), the University of Wales Trinity Saint David Group and the University of South Wales, have the knowledge and expertise to enhance digital workforce development in health and care and to establish innovative medical data focussed research projects. WIDI's mission is to:

- Develop applied knowledge through the unique WIDI partnership that will inform applied application underpinned by academic rigour.
- Link digital transformation and usage through research (including Artificial Intelligence, Data Science and Medical Imaging).
- Upskill digital competency in the health and care workforce.
- Produce a generation of digital transformers/leaders.
- Creating a digitally confident population of Wales.

Wales Centre for Advanced Batch Manufacture (CBM)

The Wales Centre for Advanced Batch Manufacturing was established in 2014 and is a leading authority in additive manufacture specialising in industry focused research, product development and batch manufacturing.

The Centre attracted very significant investment in 2018 with £1.72m in funding secured from Welsh Government (WEFO / ERDF) for the RD&I Advanced Design Engineering operation. This team works with SMEs in the area of additive manufacturing technology adoption. The Centre is also currently running two large CPD programmes with funding from the European Social Fund. Industry 4.0 (£2.12m) and International Innovation Masters (£2.3m) which are delivered alongside the research-based ADE, as part of a suite of MADE projects.

SMART Digital Accelerator

The SMART Digital Accelerator is a team of industry expert advisers who work with manufacturers in Wales to help them identify the right technology to boost their bottom line.

The project is funded by Welsh Government, delivered by UWTSO and supported by the Advanced Manufacturing Research Centre Cymru (AMRC Cymru). Research and Innovation expertise is grouped around four key technology families:

- Digital Simulation: Digital Twinning; Augmented Reality (AR); Virtual Reality (VR)
- Automation: Robots; Cobots; Enablers of Mass Customisation (EMC)
- Industrial Digital Technologies: Artificial Intelligence (AI); Big Data; Internet of Things (IoT)
- Connectivity: 5G; Low-power wide-area network (LPWAN); Technology to develop connected, intelligent processes

NDT Validation Centre

UWSTD has an active Non-Destructive Testing (NDT) research group, which is unique in Wales, consisting of a number of ongoing funded collaborative R&D projects with industrial partners.

The University offers the only dedicated NDT postgraduate programme in Europe. The Centre has a growing number of fully funded PhD industrial studentships which are delivered in collaboration with industrial partners. Research has been undertaken on both an industrial and academic basis with particular strength residing in the advanced ultrasonic array signal and image processing and electromagnetic methods research. Gareth W Evans, Julie Evans

Construction Wales Innovation Centre (CWIC)

The Construction Wales Innovation Centre is a leading provider of applied research and specialist training across the pan-Wales construction industry.

CWIC's mission is to collaborate with partners to help the construction sector become a Net Zero industry by championing new technologies and support best practice to future-proof skills. CWIC adopts a cradle to the grave approach from resource sourcing to end use and waste minimisation, drawing together research from architectural design, through to innovative construction manufacture and environmental monitoring. Priority areas are:

- Environmental and Industrial Decarbonisation.
- Application of Digital Technologies in Built and Natural Environments (Reality Capture and 4D BIM).
- Green Infrastructure and Biophilic Design.
- Modern Methods of Construction: Design, Construction and Deconstruction of Buildings using innovative materials and practices, including Welsh Timber Products.

Computing Research and Innovation Centre (CRIC).

The Computing Research and Innovation Centre Computing has the knowledge and expertise to enhance the technological, innovative and digital workforce in all sectors (public & private) through research and innovation projects.

CRIC continues to research and develop various project for WIDI and NHS Wales health boards. Projects include healthcare solutions including AI aided diagnosis, gamification methods to positively modify behaviour related to personal health, fitness and food consumption, augmented reality technology and data analytic models for patient access to health care records. CRIC also works in the area of Immersive Learning, and partners with partners with STEM Cymru to support secondary schools and colleges to significantly improve education and skills development in IT by harnessing the power of technologies such as virtual, augmented and mixed reality. Priority areas are:

- Cybersecurity & Blockchain.
- Machine Learning (ML) & Artificial Intelligence (AI)
- Smart Internet of things (IoT) & Innovative Sensors network.
- Cloud & Software engineering.

Canolfan Tir Glas

Canolfan Tir Glas is an ambitious and collaborative venture that will provide a new direction of travel and impetus for Lampeter and surrounding area.

It aims to create an ecosystem that will support rural infrastructure by bringing people and communities together to co-create a new future for the area. The University and partners will develop centres of excellence to deliver a range of programmes linked to rural skills, sustainability, and resilience. The six key and complementary parts of Canolfan Tir Glas are:

- The Pontfaen Food Village, which will enable UWTSD and discount food retailer Aldi to showcase and celebrate local food produce.
- A Community Food Hub to provide a community facility to develop skills based on local food production.
- The Academy of Contemporary Food Wales to establish a central hub for food education and training, working with partners across Mid and Southwest Wales.
- A Rural Enterprise Hub to promote small businesses working in a rural context, specifically in the food and hospitality industries.
- The Wales Centre for Resilience and Harmony developed in partnership with the Lampeter Resilience Hub to develop courses in areas related to adapting to and counteracting the effects of climate change including in agriculture, horticulture, energy and construction.
- The CWIC Welsh Timber and Building Performance Development Centre in collaboration with Wood Knowledge Wales to provide resources and research to promote modern and sustainable methods of construction with the aim of decarbonising the construction industry in Wales.

Innovation Matrix

The Innovation Matrix will provide a new platform for University research and knowledge exchange to connect with and support cross-sector MNEs, SMEs, microenterprises, entrepreneurs and investors to stimulate commercial growth and create, innovate and inspire the new digitally empowered economy of Wales.

The Innovation Matrix will be a state-of-the-art capital build project led

by the University of Wales Trinity Saint David. The net-zero carbon building, which forms part of the Swansea Bay City Deal, will provide 2,200 sq. m of high-quality floor space, and be situated alongside the University's existing IQ and Y Fforwm buildings in the heart of Swansea's Innovation Quarter. The Innovation Matrix will also provide a vital link into the University's wider Swansea estate, including Technium 1 and 2, The Dylan Thomas Centre, Swansea Business Campus, and the Arts Quarter of Dynevor, ALEX and BBC Building.

The Innovation Matrix has partnership at its heart. Instead of a 'build it and they will come' approach, the University is seeking to establish partnerships from the ground up with MNEs and SMEs backed by collaboration with University Research and Knowledge Exchange Centres and Spin-outs. The unifying factor is a shared commitment to research and the commercialisation of intellectual property based on the application of advanced digital technologies enabled by 5G and the Internet of Things (IoT).





Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Contact us:

Get in touch to find out more about how we can facilitate your research and innovation activity.

Business Engagement. Connect with our staff, research centres, facilities and students to unlock your ideas and create tangible and effective outcomes. From new product development through to scaling up and reaching new markets, UWTSd has the right blend of knowledge and experience to make a difference to your business.

Email: inspire@uwtsd.ac.uk

Research Development. Transform your ideas and research into new projects, partnerships, funding, consultancy and commercialisation opportunities. Our INSPIRE Team also helps to foster new pathways for improvement and engagement through our Research and Impact Accelerator programme (RIAP).

Email: inspire@uwtsd.ac.uk

Enterprise. Translate fledgling ideas into viable business proposals through our enterprise pathway. You can also take these ideas to the next level by applying to join our start-up incubators in Swansea and Carmarthen. We can connect you with placements and work opportunities as well as help you access funding through external competitions and events.

Email: enterprise@uwtsd.ac.uk

Civic Engagement. We're committed to ensure our work has a positive and sustainable impact on society. That is why, as a university, we're involved in numerous initiatives, both as leaders and as partners that are designed to improve the lives of our communities and create a lasting benefit.

Email: volunteering@uwtsd.ac.uk