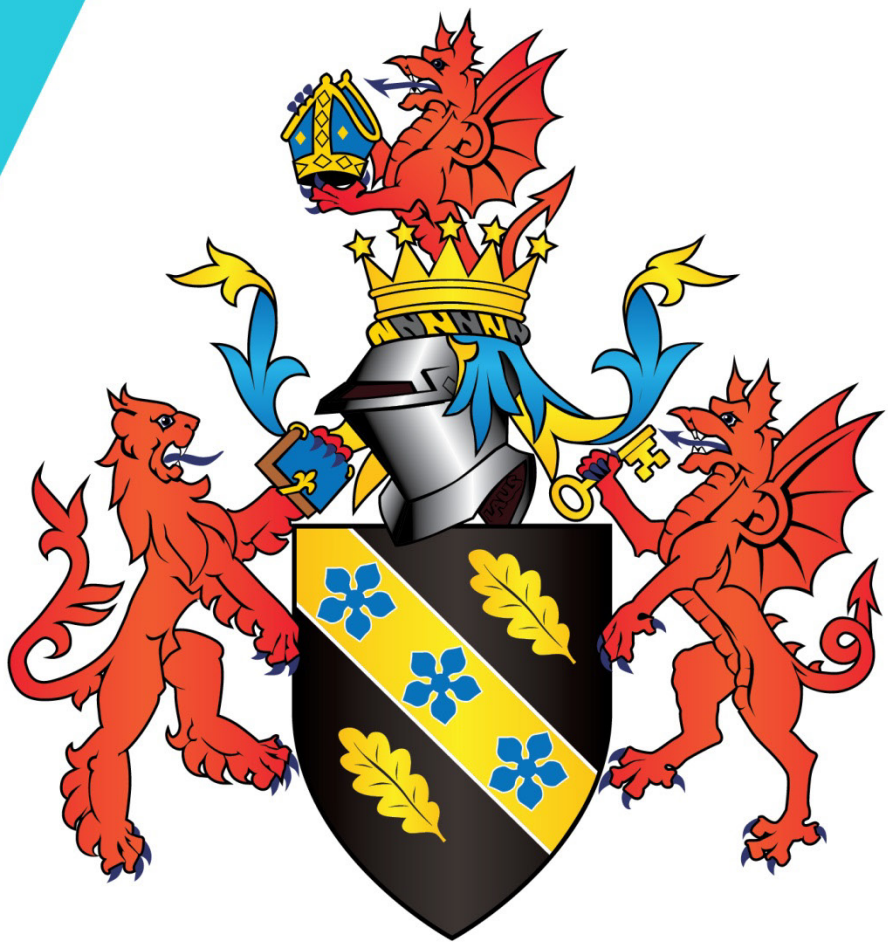
Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David



Research and Innovation Strategy

2022-2027

EXECUTIVE SUMMARY

The University of Wales Trinity Saint David celebrates its bicentenary in 2022. Since 1822 the vision of the University has been to provide accessible higher education, of the highest standard, to the people of the communities it serves. Our aim is to provide the highest quality learning opportunities for our students informed by research and partnership with industry and wider civic society. Our open interdisciplinary approach and entrepreneurial culture enable us to transform people's lives locally and globally.

This comprehensive research strategy is based on an extensive, root and branch, University-wide consultation and dialogue with key external partners and due reference to external policy drivers. The vision is supported by funding from the Research Wales Innovation Fund (RWIF). The vision also builds upon the Universities UK Knowledge Exchange Concordat published in April 2020.

Taken together with an appraisal of the external research environment, the consultation has led to the development of a new strategic framework for the support of research, innovation, enterprise and commercialisation across UWTSD. The strategy builds upon existing areas of excellence but re-focused to strengthen the University's approach to knowledge exchange in the context of a changed world.

This strategy sets out the vision, objectives and planning required to enhance and build the University's international excellence in research and innovation. These underpin the University's capacity for building strong partnerships with industry, civic society and communities, and therefore our ability to achieve excellent economic and social impacts.

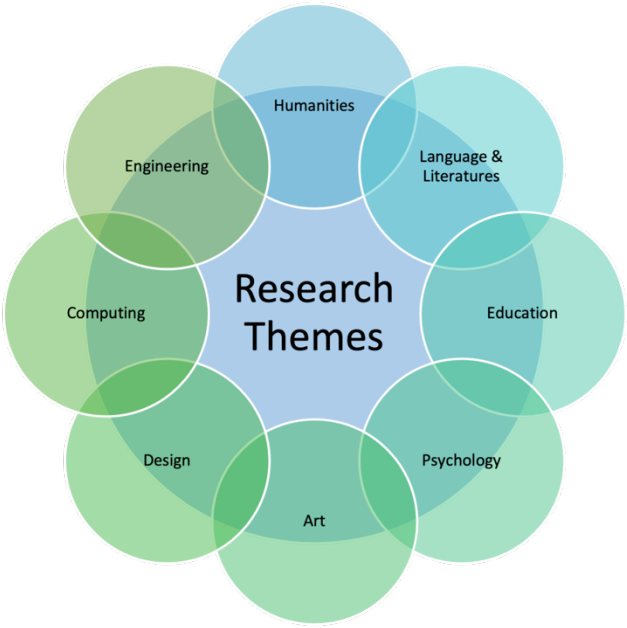
Delivering the Strategy

The strategy sets out top-level plans for each area of research and innovation, with detailed strategic planning documents in the appendices. These will be updated annually in response to evolving opportunities, successes and challenges. Operational planning will be led by the Research Committee supported by INSPIRE, with additional support from other professional services as required. Annual monitoring and reporting arrangements are set out in Appendix 1 and 2.

Research Centres

The strategy identifies seven thematic areas based upon an analysis of REF2021 submissions and a series of SWOT analysis conducted across the University:

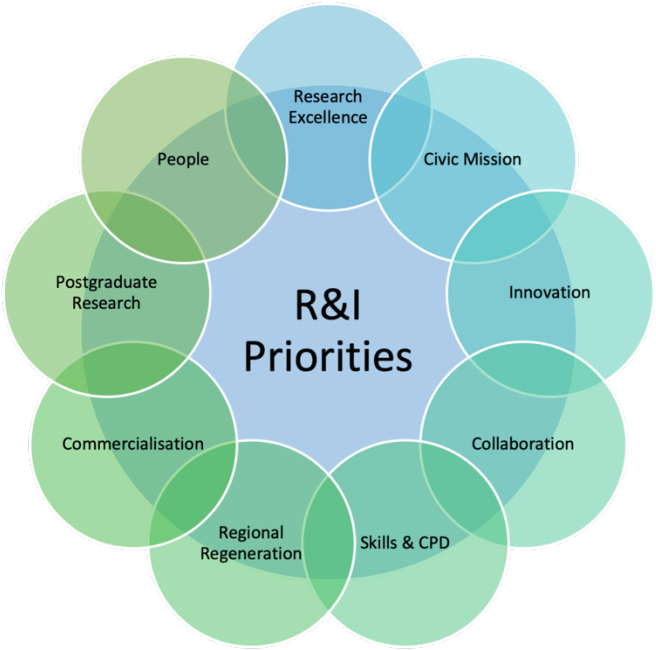
1. Humanities (Lampeter based disciplines)
2. Celtic Languages and Literatures (CAWCS)
3. Social Sciences (Education and Psychology)
4. Contemporary Arts Practice (SCA)
5. Design for Life-Science, Health and Wellbeing (ATiC, CIC)
6. Digital Health Informatics (WIDI)
7. STEM (MADE, CBM, CRIC, CWIC)



Research and Innovation Priorities for 2022-2027

For each thematic research area KPIs are identified against nine research and innovation priorities drawn from University and external policy drivers:

1. Research Excellence
2. Civic Mission
3. Innovation
4. Collaboration
5. High-level Skills, CPD & Lifelong Learning
6. Regional Regeneration
7. Commercialisation & Income Generation
8. Postgraduate Research
9. People



Research Excellence

The University is committed to delivering research excellence as measured by key metrics including: the contribution to developing curiosity-driven discovery research in defined areas; development of challenge-based research in defined areas; securing challenge-led funding; increased applications for all research and knowledge exchange projects; increased funding success rate and the development of an Open Access research environment.

Civic Mission

Civic mission is critical to the delivery of the University's mission. Research areas must demonstrate delivery of projects, initiatives or areas of activity that promote or improve the economic, social, environmental or cultural wellbeing of Wales and beyond as defined in the Universities Wales Civic Mission Framework.

Innovation

Innovation is vital to the success of the University. Demonstrating innovation in practice or process is expected of all research centres. Centres have embedded innovative practices across their research portfolios to maximise the economic, environmental and societal impact of research in defined areas. Research centres or thematic clusters have set out detailed plans and targets for each research area with a renewed focus on the whole spectrum of knowledge exchange activities which are necessary to drive innovation to translate great ideas into value, prosperity, productivity and wellbeing.

Collaboration

The University is built upon collaboration and regards collaboration as critical to most if not all research activity. Each centre or theme has built partnerships by collaborating with researchers, businesses, the public and third sectors. The impact of this is to be seen in collaborative arrangements with other HEIs in Wales and beyond which create critical mass and deliver impact.

High-level Skills, CPD & Lifelong Learning

The University is committed to the translation of research to enhance the development of high-level skills. Each theme or centre has developed higher-level technical or professional skills development programmes including doctoral level study, micro-credentials, CPD programmes, work-based learning and other professional skills training to support the development of a resilient workforce and society. The detailed plans set out within each of our centres is testimony to the depth and richness of the University's research, its engaged nature, and our researchers' commitment to change lives.

Regional Regeneration

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. Emerging sub-strategies will outline the work with partners on regeneration projects supported by UK Shared Prosperity, Levelling-Up Funds.

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. A further measure of success is the number of start-ups and spin out businesses launched by researchers. Each research centre is expected to generate income from commercial activities in addition to grant funding.

Postgraduate Research

Postgraduate Research across the University has been significantly strengthened by the launch of the Doctoral College. The College provides a world-class infrastructure for driving innovation and growth in our PGR provision. Each centre has set out its plans to grow the postgraduate research community across the University.

People

While this strategy identifies key areas of strength in each of our research centres, it also sets out detailed plans for our research infrastructure and professional services. This includes our commitments under the Researcher Development Concordat to incentivise, support and reward staff for excellence in research and innovation. The strategy also sets out detailed plans to strengthen and develop our critical support for effective research and knowledge exchange, as well as our obligations under the knowledge exchange and research integrity concordats. Work in this area will be overseen by the Research committee and undertaken by the Institute for Sustainable Practice, Innovation, Research and Enterprise (INSPIRE). This strategy also includes the essential professional support provided by Library and Learning Resources and Digital Services in support of researchers.

Research Excellence Framework

The strategy focuses on key areas of research excellence, based in each of the University's Institutes and across all campuses. It covers the humanities disciplines based on the Lampeter campus, and the world leading research in Celtic languages and literature at CAWCS, our social science disciplines in education and psychology, work in fine and applied art, and our research in health and industrial design. Linked to these is our work in digital health informatics carried out by the Wales Institute for Digital Information and the broad array of emerging industry linked STEM research activities in WISA.

REF Planning

The strategy does not set out the case for specific research areas to be included in the next REF. The strategy is effectively a framework within which research centres can thrive. The strategy has been developed using the detailed intelligence compiled in the preparation of our REF2021 submissions, the outcomes of which will be announced in May 2022. The

planning cycle adopted aligns with the next REF cycle, for which detailed monitoring arrangements and success measures have been compiled. Although not an end in itself, this forms a critical benchmarking function, as well as a key driver of reputation, esteem and performance.

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. This strategy therefore places people at its centre and a commitment to support and nurture researchers (resource permitting) at all stages of their career and to recruiting, retaining and developing people with the highest potential.

The University has a rich heritage of delivering accessible opportunities to those who pass through its doors. In that spirit, this strategy demonstrates a commitment to creating an inclusive and diverse research environment. It sets SMART targets for research centres and individual researchers and creates a supportive culture for applied research and innovation to thrive.

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CONTEXT

1. Introduction and Scope

The Research and Innovation Strategy 2022-2027 provides succession to the UWTSD Research Strategy 2018. The Strategy complements and supports the University's Strategic Plan 2017-2022, in particular Strategic Priority 2: Excellence in Teaching, Scholarship and Applied Research and Strategic Priority 3: Creation of Opportunities through Partnerships and Strategic Priority 4: A University for Wales.

Specifically, in respect of:

- Maintaining and enhancing the international excellence of research and innovation;
- Maximising opportunities for all staff and learners to engage in scholarship, professional practice, applied research and commercialisation activities;
- Maintaining the high academic standards of our awards, and continue to participate in external assessments of teaching and research excellence;
- Supporting the economic development of the region through strategic engagement with business and civic partners;
- Continuing to work closely with the local authorities where we have campuses to maximise benefits through geographical partnerships;
- Actively engaging with public bodies and Public Services Boards across Wales, focusing on our shared commitment to the seven goals and five ways of working of the Well-Being of Future Generations (Wales) Act 2015;
- Continuing to develop programmes and research focused on protection and enhancement of the environment and natural resources;
- Contributing to the health of Wales through continued development of programmes and research focused on physical and mental wellbeing;
- Contributing to the vibrancy of Welsh culture, visual arts, heritage and language through the continued provision of high-quality Welsh-medium education and activities which encourage community participation in arts, sports and recreation

In addition, the Vice-Chancellor's briefing 2021-22 includes higher level priorities relevant to this strategy, including:

- Diversifying the income base for the institution;
- Identifying commercial opportunities through a focused engagement on priority areas;
- Building our civic engagement opportunities, through for example place-making.

This Strategy aims to support the overall strategic vision of the University by setting out its vision and specific deliverables for research and innovation.

The Strategy will be reviewed in line with changes to the strategic direction of the University and developments to the sector.

2. Vision

Our vision is to be recognised internationally for our centres of research excellence in the following strategic thematic areas:

1. Humanities (Lampeter based disciplines)
2. Celtic Languages and Literatures (CAWCS)
3. Social Sciences (Education and Psychology)
4. Contemporary Arts Practice (SCA)
5. Design for Life-Science, Health and Wellbeing (ATiC, CIC)
6. Digital Health Informatics (WIDI)
7. STEM (MADE, CBM, CRIC, CWIC)

While our centres will continue to undertake investigator defined discovery research, they will also deliver and build expertise in planned programmes of research and knowledge exchange which systematically drive innovation.

This innovation will be delivered through collaborative research partnerships, contract research, IP exploitation and commercialisation. 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.

Our vision therefore is that our researchers, and the professional services that support them, drive innovation: the process that turns great ideas into value, prosperity, productivity and wellbeing. It is this vision that will drive wellbeing and adapt to new opportunities and challenges.

3. Objectives

To achieve our vision, we aim to:

- 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).

To deliver these aims we will:

- Increase knowledge and understanding through our research;
- Implement detailed plans to maximise the economic, environmental and societal impact of our research and ensure that research and innovation plays its fullest role in regional development in Wales;
- Effectively and safely collaborate with partners and networks in Wales, the UK and internationally;
- Deploy RWIF funding to strengthen our research, innovation and knowledge exchange infrastructure and implement the Knowledge Exchange Concordat;

- Diversify and increase the University's portfolio of research and innovation funding, including IP exploitation and commercialisation;
- Review the implementation of the Research Integrity Concordat;
- Incentivise, support and reward staff who undertake excellent research, knowledge exchange and innovation activity by implementing the Concordat to Support the Career Development of Researchers;
- Develop a world class doctoral training environment through the Doctoral College.

4. Background

The strategy builds upon that adopted in 2018. That strategy focused on consolidating existing research centres as the basis of the REF 2021 submission. This was successfully realised, with submissions made in five Units of Assessment, covering the work of 18% of eligible academic staff in the University. This work capitalised on the opportunities inherent within the merged institutions, in particular building upon the strengths of the Wales Centre for Advanced Batch Manufacture and the Centre for Advanced Welsh and Celtic Studies, while also building interdisciplinary research groupings in the areas of education, humanities, art and design, psychology, and engineering. Overall, 49% of UWTSD's research overall was graded 4* (world-leading) or 3* (internationally excellent), with a particularly strong performance in the impact sub-profile, where 74% of the University's research judged as delivering outstanding and very considerable impacts for society, culture, and industry. The results, are as follows:

Profile	4*	3*	2*	1	U/C	4*/3*
Institutional	15	34	37	12	2	49
Outputs	12	29	43	13	2	41
Impact	30	44	19	7	0	74
Environment	3	39	45	13	0	42

Table 1. REF2021 Results

Research, Knowledge Exchange, and Innovation

While the 2018 strategy had a clear vision for knowledge exploitation, this has been strengthened in this new strategy, which detailed plans for research and innovation**.** This responds to the policy and funding context for research in Wales, the UK and Europe, which will support research and institutions that have a clearly defined strategic focus and environment supporting knowledge exchange. This knowledge exchange includes:

- Collaborative research partnerships with industry, business, charity and public sector bodies
- Contract research
- IP exploitation and commercialisation
- Regional regeneration
- Enterprise and business support
- Continuing professional development
- Civic mission and public engagement

In this context, innovation should be understood as:

- The creation and application of new knowledge or creative ideas to improve the world. This may take the form of products, processes, services, technologies, organisational models or other interventions that are made available to markets, governments, organisations or communities.
- Innovation drives human progress by either turning knowledge into value, or by address pressing unmet social and cultural needs. The outcomes of this innovation process are therefore evidenced through a range of social, cultural, and economic impacts.

Policy Context

Over the lifetime of this strategy (by 2023), HEFCW and its functions will be delivered through a new Commission for Tertiary Education and Research (CTER). Funding will reflect Welsh priorities, for example maintaining the benefits of national and institutional links between research, innovation, skills development and teaching.

The launch in 2020 of the new UK wide Knowledge Exchange Concordat, HEFCW's *Research and Innovation: The Vision for Wales* and the re-introduction of core Research and Innovation Funding (RWIF) also reflect the need for investments to support the pathway between research, an effective knowledge exchange infrastructure and innovation.

The University is also a signatory to the revised (2019) Concordat to Support the Career Development of Researchers, which sets out the conditions required to create the very best culture for our researchers to thrive.

The strategy has been developed in response to a detailed policy review, covering:

- Welsh Government, HEFCW and post 2023 CTER policy;
- Westminster Government's UK Research and Development Roadmap, the UK Innovation Strategy and the UK R&D People and Culture Strategy.

Excellence	A research base recognised for its outstanding quality; internationally excellent in identified areas of focus; robust, resilient and sustainable.
Place:	A clear focus on partnership and clusters; a confident contribution to the regions of Wales; a strong sense of civic responsibility; visibility, involvement and active engagement with local communities.
Innovation:	Innovation, enterprise, entrepreneurship and skills development activity that can transform Wales' productivity; new ways of working that support innovative approaches to applied research and partnership funding.
Collaboration:	Research and innovation activity which is delivered jointly by partner universities, further education institutions, business, industry, community partners, the public sector and the third sector, exploiting innovation in delivery and embedding resilience through creative approaches for delivery.

Table 2. HEFCW's Thematic Pillars for Research and Innovation in Wales

Funding Context

This strategy is informed by a review of the principal grant funding sources available to the University. These include:

- Arts and Humanities Research Council
- Economic and Social Research Council
- Engineering and Physical Research Council
- Medical Research Council
- Horizon Europe
- Innovate UK
- SMART Innovation
- Wellcome Trust
- National Institute for Health Research
- Leverhulme Trust
- British Academy
- The Royal Society
- UK Levelling Up Fund
- City deals and other regeneration funds
- Advanced Research and Invention Agency (ARIA)
- Taith: International Learning Exchange Programme

The University has a good track record in securing research, innovation and knowledge exchange funding, although there is significant room for further growth in this area, which will require targeted investment, for example though RWIF.

This is especially important as we have now lost access to the EU Structural and Investment Funds (European Regional Development Fund and European Social Fund), as well as the Erasmus + and Creative Europe programmes, which accounted for more than 50% of our grant income since 2014.

Targeting UKRI and Horizon Europe sources to the same historic levels will require a considerable uplift in the research output of staff as the underpinning criteria of excellence is considerably more challenging in these sources. It will also in the case of Horizon Europe, Innovate UK the UK Research Councils require a more systematic approach to supporting staff in innovation activity through collaborations with business, industry and the public sector.

Delivering the strategy

To operationalise our vision and our objectives, this strategy clearly defines the programmes of research we wish to support in and across each discipline. It sets the framework to develop systematic and robust mechanisms that will allow us to maximise the innovation potential of this research. Our operational plans and vision for the research infrastructure are set out in Parts 5-11, and those for each thematically defined area of research and innovation in Parts 12-19. Documents for monitoring and performance are detailed in appendices 1-5, while detailed reviews and action plans are provided in the appendices 6-16. These will be reviewed and updated on an annual basis.

INFRASTRUCTURE

5. Research Wales Innovation Fund

In March 2019 HEFCW agreed to provide annual funding from 2020/21 in support of a new Research Wales Innovation Fund (RWIF). RWIF has been designed to support the range of knowledge exchange (KE) activities that result in economic and social impact, including the wider civic mission role of institutions. Funding is therefore designed to provide incentives for UWTSD to work with businesses, public and third sector organisations, community bodies and the wider public. While these ambitions inform and are embedded throughout the entirety of this strategy, the University has identified three key strategic areas where RWIF funding will be used to drive ambitious change:

Regeneration & Recovery

UWTSD is investing RWIF funding to target those knowledge exchange activities within four core pillars of applied research linked to regeneration where the University has strengths:

- Computing & Informatics
- Construction
- Health and Wellbeing
- Manufacturing

High-level Skills & Lifelong Learning

Rapid changes in employment trends along with new and emerging employment roles demand individuals to be lifelong learners, adept at up-skilling and continually re-skilling. The University is therefore moving to develop new programmes for those seeking specific higher-level technical skills development in order to enter alternative sector employment. Digital transformation is also impacting our rural communities. Food and farming are recognised as foundational to the Welsh economy and essential to the preservation and development of communities in West Wales.

Culture & Community

Thirdly, the University will target investment to support greater understanding of Wales' culture, its place in the world and its economic value to the country. The first pillar of this has been in the integration of our art, design and performance portfolio into a single cluster. This will support a significant broadening of our existing research and knowledge exchange activities in this area. The second pillar has seen the integration of the internationally recognised work of CAWCS, based in Aberystwyth, with that of the Lampeter based humanities portfolio to create a research cluster of world standing.

Developments in these areas will underpin:

- Commercialisation and income generating activities
- New business growth and skills support
- Civic Mission & Public Engagement

The full RWIF strategy is available at the following webpage:

https://uwtsd.ac.uk/media/uwtsd-website/content-assets/documents/strategies-policies/UWTSD-RWIF-Strategy-21-22-Final-Jan-2022.pdf

6. Investing in Staff

Concordat to Support the Career Development of Researchers.

The University is now a signatory to the revised (2019) Concordat to Support the Career Development of Researchers. The Concordat sets out the conditions required to create the very best culture for our researchers to thrive. In signing up to Concordat, the University has committed to raise the visibility of the Concordat and champion its principles which are to *incentivise*, *support* and *reward* staff for excellent achievements in research, knowledge exchange and innovation activity.

INSPIRE will lead on the development and implementation of the Concordat action plan, working closely with Human Resources, the Institutes and other professional services. The Research Committee will take responsibility for annual review and reporting on progress, and produce an annual report to Senate, including strategic objectives, measures of success, implementation plan and progress. This will subsequently be made publicly available. Researchers will be formally represented in developing and monitoring the University's efforts to implement the Concordat Principles through the Committee and Institute structures.

Research Action Plan for the Welsh Language

UWTSD continues to support the development of systems which allow for a thriving Welsh medium and bilingual research environment across a range of disciplines. This can include ensuring Welsh medium needs are considered at the beginning of the research process in terms of bid proposals, methodological design and the dissemination of research outputs, as well as researcher development and support. It also 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, UWTSD 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:

- Continue our strategic engagement with Coleg Cymraeg Cenedlaethol and other key partners in this field
- Support active engagement in Welsh Medium doctoral networks and international networks in bilingual research environments
- Increase Welsh medium PhD supervisory capacity
- Increase the number of PhD students using Welsh as part of their research projects and/or submitting in Welsh
- Increase the numbers of Prof Doc and Ed Doc students using Welsh in their research projects and/or submitting in Welsh
- Increase the number of applications for PhD scholarships and funding opportunities where Welsh is used
- Establish a Welsh Medium research network within the Doctoral College
- Establish a Welsh Medium mentoring programme for supervisors
- Develop a Welsh medium research network for staff researchers
- Develop best practice training, guidance and resources that maximise Welsh medium and / or fully bilingual research processes, including research methods and data collection, publication, dissemination, knowledge transfer and exploitation.

Aligned to HEFCW's *Research and Innovation: The Vision for Wales* the Action Plan will:

- 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 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.

7. Doctoral College

UWTSD 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 provide one of the most diverse portfolios of PhDs and Professional Doctorates programmes in Wales to meet these needs. The size and characteristics of the student body at these locations presents specific local needs.

As of academic year 2020/21, the University had 566 students enrolled across its traditional PhD programmes and also the DBAs and Professional Doctorates. This presents a firm basis for continued growth and innovation in provision. The Doctoral College, launched in September 2021, will be a key driver in this regard. Key targets and success measures are detailed in this plan.

Doctoral College

The doctoral collage aims to facilitate the growth of our doctoral candidates into excellent researchers by providing the highest level of professional and technical research support to our doctoral community and actively supporting research growth in our centres of research excellence. The doctoral collage achieves this through a unique collaborative hub infrastructure that brings together our postgraduate researchers, their supervisors and the associated support staff from across the University. It enables the development of a research environment for the University as a whole instead of in specific silos thereby enabling all students to access a stimulating and engaging scholarly setting for their work and the exploration of research collaboration and application.

Key functions and priorities are to support the development of innovative research degrees **(PGR2),** seek funding for doctoral candidates in support of research projects **(PGR1, PGR3)** and coordinate and deliver the training and management of research candidates **(PGR4)**. A detailed action plan for the second phase of delivery is provided in Appendix 8. In summary:

The next phase of development will:

- Develop a coherent researcher developer programme that equips candidates with career researcher capabilities beyond their discipline specific research skills.
- Provide a CPD programme for Doctoral Supervisor Development.
- Work with all Institute Research Degree Managers, Research Group leaders and similar to identify, facilitate collaboration around and disseminate events, training and networking contributing to the research environment.

- Consolidate the IT infrastructure of the College to strengthen the reporting, monitoring and sharing of progression and achievement of our candidates.

Collaborations and Partnerships

- **KESS**. The Doctoral College, supported by INSPIRE, will continue engage in discussions for a successor KESS programme, discussions of funding options for which are ongoing (led by Bangor University, with WEFO, Welsh Government and HEFCW regarding funding through the forthcoming Shared Prosperity Funds)**.**
- **UKRI**. The Doctorial College has adopted a target to be involved in two UKRI Doctoral Training Partnerships (DTPs) in the area of innovative doctoral awards**.**
- **Horizon Europe**. The Doctoral College will Co-lead, with relevant research centre and INSPIRE on the submission a minimum of 1-2 funding proposals per annum under the Marie Skłodowska-Curie Actions (MSCA) Doctoral Networks scheme, host 5 MSCA Postdoctoral Fellowships, participate in 5 Staff Exchanges and actively engage in eligible fellowships under the COFUND route (e.g. Welsh Government's Sêr Cymru Fellowship scheme)**.**

Cross Wales Collaboration in Doctoral Candidate and Supervisor Development

- The current working group of universities across Wales seeks to deliver training, support and guidance in the field of wellbeing, training and supervisory positions for Early Career Researchers and Postgraduate Research Students. This initiative is funded by HEFCW and the collaboration is developing a work package with the Learned Society Wales to deliver suitable support to all HEI's involved within the group**.**

8. INSPIRE: The Institute for Sustainable Practice, Innovation, Research and Enterprise.

The University of Wales Trinity Saint David (UWTSD) has integrated the work of Research, Innovation, and Enterprise Services, with its support for sustainable practice (i.e. Civic Mission) to create a new structure that supports the University's Research and Innovation Strategy and Commercialisation agenda.

As a core University function, the Institute for Sustainable Practice, Innovation, Research & Enterprise (INSPIRE) will utilise the University's human and physical assets in a way that maximises the University's ability to attract and generate diverse sources of income nationally and internationally (*SP3 - Creation of Opportunity through Partnerships). INSPIRE will drive the University's knowledge exchange, research, and civic mission strategies, as it:

- **Priority 1:** Supports staff and learners to engage in applied research and commercialisation activities (*SP2 - Excellence in Teaching, Scholarship and Applied Research).
- **Priority 2:** Transforms the businesses and communities we work with through targeted interventions (*SP4 - A University for Wales).
- **Priority 3:** Encourages our entrepreneurs to drive real economic and societal change with novel innovations (*SP4 - A University for Wales).
- **Priority 4:** Enhances the educational experience of UWTSD students as they benefit from the activities INSPIRE fosters (*SP1 - Putting Learners First).

Responding to Higher Education Funding Council for Wales's (HEFCW) Research Wales Innovation Fund (RWIF) priorities, INSPIRE is responsible for four key University pillars:

1. Staff Enterprise, Knowledge Exchange, and Research Development.
2. Business Engagement and Development.
3. Student Enterprise and Innovation.
4. Civic Mission and Community Engagement.

From an operational perspective, INSPIRE's vision is underpinned by a substantial investment from RWIF, core University funds, and commercially generated funds and is structured as follows:

- **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, and through a staff researcher programme, the unit will upskill the University's research competence and capacity. The unit will also offer expert bid development services in collaboration with the Commercial Division. In addition, the team will run the newly launched Research and Innovation Accelerator Programme (RIAP), provide research intelligence, and lead on research infrastructure, policy, and strategy development.
- **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 collaborations, Knowledge

Transfer Partnerships, collaborative research, commercial contracts, and continuing professional development technology transfer activity to achieve commercial diversification. In addition, 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.

INSPIRE will also provide a wrap-around specialist team to support academics and project teams to manage the finances of projects, liaising with external funders pre- and post-claim. In addition, working with internal and external legal advisors to ensure all activities are robust and comply with regulatory frameworks and the law.

The Knowledge Exchange Concordat (KEC)

UWTSD, along with all the HE institutions in Wales, is a signatory to the principles of the Knowledge Exchange Concordat (KEC) (2020), and we have agreed to align to this commitment through our RWIF strategy. The Concordat will ensure that the University maximises its contributions to society and the economy by committing to a strategic, long term approach to knowledge exchange.

The KEC aims to give the University's staff and students clarity of mission, support their development, and give our partners an accurate representation of the approach that we take to knowledge exchange. The Concordat will also provide a clear roadmap of activity, define targets and indicators of performance, and outline areas for improvement. As part of this commitment, we will also take appropriate measures to ensure that the University meets UKRI's (2021) principles for trusted research and innovation, and evolving frameworks from BEIS through the Research Collaboration Advice Team (RCAT). These mechanisms ensure that proper due diligence is undertaken and our international partnerships and open research practices flourish. As part of our RWIF strategy, we have also undertaken a self-evaluation against the concordat's eight guiding principles and the UKRI's due diligence framework. The complete gap analysis, self-evaluation and road map is provided in Appendix 9**,** in addition to HEFCW's top 5 priority actions, which include:

1. Develop Knowledge Exchange Policy.
2. Complete new Research and Innovation Strategy 2022 -2027.
3. Strengthen Intellectual Property expertise.
4. Establish quality management systems to meet and attain ISO 9001 accreditation.
5. CDP plans and training to be implemented for professional and academic staff.

9. Research Integrity and Ethics

The University has updated its ethical guidelines for the conduct of research in terms which meet the 2019 Revised UK Concordat to Support Research Integrity. This has improved accountability and provides assurances to the sponsors, participants, recipients and those who undertake research that robust measures are being taken to support high standards of research integrity and that these conform to generally accepted ethical principles and practices of conduct and governance

The periodic review presented in Appendix 10 was undertaken by the Ethics Committee in September 2021. The following priority actions are identified and will be implemented over the lifetime of this strategy:

1) Improve staff and student training, professional development and support in research ethics
2) Develop a research misconduct policy with clear whistleblowing mechanisms and reporting channels
3) Strengthen procedures for research data management in line with post-Brexit legislation
4) Develop and an ethics review process for staff research

10. Open Research

The University has made good progress in completing the transition to an open research environment and adopted its Open Access and Research Data Management policies in 2016. This also saw the launch of its open access publications repository, the research data repository and a suite of resources to assist staff in working to the evolving open access environment. The launch of the repositories has been supported by advocacy and support from Library and Learning Resources and open access champions in each Institute.

The work programme over the lifetime of this strategy is to complete the following:

- **Transformative Publisher Agreements.** UWTSD Library & Learning Resources have been working with publishers and aggregators for some time in order to transition to more Open Access publishing models where possible. We currently participate in transitional agreements with several different publishers, which cover the cost of article processing charges as part of our subscription. We will continue to work with sector partners to ensure the most cost-effective publishing models and licenses are in place.
- **Repository Software Provision:** UWTSD have maintained institutional research repositories to host open access research since 2008. These repositories allow UWTSD to meet the open access requirements of the Research Excellence Framework and research funders. It also provides a mechanism for Library and Learning Resources to make other University publications, such as theses and research papers, available over the Web. A review, chaired by Head of Collections, LLR, will evaluate current and future needs for repository software and consider the potential for enhanced provision starting in the 2022-23 academic year.
- **Open Access Publishing:** While the University has made progress in its open access publications provision, there are still gaps in awareness, understanding and which need addressing. Working within the new enhanced provision associated with the Researcher Development Concordat and the Doctoral College, LLR will continue to work with the Institutes and Research Centres to raise awareness of open access expectations and fully embed good practice with researchers' publication plans.
- **Research Data:** The University adopted the research data management policy and repository in 2016. While the policy and risk management process has recently been reviewed and updated for data protection (GDPR) LLR will work the research centres, INSPIRE and the doctoral college to embed excellence in research data management into researchers CPD.

11. Digital Services

The objectives of the University's Digital Strategy are to shape the University's digital infrastructure, solutions, and services. These will benefit our student and staff experience and foster a 'digital first' approach to teaching, learning, research, innovation, and collaboration.

Digital Services provides core support to the University's Research and Innovation agenda by providing secure, reliable and accessible IT services and Library and Learning Resources services focussing on open access, research data management and skills development. Furthermore, the Digital Services Strategy develops an approach to innovation and commercialisation across the services both internally and externally.

Digital Services will be informed by the Research Strategy and will work closely with colleagues from across the University to ensure services are developed to support diverse research agendas and will be actively guided by the Research Strategy to deliver research activities linked to digital services and learning technologies, commercially beneficial relationships and innovative digital solutions.

Digital Services provides multi-faceted support to the University's research activity pursuant to this strategy, aligned to several of the strategic aims, objectives, and priorities:

- Advising on and supporting the effective use of technology in teaching and learning and how such technology can be harnessed to improve existing, and drive emergent and innovative, delivery models supports research projects on addressing the challenges and opportunities created post-pandemic **(RE1) (RE2).**

- Training, advice and guidance on improving research skills, digital skills and learning design consultancy on embedding digital confidence and skills within modules, courses and programmes supporting the development of employability, social innovation and entrepreneurship opportunities for undergraduates **(CM2).**

- Identifying and supporting opportunities for educational innovation through new digital pedagogies and application of innovative technologies in a teaching and learning context **(IN1).**

- Making connections between educational programmes and commercial partnerships to support the application and deployment of commercial technology research and development in active teaching and learning contexts **(COL1) (CIG1).**

- The creation, delivery and support of training programmes in relation to digital skills to support a culture of lifelong learning in addition to supporting an institutional blended learning strategy providing flexible and therefore wider access to personal and professional development **(HS1).**

- Building on the digital expertise within the University to enhance or develop new links with industry partners to build external relationships and support commercial opportunities **(COL1) (CIG2).**

- Identifying and developing opportunities for digital innovation across the University and with external partners **(IN1)**

RESEARCH AREAS

12. Humanities

Research Themes and Centres

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. Our staff maintain a national and international profile in these areas. These are now organised in the Centre of Humanities and Social Sciences (CHSS), the Alister Hardy Religious Experience Research Centre (RERC), the Sophia Centre for the Study of Cosmology in Culture and the Harmony Institute.

Humanities research across these centres is focused on the following five areas, which are detailed in Appendix 9:

Modern Theology, Religion, and Ethics: Research in modern theology, religion, and ethics is carried out around social justice, environmental philosophy, and religious activism. Located at the intersection of theology and ethics, it explores, for instance, various religious theories about the moral and spiritual significance of the material world as well as issues around religions in diverse societies.

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. It includes research in Biblical Studies and Classics and explores the ways in which the flow of people, ideas, objects and materials impact on different societies over space and time.

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. Current research foci engage with the religious legacy of Wales, focusing for instance on Welsh monastic houses and investigating the ways in which heritage can be used to drive social and economic regeneration of contemporary communities. Another focus is on the Near East and Egypt, with particular focus on the Aegean and Indian Ocean interconnectivity in ancient Afro-Eurasian world.

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. It investigates current societal concerns with sustainability, climate change, wellbeing and the resilience of future generations. A focus is on globalisation and networks. This research area incorporates two research centres, the Sophia Centre and the Religious Experience Research Centre, and the newly founded Harmony Institute that facilitates and supports critical inquiry and research into concepts of harmony and their application.

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 though 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. Focus is on the spoken and written word. Creative writing publications in prose, poetry and drama sit alongside and are informed by research on contemporary texts and use of language.

REF2021

Humanities research was submitted to REF2021 under UoA 31 (Theology and Religious Studies). The overall rating for world leading and internationally excellent research was 49% with 96% at internationally recognised or better. 75% of the Unit's impact was judged to have outstanding or very considerable impact:

UoA	Profile	FTE	4*	3*	2*	1*	UC	3*/4*
31	**Overall**	**19.75**	**25**	**24**	**47**	**4**	**0**	**49**
	Outputs	19.75	20.4	20.4	53.1	6.1	0	**40.8**
	Impact	19.75	50	25	25	0	0	**75**
	Environment	19.75	0	40	60	0	0	**40**

SWOT Analysis

In preparing the REF201 submission, the following strengths, weaknesses, opportunities, and threats became apparent, as summarised below.

Strengths		Weakness
• Researchers in the unit were very productive in the assessment period, most staff producing more than 5 published outputs, estimated to by at least 3* quality. • Since 2014, 121 research students within the humanities disciplines have successfully been awarded a research degree, and 145 students joined our research degree programmes. New professional doctorates have been successful with funding secured for collaborative provision. • Research has made good contributions to the University's civic mission agenda, contributing to place-making, the regeneration and the local economy, to public engagement and to social innovation though responses to global challenges.	**Internal Factors**	• The majority of staff have less than 30 days a year allocated to research (half at just half a day a week). This leaves little time to develop funding applications and engage in knowledge exchange activities that drive innovation and civic mission outcomes. • While there was a strong portfolio of civic mission activities, a stronger and adequately resourced (social) innovation strategy based on programmed knowledge exchange activity is required to produce substantial research impacts. • While the success rate for funding application is broadly in line with the sector average, 50 of the 82 applications (60%) were submitted by 5 members of staff (17%). The majority of staff submitted just one funding application in the seven-year period 2014 – 2020.
Opportunities		**Threats**
• The strategic priorities of some of the University's research funders present considerable opportunity e.g. Islamic studies ESRC, applied research in environmental ethics and welling, and interfaith studies addressing changing demographics and work to unlock heritage assets. Another area to develop further is linked to the Network to Promote Language Diversity (NPLD) in Brussels. • Staff are actively engaged with research users in outreach activities and impact development. Research in Interfaith and intercultural studies is for example undertaken through close interaction with the Church in Wales, the Muslim Council of Wales, the Chin Kung Foundation, the Evangelical Alliance Wales, and other religious denominations and communities. • Humanities research has also considerable potential for place making through heritage and regeneration.	**External Factors**	• The strategic focus of research in the humanities area show some weakness, driven predominantly by investigator led interests (e.g. curiosity research) rather than by challenge based agendas. • As research policy is increasingly focused on research collaborations, knowledge exchange, civic mission and innovation activity, the emphasis on curiosity driven research (the main outputs of which are publications) should be revisited with a new emphasis on developing larger and defined interdisciplinary and collaborative projects. • The 25 staff with SRR are drawn from distinct humanities disciplines: anthropology (4), history (6), classics (6), philosophy (1), archaeology (5), theology and religious studies (5). The lack of critical mass in each area is therefore significant.

Research and Innovation Priorities for 2022-2027

The following research and innovation priorities will form the basis of Humanities research for the lifetime of this strategy. Detailed plans, success measures and targets are provided in Appendix 9. These will be monitored and updated on an annual basis.

Research Excellence

The Humanities will build upon it's established research excellence to build an expended portfolio of grant funded projects. While investigator defined discovery research will be a continued focus, we will also work to align research to funder-defined research challenges and ensure that the overall portfolio is aligned to stated priorities. We will:

- Develop curiosity-driven discovery research in clearly defined areas, publishing at least 110 outputs of REF standing **(RE1).**
- Develop challenge-based research in defined areas publishing at least 25 outputs of REF standing (**RE2).**
- Target and prioritise challenge-led funding, developing at least 20 applications to challenge based funding schemes or calls **(RE3).**
- Increase applications for all research and knowledge exchange projects. Research staff with SRR will be supported to submit at least three grant applications **(RE4).**
- Increase funding success rate to 65%. All staff with SRR will be incentivised to actively engage in development opportunities supporting project development and grant applications **(RE5).**
- Develop the Open Access research environment, ensuring that REF or funder defined open access compliance rates are at or above 80% **(RE6).**

Civic Mission

The humanities will develop projects and initiatives that engage in the University's civic mission goals by promoting or improving the economic, social, environmental or cultural wellbeing of Wales and beyond (including action that may achieve any of the Wellbeing of Future Generations goals **(CM1).** We will:

- **Strata Florida Trust**. Continue support for Strata Florida Trust and its consolidation.
- **UNESCO.** Collaborate with UNECSO and other bodies on land generation projects with particular attention to water health and revitalising the landscape with water.
- **Welsh museums and archives.** Strengthen research with Welsh museums and archives, research on local saints and other research linked to Wales in order to increase awareness and rise the significance research grounded in Wales. We will also develop further education and outreach programmes with Cyfarthfa Castle Museum and Art Gallery.
- **Interfaith engagement.** Develop further public engagement with Church in Wales, the Muslim Council of Wales, the Chin Kung Foundation, the Evangelical Alliance Wales, and other religious denominations and communities.
- **Religion, health and ethics**. Develop further public engagement with religion, health and ethics which engages with communities on key issues around wellbeing, rights and justice.
- **Canolfan Tir Glas.** Continue developments in Canolfan Tir Glas.

- **Future Generations Wellbeing**. Develop additional initiatives that meet the Future Generations Wellbeing and civic mission goals.

Innovation

The Humanities have identified four areas for the development of societal impact **(IN1)**, which will be supported and developed through targeted impact initiatives:

- **Interfaith.** Impact initiatives will be developed in close partnership with the Muslim Council of Wales, the Chin Kung Foundation, the Evangelical Alliance Wales and other communities and interfaith organisations.
- **Heritage**. In addition to the ongoing work in Strata Florida, Humanities will develop their already established partnership with local museums and archives in South West Wales as well as in other regions, for example in Ireland.
- **Health and wellbeing.** Impact initiatives will be developed around new research on the ethical impacts of COVID-19 as well as spiritual experience of the pandemic and subsequent recovery.
- **Animal and bio ethics**. Building on impact submitted to REF2021, ethics research will continue to develop impact in regard to animals in relation to business practices.

Collaboration

Researchers across the Humanities have built strong partnerships with researchers, the public and third sectors, in Wales, across the UK and internationally **(COL1, COL2).** This activity sustains research excellence, and drives effective knowledge exchange to ensure our research delivers substantial impacts. Thought-out the lifetime of this strategy we will ensure that:

- **Academic Collaboration**. At least three-quarters of humanities staff (with SRR) will be supported to have active research networks in the UK and internationally that involve meaningful academic collaborations, and that they actively participate in opportunities through the Wales Innovation Network, the Learned Society of Wales, and other national networks.
- **Interfaith Collaborations**. We will consolidate existing and develop new partnerships with international and local organisations with regard to interfaith activities**.**
- **Heritage Collaborations**: We will consolidate existing and develop new partnerships with heritage agencies, organisations and businesses.

High-level Skills, CPD & Lifelong Learning

Humanities have led the development of i-Humanities over the last two years, and have developed high-level skills training in archaeological practice. The Humanities will further develop the University's offering in micro-credentials and CPD programmes though Phase 2 of i-Humanities **(HS1)**. This will include:

- A substantial offer of micro-credentials in philosophy, ethics, interfaith studies, and digital Islam.
- Developing micro-credential based post-doctoral training in environmental ethics in partnership with external funding bodies.
- Launching a Masters level pathway for the Archaeological Specialist Apprenticeship.

- Developing CPD and training opportunities for the digital documentation of archaeological ships.

Regional Regeneration

The Humanities will continue to work on regeneration projects, developing a portfolio of funded programmes with regeneration outcomes. These will include 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. We will work with our partners on regeneration projects through the city and regional growth deals (**RR1)**, the UK Shared Prosperity and Levelling-Up Funds, as well as successor schemes to the Rural Development Programme **(RR2)**. We will also further develop our relationship with charitable sources such as the Heritage Lottery Fund and the Princes Trust. Specific projects include:

- **Canolfan Tir Glas.** To support the development of Canolfan Tir Glas to secure the future potential of Lampeter as a regional centre for the local food industry, local sustainability, resilience and enterprise.
- **Strata Florida**. To continue supporting the Strata Florida Trust in its ongoing programme of heritage led regeneration, that has to date contributed an estimated £4.42m GVA to regional development in Ceredigion.
- **Newport Ship**. To continue supporting the Newport Museum and Heritage Service in its regeneration activity in in South East Wales.
- **Cyfarthfa Castle**. To strengthen the collaboration with the Cyfarthfa Castle Museum and Art Gallery in Merthyr Tydfil. Work on their collection helped to secure £3.1 million investment from the Heritage Lottery Fund in Wales, the Welsh Government, CADW and the County Borough Council for a redevelopment of the park in 2016.
- **Portalis.** To develop the Portalis project to support tourism development and public engagement with archaeological sites in Ireland and Wales.

Further projects will be developed in partnership with regional authorities and county councils when details of the UK Shared Prosperity and Levelling-Up Funds, as well as successor schemes to the Rural Development Programme, are announced

Commercialisation & Income Generation

Humanities staff will work with the Executive Director of Commercialisation to develop new income streams for the University **(CIG2)**. This will build up the track record of contract archaeological services. Current areas, and those in development include:

- **UWLAS**. The University of Wales, Lampeter Archaeological Services (UWLAS), established in 2004, draws on staff expertise and resources in Humanities and a network of external organisations and specialists.
- **Overseas Study Centres**. The Centres will initially establish two level 3 programmes (International Foundation and Sinology and Chinese Studies Foundation) as online blended courses, with further MA and BA offerings to be developed in a second phase with partners in China, Taiwan and Malaysia.

Postgraduate Research

There are more than 200 Postgraduate Research students enrolled in Humanities at UWTSD (approx. 50% of the University's total PGR community). Building on this strength and the success with KESS2, Marie Skłodowska-Curie, and other schemes, Humanities has developed two professional doctorate programmes, one in Interfaith studies and one in English Language Education. Over the next 5 years Humanities plan to consolidate further its strength in postgraduate research:

- **Professional Doctorate in Heritage**. Developed in cooperation with CAWCS and key intuitions in Wales, the Professional Doctorate in Heritage will provide support for the cultural heritage sector advancing the state-of-the-art in curatorship and cataloguing; handling artefacts; heritage filmmaking; digital humanities skills; the politics and ethics of heritage; sustainable heritage practices; tourism, commerce and entrepreneurship in the heritage sector; public engagement and visitor experience.
- **European Doctoral Training Partnerships**. Make a minimum of two applications to the Marie Skłodowska-Curie Doctoral Training Partnership programme, and host 3 MSCA Postdoctoral Fellows.
- **UK collaborative doctoral training**. Seek involvement in UKRI collaborative doctoral training programmes and seek to host three doctoral students or postdoctoral position on funded projects.
- **Professional Doctorates.** Consolidate and expand the ProfDoc in Interfaith Studies and ProfDoc in English Language Education.
- **NPLD.** Develop a programme linked to the Network to Promote Language Diversity based in Brussels which represents languages across Europe.
- **PRES.** Improve the quality of the doctoral training environment, increasing PRES scores to at least 90% across all areas.

People

Following the current gap analysis and action plan to implement the Researcher Development Concordat (PE1) the Institute will develop individualised Action Plans with for each research-active member of staff and in cooperation with Staff Development and HR. The target for the next five years is to monitor the implementation closely and to agree on targets annually for each member of staff. In addition, a system will be developed in cooperation with INSPIRE to reward research active staff (e.g., through the allocation of time for research in their Activity Profile).

13. Celtic Languages and Literatures

Research Themes and Centres

The Centre for Advanced Welsh and Celtic Studies (CAWCS) 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

REF 2021

Celtic Languages and Literature research was submitted to REF2021 under UoA 26 (Modern Languages abd Linguistics). The overall rating for world leading and internationally excellent research was 70%. 70% of outputs were judged to be world leading or internationally excellent, while all the Unit's impact was judged to have outstanding or very considerable impact:

UoA	Profile	FTE	4*	3*	2*	1*	UC	3*/4*
26	**Overall**	**11.9**	**28**	**46**	**18**	**8**	**0**	**74**
	Outputs	11.9	20	50	23.3	6.7	0	**70**
	Impact	11.9	50	50	0	0	0	**100**
	Environment	11.9	20	25	27.5	27.5	0	**45**

In preparing the submission, and over the course of the past nine months since submission, the following strengths, weaknesses, opportunities, and threats have become apparent, as summarised in below.

Strengths		Weakness
• CAWCS has a long-standing successful track record in competitive grant capture, high quality outputs and strong research leaders in its research areas. • It works in strategic alignment with public bodies, especially the National Library of Wales, National Museum of Wales, RCAHMW Welsh Government and Arts Council Wales • CAWCS works in close collaboration with academics at other institutions on joint proposals and our relationship with Oxford has been further consolidated through the new Jesus Chair of Celtic. • The primary mission and focus of CAWCS is research, and its team-based, collaborative approach enables the development of multi-researcher, interdisciplinary projects. • Close connections with professionals, networks and community partners, across Wales, in the UK, Europe and internationally.	**Internal Factors**	• Funding is concentrated in quite a selective portfolio of sources. • Funding from the EU Culture and Interreg programs is no longer available and CAWCS has a limited track record in bidding to the EU Framework programmes (e.g. Horizon Europe). • Some research areas require significant succession and sustainability planning in the short and mid-term. • Some research areas are very specialised and cross-over opportunities for researchers between projects can be quite limited. This can impact career development and progression routes for CAWCS staff. • The increase in PhD fees at UWTSD since 2021-2022 makes CAWCS less competitive than other Welsh HEIS for self-funded students without local mitigation (e.g. CAWCS scholarships).
Opportunities		**Threats**
• Expand areas of research and activity to include Literary Translation (LT) and Language Policy and Planning (LPP) • Develop further opportunities for collaboration in the cultural and heritage sectors include work in name studies and cultural history. • Develop activities within a Strategic Alliance with the National Library of Wales, to include a focus on Digital Humanities. • CAWCS has had a small cohort of high-quality PhD. There is opportunity to grow this number to a community. • Contribute to priorities in place making, active citizenship, regional regeneration, collaborative funding and higher skills and continuing professional development. • Alignment with key strategic interventions that can contribute to challenge-led funding priorities as well as The Well-being of Future Generations Act (Wales)	**External Factors**	• The nature of any replacement funding for the Centre's EU funding through the UK Shared Prosperity Funds will be structured through different priorities and mechanisms. This will impact opportunities for PhD studentships as well as projects. • Limited sources of funding for team-based research projects that are important in the Welsh context (but are not recognised by UK level funding bodies to merit major investment) mean that important aspects of the core mission of CAWCS cannot be fulfilled from external funding.

Research and Innovation Priorities for 2022-2028

The following research and innovation priorities will form the basis of Celtic Studies research for the lifetime of this strategy. Detailed plans, success measures and targets are provided in Appendix 10. These will be monitored on an annual basis.

Research Excellence

CAWCS aims to continue to contribute to international scholarly activity in its specialist fields and maintain its recognition as a leading research centre. It will continue with the production of world-class research outputs through the publication of internationally excellent and world-leading books (monographs and edited volumes) published by world-leading publishers, peer-reviewed articles and chapters, as well as online edited resources or collections at REF 3* or above **(RE1, RE2).** We will publish at least 64 outputs which address both investigator defined themes **(RE1)** and also those of challenge based calls **(RE2)**. We anticipate that these will be weighted towards RE1, but will review once BEIS, UKRI and the AHRC publish their renewed delivery plans in 2022. We will also consider the Pillar 2 priorities of future Horizon 2020 work programmes:

- 14 monographs or edited volumes
- 40 chapters or peer reviewed articles
- 10 online edited resources or collections

Research projects

CAWCS research projects are generally multi-partner bids, involving at least two academic institutions and with additional engagement or support of non-academic partners (sector institutions, networks, professional organizations or community associations). Each research area will submit at least one large, multi-researcher funding bid as well as smaller applications to investigator-defined funding schemes **(RE4)** and to challenge-led funding calls **(RE3)**. Our target is to submit 50 applications leading to at least 30 funded projects. We will work with INSPIRE to initiate a peer review process, and for staff to undergo targeted CPD, to increase the success rate to 65% **(RE5).**

- Early Celtic Linguistics (5)
- Medieval Welsh Poetry and Texts (5)
- Hagiography (5)
- Name Studies (5)
- Visual Culture (5)
- Enlightenment and Romanticism (5)
- Welsh Lexicography (5)
- Minority / Minoritised Languages, Linguistic Diversity (5)
- Literary Translation and multilingual intercultural exchange (5)
- Contemporary Connections between Wales and the Celtic Countries (5)

Civic Mission

CAWCS will continue to develop projects and initiatives that engage in the University's civic mission goals **(CM1)** by promoting or improving the economic, social, environmental or cultural wellbeing of Wales and beyond. Projects will include: .

- **Geiriadur Prifysgol Cymru / The University of Wales Dictionary of the Welsh Language** contributes to the Welsh Government's Cymraeg 2050, playing a major part in the linguistic infrastructure of the Welsh language.
- **Strategic Partnership with the National Library of Wales** to bring significant research capacity to enhance NLW's goals and mission.
- **Welsh Place Names,** CAWCS staff are members of the Welsh Language Commissioner's Panel
- **Y Werin Legacy Fund,** providing continuity of scholarly support for the annual lectures and prizes.
- **Ports: Past and Present** is a four-year Interreg project (2019-2023) led by University College Cork, with partners Wexford County Council, UWTSD (CAWCS) and Aberystwyth University, connecting five port towns (Dublin, Rosslare, Holyhead, Fishguard, Pembroke Dock).
- **Reading Wales in Diverse Languages** with Race Council Cymru, Wales PEN Cymru and supported by the Arts Council of Wales, led by Literature Across Frontiers and Wales Literature Exchange
- **Welsh museums, archives and associations – in relation to tangible and intangible culture.** Strengthen research with Welsh museums, archives and grass roots organizations, including the Henry Tudor Trust in Pembroke.
- **UNESCO City of Literature Bid:** CAWCS is a partner in the recently-established consortium, to be submitted by Aberystwyth Town Councill which include Ceredigion County Council, Aberystwyth University, Books Council of Wales, National Library of Wales, Wales PEN Cymru as well as CAWCS.
- **Strata Florida Trust**. CAWCS works (along with **Humanities)** to continue support for Strata Florida Trust in the cultural, conservation and economic regeneration in the Tregaron Ward of West Wales. This has raised awareness of the importance of Strata Florida.
- **Y Bywgraffiadur Cymreig** – **Dictionary of Welsh Biographies** – CAWCS is working with NLW and Race Council Cymru to enhance the diversity of representation of Welsh lives in the DWB. Editor: Prof. Emeritus D. Johnston, Deputy Editor: Prof E H G Jones.
- **Future Generations Wellbeing**. Develop additional initiatives that meet the Future Generations Wellbeing and civic mission goals
- Maintaining strong links and relationships with European organizations such as **European Language Equality Network** (President: DCAWCS), **Network for the Promotion of Linguistic Diversity** (Member), **European Civil Society Platform for Multilingualism** (Member), **Culture Action Europe** (Member).

Social Enterprise, Business Skills and Employability.

CAWCS will explore opportunities to support the University's enterprise agenda **(CM2)**., through for example hosting student impact ambassadors and participating in programmes that support undergraduate knowledge of the heritage, cultural and creative sectors (e.g. commerce and entrepreneurship in the heritage sector through links with the publishing and media industries, national heritage agencies, museums and archives, and the National Eisteddfod).

Innovation (RE5)

CAWCS has developed innovative practices in its research projects and its research outputs, with particular focus on exporting the connections between digitalization and scholarly activity. CAWCS has worked with community groups and associations in developing research capacity

at local levels and internationally. These innovative practices are being implemented across its current activity, such as Ports Past and Present, Literature Across Frontiers, Dictionary of Welsh Biography etc. These developments will continue during the lifetime of this strategy and capacity in Digital Humanities will be further enhanced in this field. We have identified nine areas for the development of societal impact **(IN1)**, which will be supported and developed through thirteen targeted impact initiatives:

- **Welsh lexicography**: linguistic infrastructure of the Welsh language
- **Place Names:** working in connection with heritage agencies and the Welsh language Commissioner
- **Language Policy and Planning**: Minority/ised Languages
- **Multilingualism and literacy:** access to diverse writing and creative/literary translation in communities
- **Community engagement with digital archives:** working in connection with national institutions and communities
- **Early Celtic Languages and Linguistics**
- **Manuscripts, texts and visual art of the Middle Ages**
- **Digital culture and heritage**
- **Trans-regional Trajectories:** contemporary connections between the Celtic Countries

Collaboration

All CAWCS researchers work in collaborative projects and have strong partnerships in their fields of expertise with established and early career researchers, with academic and public institutions and organizations, with associations and community groups in Wales, across the UK and internationally **(COL1)**. Engagement with such organisations will be continued and developed. We aim to have developed 40 active partnerships over the lifetime of this strategy. We will also promote participation in opportunities in the Wales Innovation Network, the Learned Society of Wales, Coleg Cymraeg Cenedlaethol, the Collaborative Research Network other national networks **(COL2)**. CAWCS will also continue with its collaborations with other centres in the University to support research and innovation, and to support a Welsh medium and bilingual research environment.

High-level Skills, CPD & Lifelong Learning

CAWCS has worked with colleagues at UWTSD on the revalidation of MA Bilingualism and Multilingualism and PG Diploma Polisi a Chynllunio Iaith [Language Policy and Planning] which facilitates a Welsh-medium pathway (up to 120/180 credits). The latter will target professionals working in LPP in Wales **(HS1).** The Prof Doc in Heritage, developed in cooperation with the heritage agencies, museums and archives, offer a combination of academic studies and practical training leading to a doctoral qualification, with some modules that can be used as stand-alone CPD relevant micro-credentials **(PGR2)**. In the medium term, CAWCS will

- **Professional Development:** Explore further opportunities which may arise for the development of higher-level skills, CPD and lifelong learning through for example, a Strategic Alliance with NLW to develop Digital Humanities, Heritage and Professional Development (large scale, multi-component)
- **Skills Development**: Develop projects through the UK levelling-Up funds and the City and Regional growth deals. The expertise and track record of Mercator and Literature Across Frontiers offers a sound foundation for the development of these offerings.

Regional Regeneration

CAWCS is working with a wide range of partners in projects of different scales that contribute to regional regeneration **(RR1)**.. Building on past successes in accessing European regeneration funds (e.g. ERDF, ESF, EAFRD) we will work with our partners on regeneration projects through the city and regional growth deals (RR2), the UK Shared Prosperity and Levelling-Up Funds, as well as successor schemes to the Rural Development Programme **(RR2)**. We will also further develop our relationship with charitable sources such as the Heritage Lottery Fund and the Princes Trust. Many of these are listed in CM1. Among those highlighted are:

- **Ports: Past and Present** is a four-year Interreg project (2019-2023) led by University College Cork, with partners Wexford County Council, UWTSD (CAWCS) and Aberystwyth University, connecting five port towns (Dublin, Rosslare, Holyhead, Fishguard, Pembroke Dock).
- **Welsh museums, archives and associations – in relation to tangible and intangible culture.** Strengthen research with Welsh museums, archives and grass roots organizations. CAWCS is currently working with the Henry Tudor Trust in Pembroke, providing academic expertise as it develops the next stages of its business plan for the Henry Tudor Centre.
- **UNESCO City of Literature Bid:** Aberystwyth Town Council is leading a recently-established consortium to prepare the bid. The consortium included Ceredigion County Council, Aberystwyth University, Books Council of Wales, National Library of Wales, Wales PEN Cymru as well as CAWCS.
- **Strata Florida Trust**. CAWCS works (along with Humanities**)** to continue support for Strata Florida Trust in the cultural, conservation and economic regeneration in the Tregaron Ward of West Wales. This has raised awareness of the importance of Strata Florida.
- **Canolfan Tir Glas**. CAWCS has recently started to work with Canolfan Tir Glas on the connections between lexicography and the revivial of craft skills in the context of sustainability, carbon zero environments and cohesive communities, with an application for funding (PhD scholarship) submitted in January 2022.

Commercialisation & Income Generation

CAWCS is engaged with the newly appointed Executive Director of Commercialisation to develop commercialisation and income generation. This commercial activity will focus in two broad areas, building on a substantial track record in collaborative research funding from a broad portfolio of sources. Collaborative funding applications submitted with businesses for research, development and innovation **(CIG1)** will focus on Knowledge Transfer Partnerships (KTPs) in the fields of digital humanities, lexicography, publishing and minority languages and celtic histories and the creative and cultural industries. CAWCS will undertake a detailed market appraisal of further opportunities for consultancy services and research contracts **(CIG2),** in the following areas, and develop bidding experience and capacity to support 30 contracts.

- Digital humanities
- Translation services and lexicography
- Language Policy and Planning
- Bilingual Education
- Place names
- Publishing and minority language

- Creative and cultural industries
- Tourism and Heritage industries

Postgraduate Research

CAWCS has had a small cohort (10) of PhD students registered at UoW since 2011. Its aims in this field include developing a vibrant community of Doctoral Students (Part-Time and Full-Time) across the research areas is a key focus of its strategy and currently CAWCS staff are supervising 14 PhD students (2 UoW, 2 external and 10 UWTSD). We aim to grow this by recruiting at least 3 PhD students annually, and will continue with our joint supervisory arrangements with other Humanities disciplines. CAWCS was a member of the AHRC Celtic Languages and Literatures Doctoral Training Centre (led by the University of Glasgow) and has very strong European networks, in particular bilingual countries and regions. We will seek involvement in Doctoral Training Partnerships (e.g. UKRI, MCSA and KESS3) and International Doctoral Centres **(PGR1)** and develop a post-doctoral research environment to support early career researchers **(PGR3)** and support the development and provision of professional Doctorates **(PGR2)**. Within UWTSD, we will work with Humanities at Lampeter, Education and WISA in particular. We will:

- **Pan-Wales collaboration.** Explore a successor the KESSs programme, developing applications in ICT and Digital Economy
- **Doctoral Training Partnerships**: Submit 2 Marie Skłodowska-Curie Doctoral Training Partnership applications, develop applications to Coleg Cymraeg Cenedlaethol PhD scholarships and actively seek involvement in a UKRI Doctoral Training Partnership and Collaborative Doctoral Awards (CDA)
- **Recruitment**: Recruit at least 18 students on Professional Doctoral or Masters by Research level programs
- **Postdoctoral support.** Host 3 MSC Postdoctoral Fellowships and include doctoral awards or post-doctoral researchers on research project grants
- **Professional Doctorates:** Contribute to the Professional Doctorate in Heritage also continue to support the Prof Doc English Language and Literature
- **Research Environment.** We will increase overall satisfaction of doctoral training **(PGR4)** to 90%. This target will be supported through full participation in the UWTSD Doctoral College and Coleg Cymraeg Cenedlaethol and through training opportunities offered through Coleg Cymraeg Cenedlaethol, CRN, IAMLMR, ENROPE, ASCNA. CAWCS will likewise contribute to UWTSD supervisory capacity in the Welsh language (supervision, training, monitoring, examining) and will work with colleagues across UWTSD to develop a Welsh Language Research Strategy, to further develop postgraduate research capacity in using the Welsh language for conducting and communicating research.

People

CAWCS is implementing PDR across all posts including researchers, and will fully engage in future staff development programmes as INSPIRE rolls out support in relation to the Researcher Development Concordat.

14. Education

Research Themes and Centres

The University is committed to research in education across its constituent disciplines. This activity is multidisciplinary with interdisciplinary aspects drawing on staff within two of the University's three Institutes (Education and Humanities, and Management and Health). This structure supports focused areas of research in Pedagogy and Education Policy, Work Based Learning, Enterprise Education and Health & Physical Literacy. The research centres within this structure are as follows, which are detailed in Appendix 14:

Centre for Research in Education, Curriculum and Pedagogy. Work in CRECP focuses on four education-facing research strands. These strands are defined thematically, include research activity currently underway and direct planning for future research activity:

- **Curriculum and Progression:** research on enhancing understanding about progression in learning, with specific reference to the new national curriculum for Wales, and relevance internationally.
- **Early Years research:** focus on early learning and attachment, and issues of professional learning and policy for the ECEC sector. Engages with practice-facing partners to ensure direct impact on pedagogies adopted across the region.
- **Professional Learning and Pedagogical Enquiry in Education**: A research programme in which professional approaches to pedagogical enquiry in school settings are developed. Ongoing work explores change in initial teacher education (ITE), and the development of metacognition in the primary years.
- **Social Justice and Wellbeing.** Research explores well-being through a social justice lens, promoting equitable and sustainable societies and communities.
- **Canolfan Peniarth**. CRECP also includes Canolfan Peniarth, one of the leading creators and publishers of Welsh and bilingual educational books and resources in Wales.

Centre for Education Policy Review and Analysis. CEPRA was established in 2018 to contribute 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 is 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 policy-making. The Institute is actively engaged in developing international best practice in enterprise, entrepreneurship and entrepreneurial teaching, learning and evaluation. This includes contributions to the Welsh Government's National Curriculum for Wales Areas of Learning Experience (2020) and the European Union's EntreComp Framework (2016).

The Wales Academy for Professional Practice and Applied Research. Applied research in WAPPAR focuses on approaches to pedagogy and curriculum development for work-based learners and practice researchers and approaches to change and development

through coaching and mentoring. Theoretical and ethical aspects of practice-based studies include conceptualising change in work with innovative and responsive methodologies for practitioner-research.

Wales Academy for Health & Physical Literacy. 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 maintain functional movement in old age. The Centre for Heathy Aging, located within the Academy for Health and Physical Literacy, 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 has developed programmes supporting an aging population to maintain functional movement.

REF 2021

Education research was submitted to REF2021 under UoA 23 (Education). The overall rating for world leading and internationally excellent research was 35% with 84% at internationally recognised or better. 75% of the Unit's impact was judged to have very considerable impact:

UOA	Profile	FTE	4*	3*	2*	1*	UC	3*/4*
23	**Overall**	**13.4**	**4**	**31**	**49**	**14**	**2**	**35**
	Outputs	13.4	5.9	20.6	50	20.6	2.9	**26.5**
	Impact	13.4	0	75	25	0	0	**75**
	Environment	13.4	0	0	87.5	12.5	0	**0**

SWOT Analysis

In preparing the submission, the following strengths, weaknesses, opportunities and threats became apparent, as summarised below.

Strengths		Weakness
• The research and knowledge exchange activity in each research centre is practice-focussed, applied in nature, and designed to inform professional practice. Collectively the Centres work with a very wide range of research users, collaborators and audiences to generate research impacts. • Funding totalling £6.8m has been secured for research activity (£1.6m), knowledge exchange, including commercial income from Canolfan Peniarth and CPD (£5.2m) and doctoral training (£300k). • The institutes and their research centres have pursued a successful strategy in developing the postgraduate research environment and have established new profession-facing research programmes and in recruiting research students.	Internal Factors	• While the University made a strong submission in REF, the 18 staff (13.4 FTE) were drawn from the four quite distinct areas of IICED, Yr Athrofa, WAPHL and WAPPAR. While the activity in each is complementary, this structure evidences a weakness in critical mass. • Some key research staff have left the University. Retaining staff, and replacing staff who have left is a priority and should be addressed • The volume of research output is variable within the Centres with approximately 30% only having one available output (since 2014). Developing Early Career Researchers is a priority in this regard. • Most staff have the minimum 10% of annual hours assigned to research in their activity profiles, limiting capacity to develop.
Opportunities		**Threats**
• The research centres are developing local, regional, national and international partnerships that will support collaborative working • There is a good track record in securing funding to underpin the spectrum of KE activities, including collaborative research, contract research and consultancy, commercial activity, CPD and community engagement. • The institutes and their research centres have pursued a successful strategy in developing the postgraduate research environment and have established new profession-facing research programmes. • There is considerable opportunity for building on REF2021, specifically in relation to creating greater internal cross-collaboration for research funding bids, and future innovation. • The re-accreditation of ITE requires demonstrable capacity and engagement in practice-facing research that informs the ITE programme; there is significant opportunity to realise this, post REF2021, and become leaders in this field.	External Factors	• Since 2014, the University has lost established researchers, many of whom have developed their research and innovation skills with our support and now work in other Welsh Universities. Replacement appointments have not been to the same level. • The University cannot sustain the levels of activity presented in REF 2021 UoA 23 with current levels of staffing and research expertise. • Since much of the University's reputation within the broad education sector relies upon our research and KE expertise there is a reputational threat if we cannot deliver appropriate expertise in our PG PL offer, or for research and KE projects. • The required capacity and engagement in practice-facing research to inform the ITE programme, and ITE accreditation, is currently at a very low level. • There is a pressing need to develop broad-based capacity and research leadership in order to exploit interdisciplinary collaboration across the University on research funding bids and future innovation.

Research and Innovation Priorities for 2022-2027

The following research and innovation priorities will form the basis of Education research for the lifetime of this strategy. Detailed plans, success measures and targets are provided in Appendix 14. These will be monitored and updated on an annual basis.

Research Excellence

The education research centres will build upon it's developing areas research excellence to establish an expended portfolio of grant funded projects. Our focus will be to align our research activity to funder-defined research challenges and ensure that the overall portfolio is aligned to areas that support the Welsh education system. We will:

- Develop challenge-based research in defined areas, such as leadership in education**,** curriculum, progression and pedagogy (most notably the CAMAU 2 project); the health and wellbeing of learners (for example green prescribing and adolescent mental health) and research based on increasing productivity through entrepreneurship education and professional doctorates. We will publish at least 40 outputs of REF standing (**RE2).**
- Develop curiosity-driven discovery research in clearly defined areas, publishing at least 75 outputs of REF standing **(RE1).**
- Target and prioritise challenge-led funding, developing at least 15 applications to challenge based funding schemes or calls **(RE3).**
- Increase applications for all research and knowledge exchange projects. Research staff with SRR will be supported to submit at least 15 grant applications **(RE4).**
- Increase funding success rate to 65%. All staff with SRR will be incentivised to actively engage in development opportunities supporting project development and grant applications **(RE5).**
- Develop the Open Access research environment, ensuring that REF or funder defined open access compliance rates are at or above 80% **(RE6).**

Civic Mission

The educational researcher centres will promote and improve the economic, social, environmental and cultural wellbeing of Wales **(CM1)** by undertaking enquiry-based pedagogical development in school-facing settings, and facilitate the professional development for teachers in physical literacy and outdoor learning as an educational and therapeutic intervention. IICED will contribute to enterprise support **(CM2),** through research and knowledge exchange projects that supports the development of social enterprise, business skills and employability or supports social innovation and entrepreneurship opportunities for undergraduates and educational leaders. The aim over the coming 6 years is therefore develop the following areas of engagement:

- **CAMAU 2.** Develop the existing area of professional development in the areas of curriculum, progression and pedagogy.
- **National Professional Enquiry Project.** Develop the NPEP (and NPEP 16+) and APLP collaborative knowledge exchange work, extending the skill-base and confidence of school-based staff to explore and refine pedagogic practice using available research knowledge and enquiry methods.

- **COVID 19.** Develop responses to the impact of COVID 19, through collaboration with HEIs and research gap studies as part of the long-medium term WG COVID 19 recovery in education programme.
- **Welsh Government's Race Equality Action Plan**. Develop an initiative responding to issues around diversity and representation in education in response to the final report of the Black, Asian and Minority Ethnic Communities, Contributions and Cynefin in the New Curriculum Working Group.
- **Parental engagement to support physical literacy**. Further develop parental engagement research and professional development focused on parental engagement to support physical literacy in families through: **i)** *Footie Families*, a family engagement programme for the community in partnership with FAW-Trust, **ii)** *MiniMovers*, a parental engagement programme combining motor development, creativity, and technology, and **iii)** professional development linked to nutrition and motor development to support professionals to address overweight and obesity in children.
- **Entrepreneurship Education**. Based on prior work for Welsh Government and the new curriculum, and in partnership with the National Academy for Educational Leadership, Cymbrogi Futures and others, develop school leadership abilities related to innovation and skills essential to the four purposes of the Curriculum for Wales.
- **Enterprise Support.** In partnership with Ship Shape, build our partnership to support our local start up community.

Innovation

All research in the education research centres is undertaken with the education practice community in mind; research therefore has the potential for immediate social impact in that it changes pedagogic practice in learning settings, and contributes critically to policy responses within these settings and the broader education system **(IN1)**. The following areas of innovation are being developed:

- **CAMAU 2 project**. Research in curriculum, progression and pedagogy exploring, with colleagues from University of Glasgow and APLP school-based staff, the development of progression frameworks within the Curriculum for Wales (CfW) statutory curriculum initiative across Wales.
- **Harmonious Entrepreneurship**. Building on prior work and the development of the Harmonious Entrepreneurship Society, develop research and insights and innovative practices that link the needs of sustainability to the abilities of innovative enterprising mindsets.
- **Educational Leadership**. Further develop educational leadership support in partnership with the National Academy for Educational Leadership.
- **Outdoor learning and healthy children.** Curriculum development in early years' physical literacy including outdoor learning, adolescent mental health and school grounds, parental engagement to support children's physical development, therapeutic landscapes, mass participation sporting events and green prescribing.

Collaboration

CRECP members build research activity in partnership with schools from the University's ITE partnership the Athrofa Professional Learning Partnership (APLP) consisting of eight lead network schools and over a hundred partnership schools. IICED has previously been described as world leaders in Entrepreneurial Learning by the EU Joint Research Centre, and in 2021 was promoted as international gold standard by the International Council for Small Business in their education manifesto. This has led to requests for collaboration from international partners such as the USA based USASBE business and enterprise research community, the EU's Intrinsic Project on sustainable education and numerous international HE providers. Research and knowledge exchange activity within WAHPL focuses on relevant education practice communities as well as the broader population. Research collaborations exist with Third Sector organisations as well as researcher's in other HEI's within Wales and internationally, including North America. Building on this collaborative activity **(COL1, COL2),** thought-out the lifetime of this strategy we will ensure that:

- **Academic Collaboration**. At least three-quarters of humanities staff (with SRR) will be supported to have active research networks in the UK and internationally that involve meaningful academic collaborations, and that they actively participate in opportunities through the Wales Innovation Network, the Learned Society of Wales, and other national networks.
- **Education**: We will strengthen existing collaborations, and develop new partnerships in areas such as children's rights in education settings with members of the CREYN, Welsh Government's COVID-19 recovery in education projects and the Collaborative Research Network (CRN) initiative.
- **Entrepreneurship**: Continue to work with the Welsh Government, UK Intellectual Property Office, Universities UK, the All Party Parliamentary Group for Entrepreneurship, the Social Innovation and Enterprise Forum, the Small Firms Enterprise Development Initiative, the Institute for Small Business and Enterprise, the Institute of Enterprise and Entrepreneurs, Enterprise Educators UK and AdvanceHE and the Quality Assurance Agency, among others.
- **Physical Literacy**: Develop strong partnerships with organisations to further research into adolescent mental health, outdoor learning and school ground developments, and support a community hub development focused on outdoor engagement with nature for physical and mental health benefits.

High-level Skills, CPD & Lifelong Learning

The centres have pursued a successful strategy in developing the postgraduate research environment and have established new profession-facing research and CPD programmes. Ongoing priorities **(HS1)** are to develop new programmes for those seeking higher-level technical or professional skills development. We will:

- Consolidate and develop further the professional doctorate (EdD) to include a broader reach, including an international distance offer.
- Develop a MRes Creative Learning related to the new CfW purposes.
- Develop PGDip in digital learning offer to include cross-discipline delivery.

- Continue to work with Welsh Centre for Learning Design (WG funded) in order to maximise any opportunities for Professional Learning engagement and offer.
- In partnership with Ship Shape and other funders, develop opportunity-based learning provision that helps to develop intellectual property and develop a research pathway with the Harmonious Entrepreneurship Society that integrates lessons learned in value creation within a sustainable and equitable society.
- Expand current professional development for Early Years Teachers in SKIP-Cymru Training.

Regional Regeneration

The research centres will continue to work on regeneration projects, developing a portfolio of funded programmes with regeneration outcomes. These will focus on the social, educational and heath based aspects of regeneration and economic development, such as interventions to improve health and wellbeing, arts based community education projects and the provision of targeted education, skills development and training in specific areas of need. Building on past successes in accessing arts (ACW), Welsh Government, charitable and European regeneration funds (e.g. ERDF, ESF, EAFRD) we will work with our partners on regeneration projects through the city and regional growth deals (**RR1)**, the UK Shared Prosperity and Levelling-Up Funds, as well as successor schemes to the Rural Development Programme **(RR2)**. Specific actions will include:

- **Educational Equity.** Maintain and develop engagement with the CRN equity / wellbeing, focussed upon removing barriers to children's attainment for those who experience disadvantage as a result of equity and wellbeing issues.
- **Rural Enterprise.** Contributing research informed activities to deliver the food and rural enterprise academy for the development of Canolfan Tir Glas.
- **Health and Wellbeing.** Improve children's physical literacy and motor development for an active adult life and improve quality of life experiences for older populations through functional fitness.
- **Levelling Up.** Develop projects related to defined areas within sphere of education and health and well-being as details of the UK Shared Prosperity and Levelling-Up Funds are announced.

Commercialisation & Income Generation

Education researchers with work with the Executive Director of Commercialisation to develop new income streams for the University **(CIG2, CIG3)**. This will build up the track record of contract research and the provision of specialist services with Welsh Government and public sector bodies. Current areas, and those in development include:

- Continue to attract Welsh Government and regional consortia money to provide research and knowledge exchange services in the field of education practice and policy in targeted areas**.**

- Building on existing consultancy with bodies, including the Network for Advancing and Evaluating the Societal Impact of Science, research, design and deliver activities for the commercialisation of University research.

- Develop consultancy offer on Intellectual Property Education within Higher Education.
- Complete business planning and investment plans for Mini Movers spin-out to be launched in 2022.
- Further develop Skip Cymru services.

Postgraduate Research

The research centres have pursued a successful strategy in developing the postgraduate research environment and have established new profession-facing research programmes and in recruiting research students. Priorities for the next period are to Seek involvement in Doctoral Training Partnerships (e.g. UKRI, MCSA and KESS3) and International Doctoral Centres **(PGR1)**, develop and/or consolidate new professional PGR programmes **(PGR2)**; to develop the Doctoral research environment by hosting post-doctoral fellowships **(PGR3)** and improve the quality of the doctoral training environment **(PGR4**). Specific actions are:

- Submit at least two applications to the Marie Skłodowska-Curie Actions doctoral partnerships programme and host two post-doctoral fellowships.
- Continue to provide the National MA(Education), a partnership of eight HEIs in Wales and explore opportunities for education-facing PGR collaborative provision, including the MRes creative learning.
- Consolidate the professional doctorate (EdD) to include a broader reach, including an international distance offer.
- Establish pool of external supervisors.
- Develop professional and opportunity-based career progression opportunities in enterprise development.
- Develop a professional doctorate in Physical Literacy.

People

The centres will work with INSPIRE, and Human Resources to implement the actions of the Researcher Development Concordat and maximise opportunities to recognise and reward the achievements of staff and students who perform high quality research and knowledge exchange activities **(PE1)**. This will be achieved by:

- Mentoring for ECRs within staff, including publication planning and post-doc research planning, this drawing on expertise from thorough the University.
- Mentoring to move from 2* outputs to 3/4* outputs.
- Engage fully with the doctoral college to ensure enhancement of the research environment.
- Ensure all PGR supervisors attend appropriate training and development
- Recruit staff to lead in the area of knowledge exchange to develop experience and capacity.
- Develop regular sharing events internal/APLP as well as twice-yearly research days.

15. Psychology

Research Themes and Centres

The Psychology unit has operated as a distinct research discipline with expertise in experimental and applied psychology since 2015. Since its inception the unit has focused around a clear five-year research strategy (2015-20) to develop and support early career researchers and collaborative research. The research activity, grant capture, research facilities and output have increased significantly over this period. This uplift in research activity has built on successful projects and has allowed the unit to establish and pursue a clear strategic programme of work, with its first submission to the REF in 2021. Now that the unit has firmly consolidated its basis for growth, its research strategy aims to increase funding income and outputs through building programmes of research with a clear framework for developing measurable routes to impact. The unit has continued to build upon the areas of research activity aligned to the following four research groups, which are detailed in Appendix 15:

- **Psychological Health and Wellbeing.** Research activity in this group focuses on understanding the psychosocial and emotional dimensions and predictors of both physical health and mental wellbeing, with a focus on psychosocial oncology, recovery from addiction and eating behaviour.
- **Social, Group, and Political Psychology**. Research is focused on the areas of social and political psychology and has explored the significance of international terror attacks on prejudice levels of the UK population, prejudice levels and political and voting behaviours, particularly related to the Brexit vote and issues relating to hate crime, refugees and asylum-seekers.
- **The Psychology of Teaching and Learning.** This research is interdisciplinary in basis, covering psychosocial aspect of learning, additional learning needs in the classroom such as teacher knowledge and attitudes towards attention deficit hyperactivity disorder, and student coping strategies during the COVID-19 pandemic.
- **Applied Cognition.** This developing research group has emerged from increased cognitive research within the unit and increased collaboration with outside agencies, with a clear focus on the application of knowledge of cognitive processes to real-world issues, such as technological capability and military training.

REF 2021

Research in Psychology was submitted to REF2021 under UoA04 (Psychology, Psychiatry and Neuroscience), with the following quality profile.

UOA	Profile	FTE	4*	3*	2*	1*	UC	3*/4*
04	**Overall**	**4.9**	**0**	**5**	**34**	**56**	**5**	**5**
	Outputs	4.9	0	8.3	50	33.4	8.3	**8.3**
	Impact	4.9	0	0	0	100	0	**0**
	Environment	4.9	0	0	25	75	0	**0**

SWOT Analysis

In preparing the submission, the following strengths, weaknesses, opportunities and threats became apparent, as summarised below

Strengths		Weakness
• The application of research to real-world issues underpins the unit's research aims, be these grant applications, research outputs, or wider engagement with the community and society, supported through the unit's Psychological Evaluation and Research Consultancy Hub (PERCH) • This group has a track record of collaborative research and knowledge exchange undertaken with local NHS partners, Tenovus Cancer Care, Welsh Government, Race Council Cymru, charities and public sector organisations. • Knowledge Exchange covers contract and consultancy work, collaborative research, active citizenship and CPD.	**Internal Factors**	• Funding has been limited to smaller-scale project grants which tend to limit the resultant publications to 2* quality (e.g. useful incremental knowledge). • Grant funding since 2014 has been limited to £152k across six grants. Eight unsuccessful funding applications were developed by two members of the Unit, totalling £719k. The success rate has therefore been 43% funded (17 % by value) and 57% not funded (83% by value). Increasing the proportion of larger grants funded should therefore be a priority. • Five members of staff (FTE 4.9) have a significant responsibility for research, from a total staff compliment of seventeen.
Opportunities		**Threats**
• The research groups have been consistently responsive to research opportunities that emerge through national and international priorities. Such challenge led funding opportunities (e.g. ESRC, Horizon Europe) provide considerable scope for development. • The Unit's track record of supporting interdisciplinary work likewise provides good opportunity for participating in larger collaborative projects where a psychological perspective is needed, for example in studies of technology development and adoption, design, educational development and medical research. • The unit has a good track record across key areas of knowledge exchange, with identified opportunities in the key areas of collaborative research, contract and consultancy research, collaborative research, active citizenship and CPD. The Psychological Evaluation and Research Consultancy Hub (PERCH) is an established vehicle to grow this area of work.	**External Factors**	• REF2014 results shows that the discipline is characterised by larger units, the average being 30FTE. Approximately half of the universities submitted a staff FTE in the 20-60 range and the remaining 50% averaging 11 FTE. Five submissions were on the 3-6 range. • The Units REF2021 submission required just 12 outputs, as such the REF benchmarking will be limited. • The University's modelling is certain that the Unit will fall below HEFCW's current sustainability threshold for attracting QR funding. • Average funding across all 82 submissions was £16m per submission, this is skewed by the high proportion of large research infrastructures, and for smaller submissions (approx. 10 FTE) funding was in the general range of £200k-£500K. This is clearly a well-resourced and very competitive funding environment.

Research and Innovation Priorities for 2022-2027

The following research and innovation priorities will form the basis of psychology research for the lifetime of this strategy. Detailed plans, success measures and targets are provided in Appendix 15. These will be monitored and updated on an annual basis.

Research Excellence

Whilst the Psychology unit entered the last REF exercise with 5FTE staff submitting 12 outputs for assessment, the majority of these outputs were produced in the final 24 months of the REF cycle and came about as the unit started to achieve a critical mass in research production. We have therefore set out a plan of action for the next strategic plan cycle that is sustainable and realistic, focusing upon the volume and quality of research produced. We will:

- Develop research capacity achieving 11 members of staff as having SRR by the end of this cycle (up from five in the previous cycle), taking our unit to 66% with SRR **(PE1)**.
- Publish 36 outputs across the cycle (average of 2-4 per person) with the quality of the outputs from those submitting to the previous REF expected to increase (from an average of 2* to 3*. These will incorporate both individual curiosity-driven research and defined projects in areas linked to the four sub-groups within the unit **(RE1** and **RE2)**.
- Bid for and secure funding from open challenge-led funding schemes. More experienced researchers will be supported in working to pursue larger grants whilst less experienced researchers will be supported to pursue seed-corn and smaller grants **(RE3** and **RE4).** Detailed research plans will be established for this purpose with an average of 8 applications submitted per year.
- All staff with SRR will be expected to engage in development opportunities supporting project development and grant applications to increase success rates to 65% **(RE5).**
- Ensure that staff are compliant with open access requirements to ensure REF compliance and transparency of research outputs **(RE6).**

Civic Mission

The Psychology unit has always demonstrated a strong commitment to its civic responsibilities and will continue to engage in initiatives that promote the social, environmental and cultural wellbeing of Wales and beyond. Each of the Unit's four sub-groups map directly onto the Wellbeing of Future Generations Act through addressing the promotion of wellbeing, sustainability and cultural awareness. Two key strategic developments linked to the civic mission include growing work around prejudice and discrimination, and mental health and wellbeing **(CM1)**.

- **Education, asylum seekers and refugees.** Continued links with the Black History Month initiative and developing links with the African Community Centre in Swansea brings with it significant potential for a national contribution to supporting the education of asylum seekers and refugees, with two PhD projects due to start in

February 2021 exploring issues around access to education for asylum seekers and refugees and cultural barriers to accessing psychological therapy in Muslim populations.

- **Centre for Children and Young People's Mental Health.** The Unit's launch of the Centre for Children and Young People's Mental Health in January 2022 is in a direct response to the mental health crisis in children and young people and requests for increased training among education and healthcare professionals across Wales.
- **Dementia Friendly Swansea**. The Unit continues to support the work of Dementia Friendly Swansea and offers dementia awareness training to all staff and students on an annual basis, delivered by the Unit's Dementia Champion.
- **Supporting Local Health Boards**. The Unit continues to support the work of the local health boards in a variety of responsive ways, including contributing to service evaluation projects and involvement in one of the local NHS Research Ethics Committees, demonstrating its commitment to ethical research that supports and promotes health and wellbeing within the Welsh population.

Innovation

The Psychology unit's strategic plan will continue to support the two areas of research impact identified in the last REF submission **(IN1)** and will look to further strengthen and expand upon these.

- **Psycho-oncology service delivery**. The Psycho-oncology research activity will continue to seek further research funding to enable us to create and evaluate interventions and models of service delivery that meet the needs of the Welsh and UK cancer population, and we will be exploring spin off opportunities from our recent KESS-funded PhD studentship with Tenovus Cancer Care and the associated collaboration with Welsh technology company Vindico Ltd.
- **Improving user experience of prosthetic devices**. The Unit's collaboration with ATIC and Welsh manufacturing company LIMB-art is exploring the impact of bespoke leg covers for prosthetic limb users (amputees) using a range of innovative evaluation methods, with plans already in place to seek further funding for both research students and larger grants to enable us to carry this forward. The innovation of this project has been recognised by Welsh TV company S4C with a request to discuss the project in one of their programmes.
- **Tackling Implicit Prejudice**. The Project ImpEx research activity will continue to develop, through basic and applied research activity, training and public engagement activities designed to address the significant unmet needs of cultural groups within Welsh and wider society. We will work with community organisations to explore the barriers and facilitators to accessing education for refugees and asylum seekers in Wales and examine and address attitudes to cultural differences and social class within school environments.

Collaboration

We will develop our collaborative networks, with 9 staff being actively involved in developing partnership opportunities in with academics in Wales **(CO2)** and other stakeholders **(CO1)**.

These will be focused on the Psychological Health and Wellbeing Group and the Social, Group and Political Psychology group **(COL1).** These collaborations will include:

- **NHS.** Develop our current discussions with both external partners (NHS) and colleagues within the University aligned to the University's health offer through promoting the unit's Psychological Evaluation and Research Consultancy Hub (PERCH).
- **Race Council Cymru**. Develop collaborative projects relating to prejudice and discrimination in conjunction with third-sector organisations such as Race Council Cymru.
- **WIN**. Active involvement with the Wales Innovation Network.
- **The National Strategy for Educational Research and Enquiry**. Further development of the Psychology unit's input into the NSERE education research programme.
- **Interdisciplinary research**. We will develop interdisciplinary projects within the University by collaborating with ATiC, CiC, CRECP and WAHPL.

High-level Skills, CPD & Lifelong Learning

Linked to the Psychology unit's work in psychological health and wellbeing, we will continue to consolidate our sector-leading expertise in counselling skills and practice-based qualifications and develop micro-credentials **(HS1)**. We will:

- **Psychotherapeutic Practice**. Continue to resource and market our Graduate Certificate in Counselling Skills and MA Psychotherapeutic Practice programmes, with appropriate accreditation sought for the MA in line with sector developments.
- **Skills Training.** The skills training offered within the Unit linked to counselling and embedded helping/listening skills are attractive to a range of occupations including teaching, police, and health and social care, and we investigate the potential of developing micro-credentials within this area.
- **Micro-credentials**. In order to develop additional knowledge exchange activity and to develop further income streams we will look to deliver short micro-credential courses based upon the expertise related to our wider research centres and projects including mental health in children and young people, ecotherapy and unconscious bias.

Regional Regeneration

Our regeneration activities will continue to be aligned to health and wellbeing, education, and cultural outcomes **(RR1).** Funding opportunities will be explored through the forthcoming levelling-up funds **(RR2)** and other sources as appropriate.

- **Young People's Mental Health**. The development of the Centre for Children and Young People's Mental Health will offer responsive training and development opportunities linked to unmet needs within the region across a range of sectors.
- **Increasing productivity**. Our continued work with Education will increase levels of mental health and wellbeing literacy within the education sector and enable young

people and education professionals to be better supported at an early stage, leading to better educational attainment and outcomes and a more resilient workforce.

- **Equity and diversity**. Ongoing work with Race Council Cymru and new partnerships with the African Community Centre and other third sector organisations working with Asylum Seekers and Refugees will address issues of equity and diversity and promote a more culturally literate society.

Commercialisation & Income Generation

The Psychology unit will seek to further develop its commercialisation and contract capture activity through the increased marketing of PERCH and consolidating existing partnerships. Under the umbrella of PERCH, we will be in a stronger position to seek continued funding from collaborations with ATIC via Accelerate UK, as well as seek additional consultancy contracts**.**

- **Contract research**. We have successfully bid for and delivered Welsh Government funded contracts over the last REF period and we now need to build on these to bring in more significant income from a range of public, private and third sector bodies (**CIG1, CIG2).**
- **IP development**. We will seek to explore further commercialisation opportunities from our KESS-funded PhD studentship toolkit and database development and identify opportunities for commercialisation of future interventions developed within the Unit **(CIG3)**.
- **Effective Collaboration**. The Unit will also support each researcher linked to groups working with outside agencies (RCC, African Centre, Hywel Dda Health Board) to publish at least one academic paper for REF submission with a non-academic partner (**CIG4).**

Postgraduate Research

The Psychology unit has, in the past, attracted a small cohort of high-quality PhD students working on topics closely aligned with research project areas of those qualified as Directors of Study. There are currently six members of staff capable of PhD supervision, three as Directors of Study. The intentions of the unit over the next period are to:

- Increase the supervisory capacity of the unit by 50%, taking us to a minimum of 9 members of staff with supervisory capacity and five Directors of Study.
- Increase the number of PhD students supervised within the unit by submitting grant applications linked to Doctoral Training Partnerships **(PGR1).**
- Developing MRes programmes to increase the research capacity and provide a potential pipeline of doctoral students in the areas of Prejudice and Discrimination and Health and Wellbeing **(PGR2).**
- Seeking funding for postdoctoral research fellows on research grants and UKRI Doctoral Training Partnerships **(PGR3).**
- Maintain our PRES results, which have consistently been at the baseline figure of 90% **(PGR4).**

People

Whilst we must await the outcome of the Researcher Development Concordat **(PE1)** to plan effectively for the allocation of staff in accordance with their activity profiles, it is the intention of the unit to increase the number of staff members eligible for future REF submission to Therefore, we will:

- Develop individualised Action Plans with regard to the Research Development Concordat for each research-active member of staff and in cooperation with unit management and HR.
- Increase the number of staff who meet the eligibility criteria to the next REF submission from 30% (5) to 66% (11) in accordance with the Researcher Development Concordat.

16. Contemporary Arts Practice

Research Themes and Centres

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:

- Collaborative research with healthcare professions and communities to promote health and wellbeing, with particular reference to sexual identity and sexual health;
- Socio-geographic themes of identity, community and belonging, these ranging from local site responsive work to global geo-political issues;
- 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.

REF2021

The Unit's research was submitted to REF2021 under UoA32 (Art and Design: Theory and Practice). The overall rating for world leading and internationally excellent research was 56% with 88% at internationally recognised or better. 85% of the research environment was judged to support internationally excellent research while 75% of the Unit's impact was judged to have outstanding or very considerable impact:

UOA	Profile	FTE	4*	3*	2*	1*	UC	3*/4*
32	**Overall**	**18.2**	**9**	**47**	**32**	**9**	**3**	**56**
	Outputs	18.2	4.3	37	39.1	15.3	4.3	**41.3**
	Impact	18.2	25	50	25	0	0	**75**
	Environment	18.2	0	85	15	0	0	**85**

SWOT Analysis

In preparing the UoA32 submission, the following strengths, weaknesses, opportunities, and threats became apparent, as summarised in Table.

Strengths		Weakness
• Staff in the Contemporary Art Practice area (CAP) are involved with applied research and knowledge exchange programmes, designed to deliver impact. Centres work collaboratively with academic, public and private partners to deliver health, cultural and societal benefits. • The focus on health and wellbeing WISA has encouraged collaborations between artists and health practitioners or mental health specialists. • The £15.5m of funding secured for research and innovation activity spans all areas of KE, including basic and collaborative research, CPD, commercial income and civic mission activities. • Research in contemporary arts practice has a strong tradition in public engagement and creative explorations of global challenges, while also contributing to place-making initiatives. • The Metadesign Research Centre (MDRC) has been established to drive engagement in the Wellbeing of Future Generations (Wales) Act.	**Internal Factors**	• A number of the staff in CAP are on fractional posts. Or have a significant teaching and administration load. Without remission the staff workload is seen as being too intense to carry out larger scale research projects. • The funding landscape within Arts is being cut nationally both in terms of funded opportunities and monies offered. • The expectation to publish/exhibit the results of this research and innovation activity is not embedded within a project-based research environment, • In terms of the volume of output, the UoA32 REF2021 submission drew quite heavily on the outputs of 5 former members of staff, two of whom moved to new positions during 2020, and a third late in 2019. Succession planning is required in this regard.
Opportunities		**Threats**
• Staff in the Contemporary Art Practice area (CAP) have a number of possible opportunities for working with Partner colleges throughout South Wales • Considerable strength can be gained by establishing collaborative arrangements and partnerships with Arts research/funding organisations. • Within the wider confines of the Wales Institute of Science and Art. the Contemporary Art Practice area are a strategy of developing the postgraduate research environment. A key priority will be to develop funded collaborative projects especially within the third sector to consider the impact of the pandemic on Wellbeing and Mental Health.	**External Factors**	• The UK's withdrawal from the EU means that the sources of funding will not be available for future endeavours. • Critical mass within CPA is limited to 6 or 7 researchers who have a sustained research output.

Research and Innovation Priorities for 2022-2027

The following research and innovation priorities will form the basis of art and design research for the lifetime of this strategy. Detailed plans, success measures and targets are provided in Appendix 11. These will be monitored on an annual basis.

Research Excellence

The main priority for the coming 6 years is to further consolidate the interdisciplinary research within the field of contemporary arts practice and to maintain the production of the already recognised world-class research outputs. The target **(RE1)** is the publication of a total of 24 publications of international excellent or world-leading monographs and edited volumes, as well as peer-reviewed and open access journal articles and practice based outputs. Working with colleagues across the University the research active staff within the Arts area will identify this challenge led priorities of research funders **(RE2).** The Aim and the objective will be to publish twenty outputs across the identified priorities. We will submit at least twelve funding applications; six to investigator defined themes (**RE4)** and six to Challenge based calls **(RE3)**.

Civic Mission, Impact and Innovation

The Creative Industries Research and Innovation Centre (CIRIC) is a key component of CAPs Civic Mission activity which has delivered a stream of very successful knowledge transfer projects which drive innovation and produce cultural and economic impact **(IN1)**. Work will continue to support projects that supports the development of social enterprise, business skills and employability, and social innovation and entrepreneurship opportunities for undergraduates **(CM2)** as well as issues of sustainability and the wellbeing of future generations **(CM1)** through projects in the areas of

- **Arts and Entrepreneurship.** The Arts and Humanities Entrepreneurship Hub is an alliance of fourteen partners from seven European countries who work together to jointly research, design, test and disseminate entrepreneurial training for arts and humanities staff and students. This ongoing project and its successors will lead to the creation of an open-access website to complement the creation of seven entrepreneurship hubs to provide long-term support for art and design graduates. The Craft Hub and DeuS projects are boosting creativity and enterprise amongst art and design practitioners by highlighting the transformative power of design and craft.
- **Metadesign.** Established on 2019, the Metadesign Research Centre (MDRC) is a vehicle to support and develop interdisciplinary research across the University. The particular focus for the MDRC Wales is to work with the Wellbeing of Future Generations (Wales) Act (Welsh Government, 2015) and to engage with the environmental legacy and knowledge situated within the Welsh language. MDRC will be interdisciplinary and connect writing in creative practice, science and art using design as the bridge to enable collaborations, connections, novel tools, processes and outcomes.
- **Arts, Health and wellbeing.** Key projects promoting health and wellbeing will continue with the Dreams ID project in collaboration with Swansea University Sleep Lab and work on sexual identity through collaborations between artists and health practitioners or mental health specialists.
- **Regional Regeneration**. Socio-geographic themes of identity, community and belonging will continue thorough site responsive work in communities in Wales, the UK and internationally.

Collaboration

Researchers in Contemporary Arts Practice have built strong partnerships with researchers, the public and third sectors, in Wales, across the UK and internationally **(COL1, COL2).** This activity sustains research excellence, and drives effective knowledge exchange to ensure our research delivers substantial impacts.

- **Academic Collaboration**. At least three-quarters of arts staff (with SRR) will be supported to have active research networks in the UK and internationally that involve meaningful academic collaborations, and that they actively participate in opportunities through the Wales Innovation Network, the Learned Society of Wales, and other national networks.
- **Global Wales.** We will participate in the Welsh Government's Taith Programme to support researcher mobility and grown our global partnerships.

High-level Skills, CPD & Lifelong Learning

Swansea College of Art has a history of innovative practice ranging from foundation stage entry and widening access, collaborative PhDs with industry through the KESS programme and successful MA and MRes programmes. We will continue with the development of the DProf in Art and Design has seen very early success in forming articulations with Chinese Collaborators; Guangzhou Academy of Fine Art (GAFA) and Sichuan Academy of Fine Art (SAFA).

Regional Regeneration

The CAP area have always worked closely with both the county and City of Swansea in the various projects of regeneration. This work will continue as part of our commitment to the transformation of Swansea as a 'Digital City' part-funded by the Swansea Bay City Deal. We will continue to work across the broad spectrum of regeneration activities including:

- Community arts and education
- Housing and environment
- Health and social care
- LGBQ+ support
- Post-Covid recovery

Commercialisation & Income Generation

Swansea College of Art will engage with INSPIRE to develop commercialisation and income generation. This commercial activity will focus in two broad areas, building on a substantial track record in collaborative research funding from a broad portfolio of sources. Collaborative funding applications submitted with businesses for research, development and innovation **(CIG1)** will focus on Knowledge Transfer Partnerships (KTPs) in the fields of fine art, the creative industries, craft sectors, design and enterprise. Swansea College of Art will undertake a detailed market appraisal of further opportunities for consultancy services and research contracts **(CIG2)**.

Postgraduate Research

Swansea Collage of Art has a developing cohort of PhD students, and has had success in securing collaborative studentships through the pan Wales KESS programme. We will seek

involvement in Doctoral Training Partnerships (e.g. UKRI, MCSA and KESS3) and International Doctoral Centres **(PGR1)** and develop a post-doctoral research environment to support early career researchers **(PGR3)** and support the development and provision of professional Doctorates **(PGR2)**.

People

Swansea College of Art is implementing PDR across all posts including researchers, and will fully engage in future staff development programmes as INSPIRE rolls out support in relation to the Researcher Development Concordat **(PE1)**.

17. Design for Life-Science, Health and Wellbeing

Research Themes and Centres

Design based research in the Wales Institute of Science and Art has an applied focus and is principally based on the needs of the life-science and health sector, including NHS, health-based charities, industry, private sector service providers and veterinary sciences. This work is organised in two research centres. The Assistive Technologies Innovation Centre (ATiC), established in 2015, collaborates with the private sector, NHS trusts, research charities, and academic partners in the development of innovative products, services and systems in the health and wellbeing sector. The Cerebra Innovation Centre (CIC), established in 2004, is a collaborative endeavour between national charity Cerebra and UWTSD which conducts applied research to design and manufacture bespoke equipment for children with neurodevelopmental conditions where there is a shortfall in market-available products.

Assistive Technologies Innovation Centre (ATiC)

The Assistive Technologies Innovation Centre – or ATiC – is 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 £1.1 million cutting-edge user experience (UX) and usability engineering (UE) research laboratory is based at the University of Wales Trinity Saint David's Swansea Innovation Quarter. Powered by a diverse multi-disciplinary team of artists, designers, architects, scientists & engineers, ATiC's focus is 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
-

This diverse capability enables ATiC to analyse user experiences and performance during interaction with physical and digital healthcare products, services, systems, and spaces. We then use these insights to help our partners develop and evaluate innovative solutions for health and wellbeing.

Cerebra Innovation Centre (CIC)

The Cerebra Innovation Centre (CIC), established in 2004, is a collaborative endeavour between national charity Cerebra and UWTSD which conducts applied research to design and manufacture bespoke equipment for children with neurodevelopmental conditions where there is a shortfall in market-available products. The Centre responds to requests from families to investigate and develop interventions to support independent living and to improve life-quality. The main focus here is on increasing social inclusion by utilising intelligent user-centred design. The products, once designed and manufactured, are given free to families at their point of need. CIC also works with partner companies to commercialize products, for which the University receives royalty payments.

REF 2021

The Unit's research was submitted to REF2021 under UoA32 (Art and Design: Theory and Practice). The overall rating for world leading and internationally excellent research was 56% with 88% at internationally recognised or better. 85% of the research environment was judged to support internationally excellent research while 75% of the Unit's impact was judged to have outstanding or very considerable impact:

UOA	Profile	FTE	4*	3*	2*	1*	UC	3*/4*
32	**Overall**	**18.2**	**9**	**47**	**32**	**9**	**3**	**56**
	Outputs	18.2	4.3	37	39.1	15.3	4.3	**41.3**
	Impact	18.2	25	50	25	0	0	**75**
	Environment	18.2	0	85	15	0	0	**85**

SWOT Analysis

In preparing the submission, the following strengths, weaknesses, opportunities and threats have been identified, as summarised in the table below.

Strengths		Weakness
• ATiC provides a £1.1 million multi-modal research facility that can support research activity across several research and innovation priorities – this provides a significant strength for internal and external research and KE collaborations. • Staff currently engage with a number of regional health boards in South Wales, notably Hywel Dda, Cwm Taf and Cardiff & Vale as well as numerous medical and assistive technologies businesses. • Cerebra Innovation Centre's activities and research output. Head and the CIC team have worked with hundreds of children and their families since 2014 to either produce new assistive devices, or modify others	Internal Factors	• 7 ATiC staff, including two of the management team, contributed to the University's submission to UoA32 in REF2021. However, 5 staff with SSR are on fixed term research only contracts directly funded by ERDF which are due to end Decxember 2022. • While the number of applied research projects and potential for publication is high, the volume of REF level outputs is low due to time commitments to current ERDF funded project, limiting capacity to develop outputs and progress indivdual researcher ambitions.
Opportunities		**Threats**
• ATiC is continuing to establish local, regional, national and international partnerships that will support future collaborative working across NHS, Industry and Academia. • ATiC has established an excellent track record in securing funding through its current partnerships (Accelerate £4.2 million / Innovate UK £650k) and in effective project delivery (Total Accelerate project value £2.4 million) which will serve to underpin future grant funded and commercial RD&I activities. • There is considerable opportunity to build on REF2021, specifically in relation to internal inter-disciplinary collaboration with partner research centres in UWTSD. • There is considerable opportunity to develop commercial potential through contract research with existing industry partners. • ATiC's partnership with HDUHB's TriTech Institute extends its RD&I reach across NHS Wales and Med & Bio Tech Industries worldwide	External Factors	• Over reliance on a single funding income stream to retain ATiC staff team and build research capacity. • EU funding will not be available for the successor programme to Accelerate, alternative sources of funding (UKRI, Horizon Europe etc.) are highly competitive and difficult to access. • Alternative sources of income, e.g. commercial research contracts and consultancy, will need to be developed. There are competing institutions, e.g. The Awen Institute, that could directly compete for these income streams.

Research and Innovation Priorities for 2022-2027

ATiC will focus on the following research and innovation priorities for the lifetime of this strategy. Detailed plans, success measures and targets are provided in Appendix 14. These will be monitored and updated on an annual basis.

Research Excellence

ATiC will develop upon it's established research activity by building a diverse portfolio of grant funded projects and commercial RD&I activity over the next five years to address this and maintain its research capacity. While investigator defined discovery research will be supported **(RE1)**, ATiC will align researcher activity to its core mission and challenge based priority areas **(RE2)** and target appropriate funding calls with suitable partners **(RE3, RE4)**, continuing to focus its activities in Health & Wellbeing. ATiC will:

- **Develop curiosity-driven discovery research**. Support the ATiC team to develop individual research interests and capabilities **(PE1)**, facilitating publishing of at least 3 outputs of REF 3* standing each by 2027 **(RE1).**
- **Develop challenge-based research.** Continue to develop ATiC's research activity focus across the spectrum of Health & Wellbeing in general, and which will meet the UK Government and Global Grand Challenge of an Ageing Society, targeting specific priority areas such as Dementia in which ATiC has already been active (REF2021), publishing at least 15 3* or above REF outputs (**RE2).**
- **Target challenge driven funding calls.** Building upon its current success rate (50%) continue to target Innovate UK with industry partners and prioritise other challenge-led funding, developing at least 10 applications to challenge based funding schemes or calls **(RE3).**
- **Increase applications for all research and knowledge exchange projects.** Research staff with SRR will be supported to submit at least two grant applications each by 2027 **(RE4).**
- **Increase funding success rate.** All staff with SRR will be incentivised to actively engage in development opportunities supporting project development and grant applications **(RE5).**
- **Develop its Open Access research environmemnt.** Ensure ATiC staff are compliant with Open Access requirements to ensure REF compliance and transparency of research outputs **(RE6)**

Civic Mission

ATiC has collaborated in projects and initiatives that meet the University's civic mission goals by promoting or improving the economic, social, environmental or cultural wellbeing of Wales in line with the Wellbeing of Future Generations Act's goals **(CM1).** We will continue to develop such initiatives:

- **ATiC+ The Mullany Fund.** The Mullany Fund is a Swansea-based social mobility charity, which works to engage young people aged 14-19 with the life sciences. ATiC will continue to deliver workshops and activities to support this charity.
- **ATiC+ The Green Gown Awards**. Two projects from ATiC were shortlisted for the UK and Ireland Green Gown Awards 2020, sponsored by the EAUC (The Alliance for Sustainability Leadership in Education), which recognise the exceptional sustainability initiatives being undertaken by universities and colleges. AtiC will continue to promote sustainable development through its research and innovation partnerships in the region.

- **Supporting NHS Wales and Local Health Boards**. ATiC has already delivered a number of significant projects that will impact on healthcare service provision and education in Wales and it will continue to seek out such opportunities.

Innovation

ATiC is now recognised as a key provider of research, knowledge exchange and innovation expertise in the region **(IN1)** and is uniquely positioned to contribute to both the University's own internal innovation activity as well as to that of its external collaborative partners in Industry and Health & Social care. ATiC will:

- **Support UWTSD KE activity.** ATiC will extend its service offer internally to develop innovative practices across the University's research portfolio, expanding upon its current activity with partners such as CIC, PERCH and WAHPL.
- **Innovation Matrix.** ATiC will be relocated to this development in 2023 and through this will play a significant role in the University's Research and Knowledge Exchange activities with world leading MNEs and high growth SMEs, attracting investment, creating jobs and economic impact in the region.

Collaboration

ATiC's external partnership network is extensive and growing. Through its contribution to the ERDF/WEFO funded ACCELERATE programme ATiC has built significant and effective partnerships with both private, public and third sector collaborators **(COL1)** and HE partners **(COL2).** To date, ATiC has engaged with 117 enterprises, working with academic, industry and health sector partners to develop and deliver 30 collaborative RD&I projects over the past three years. Key collaborative partnerships with industry, NHS Wales and academia will continue to be developed over the next five years;

- **Noldus.** ATiC's recognition by them strengthens our reputation and ability to attract grant funding and commercial research. We will continue to work with Noldus to build our network of potential collaborators, through our hosting knowledge transfer events for HEi and commercial research centres from across the UK and Europe.

- **TriTech Institute.** ATiC has established a role as a key academic partner with Hywel Dda University Health Board's TriTech Institute. We are working with the TriTech Institute to;
  - facilitate the open exchange of staff and facilities between our research centres
  - Co-develop joint funding applications e.g. Medical Research Council (MRC), National Institute for Health Research (NIHR).
  - Provide support for the NHS Scientist Training Programme (STP) in the region and co-devlop specialist postgraduate programmes and PhD's
  - Jointly exploit commercial RD&I opportunities with Industry
  - Seek opportunities for IP development and commercialization
  - Partner in a significant regional initiative, the Pentre Awel Life Science & Well Being Village, co-locating staff and co-developing RD&I activities

- **University Health Boards.** ATiC will continue its collaboration with UHBs across Wales to deliver patient-centred, clinically led research and innovation to meet the objectives identified in *Rehabilitation: a framework for continuity and recovery 2020 to 2021 (Welsh Government, updated March 2021)*. ATiC is currently collaborating with in the Rehabilitation Engineering Units (REUs) in Cardiff & Vale and Swansea Bay University Health Boards to develop a pipeline of projects and will expand this to include colleagues

in Betsi Cadwaladr University Health Board soon as part of our ambition to develop a pan-Wales Rehabilitation and Mobility Research & Innovation Network Wales

- **External Collaboration with HEI's.** ATiC will continue to develop existing collaborative partnerships with its academic partners in the region and will seek to generate new opportunities. It will
  - continue to contribute to the Accelerate programme until December 2022 and work with partners in the development of Accelerate 2.0 which is seeking to gain funding from Welsh Government, city and regional growth deals, the UK Gov Shared Prosperity and Levelling-Up Funds.
  - Develop a Design for Dementia research programme with the AWEN Institute (Swansea University) and collaborate on an Healthy Ageing Challenge - Designed for Ageing industrial research project funded by Innovate UK
  - Continue to explore international collaboration in the Far East through the established UK China Research Partnership.

- **Internal Collaboration**. ATiC will continue to develop interdisciplinary projects within the University through existing partnerships, including developing bespoke solutions for children with brain injuries with CIC, improving user experience of prosthetic devices through a collaboration between ATIC, PERCH and Welsh manufacturing company LIMB-art; improve physical literacy of young children through a collaboration WAHPL and spin-out company MiniMovers; and work with WIDI to support the development of health informatics projects witihth Welsh Health Boards.

High-level Skills, CPD & Lifelong Learning

As ATiC transitions from full ERDF funding to a mixed income model it will be able to expand its support for higher level technical and professional skills development programmes **(HS1)** both within the University and with external partners. ATiC staff will continue to provide ongoing support across the existing Masters programme portfolio, MRes and doctoral level study in Art & Design and will look to contribute to the co-development of specialist programmes that fit priority research areas and the needs of the life-science and health sector. ATiC will provide:

- **Support for NHS partners**. ATiC will continue working with HDUHB and SBUHB to support their graduate training through the NHS Scientist Training Programme (STP) through live projects and placement opportunities.
- **Support for UWTSD programmes**. Including placements on live industry linked R&D projects for existing Masters level programmes across WISA and explore potential for new micro-credentials with internal and external partners.
- **Support for new specialist PG programmes.** ATiC will explore the scope for supporting the co-development of multi-disciplinary programmes with both internal (e.g. Psychology, WIDI) and external (e.g. HDUHB) partners that can be jointly offered across the University encompassing technical/professional development that integrate fields such as Design Research, UX/UE, Health Psychology, Digital Information and Health Informatics.

Regional Regeneration

Regional Regeneration has been a priority for ATiC as one of four partners in the ERDF funded Accelerate Programme. ATiC will continue to make a significant contribution to this programme and its economic impact in the Life Science Sector in Wales, and is working with partners to develop Accelerate 2.0 **(RR1)** and apply for UK Shared Prosperity or Levelling-Up Funds **(RR2)**. Key contributions to regional development over the next five years will be:

- **Pentre Awel Life Science & Well Being Village**. ATiC is a key academic partner of HDUHB's TriTech Institute which will migrate from its current location at Dura Park, Llanelli to be based at this major £40m City Deal funded regional project from 2024. ATiC will continue partner TriTech in its clinical research and commercial activity, sharing facilities and staff between our research centres, capitalisisng on the opportunities this 'living laboratory' and its Med-tech innovation hub will offer the region.
- **Innovation Matrix.** ATiC will play a significant role in this development and support the University's Research and Knowledge Exchange activities as part of its contribution to the Swansea Bay City Deal regeneration programme.

Commercialisation & Income Generation

ATiC will work with INSPIRE and the Executive Director of Commercialisation to develop new income streams for the University **(CIG2, CIG2)**. This will build upon ATiC's network of NHS Wales and Industry partners in the Life Sciences, Health & Wellbeing sector. ATiC will build on current activity and future developments, including:

- **TriTech Institute.** A combined service and usability evaluation of a medical device for self-management of pain.
- **Innovate UK.** ATiC has a strengthening track record in collaborative research projects with industry partners funded through Innovate UK's Healthy Ageing Challenge. ATiC is developing capacity to lever more Innovate UK funding with appropriate industry partners, including Knowledge Transfer Partnerships.
- **Contract research.** Several of ATiCexisting partner companies are seeking a long term partnership with ATiC post ERDF funding to support their future RD&I needs. We are currently scoping out the nature of these commercial partnership opportunities as part of our sustainability plans.

Postgraduate Research

This is a key area targeted for development over the duration of this strategy. ATiC intends to expand its compliment of PhD students **(PGR1)**, support WISA in the development of new PGR research programmes **(PGR2)** complimentary to industry and health board collaborative partner needs, increase its supervision capability and enhance its post-doctoral research environment **(PGR3, PGR4)**. Over the next five years, ATiC will continue to develop:

- **External collaborative PG research**. ATiC and TriTech will seek additional funding sources to support a further 5 PhD studentships by 2027 to address unmet clinical needs.

- **Internal collaborative PG research.** ATiC will work with internal partners, such as PERCH, to identify opportunities to build upon existing projects and secure for post-doctoral funding to further progress current research opportunities
- **ATiC's PGR supervision capacity.** Engage with the Doctoral College to enhance our research environment, identify and meet doctoral supervisor training and development needs and support all eligible staff to undertake PGR supervision

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People

ATiC will implement the actions of the Researcher Development Concordat **(PE1)**. All research fellows at ATiC have had a 6-month probationary period during which they were encouraged to identify and develop personal research interests that aligned with ATiC's priorities and strengthened ATiC's methodological approach to research and innovation. This will be used to inform future individual research targets . Over the next five years, ATiC will:

- **Develop individualised Researcher Action Plans.** These will include targets for outputs of REF standing and will be co-produced and monitored on an annual basis.
- **Mentor Early Career Researchers (ECRs).** Support staff with publication and individual grant applications. Staff will be encouraged to seek additional central seed funding support from INSPIRE, through its merit-based research and commercialisation support fund, to reward individual research activity.
- **Support Researcher Development**. Incentivise and support ATiC staff to achieve full research and REF submission potential through targeted CPD.

18. Digital Health Informatics

Research Themes and Centres

The Wales Institute of Digital Information (WIDI) 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.

Research Excellence and Innovation

WIDI's vision is to be a leader in the research development of digital health and care for Wales. The evolution of digital technology in health and care is ever changing and to be ahead of the rest is our aim at WIDI. To support this, our research is led by Professor Andrew Ware of USW. Working with the NHS Wales Informatics Service and the rest of NHS Wales we can play a major part in researching digital technology whilst understanding the needs of those working in the service, as well supporting the need of the patient By working in collaboration with our two leading digital academic institutions in Wales, Digital Health and Care Wales and the NHS Wales health boards, WIDI has become recognised as a knowledge base for digital based research, enabling dimensions of information and digital technology to be used for social, political and economic development **(RE2, IN1)**. Examples of collaborative research currently includes:

- **Cwm Taf Morgannwg University Health Board**: investigating the use of voice monitoring and AI to analyse Chronic Obstructive Pulmonary Disease (COPD) in patients. This project will aim to use AI to measure the development of COPD in patients to inform medical staff and to positively modify patient lifestyle choices

- **Swansea Bay University Health Board:** Research Trials Portal in conjunction with Swansea Bay HB Urology Department to direct Urology patients to the most relevant research trials, this has now passed stage 1 and is ready for further development using volunteer patients and collaboration with other health boards.

- **Cwm Taf Morgannwg University Health Board**. Undertaken with Newydd Housing Association, Get Fit Wales and Schools, research has been commissioned to develop a system for monitoring population health. This will use gamification methods to positively modify behaviour related to personal health, fitness and food

consumption. This will involve large amounts of data gathering, data analysis and visualisation methods.

- **Cwm Taf Morgannwg University Health Board**: using e-Whiteboards to provide ward based patient data to nurses, stage 1 has been completed and is now being implemented at two major CTM hospitals. Stage 2 is being developed and will involve integration with patient records while a potential stage 3 may involve Augmented Reality technology e.g. Google Glass, to provide selected data to nurses.

Collaboration

With our partnership between health, care, and academia **(COL1, COL2),** WIDI understand the needs of service through engagement and have the skills, knowledge and innovation to develop digital technology to support the service needs and product design. Working under the Director of Innovation and Engagement, Professor Ian Wells (UWTSD), and having extensive access to digital labs we can use cutting edge technology to best understand the digital experiences and requirements whilst providing rigorous testing in our unique environment. WIDI already has active collaborations with DHCW and USW as partners in the initiative and is working with several health boards on research and other projects.

- **Health Boards**. We currently work closely with Cwm Taf Morganwyg University Health Board, Swansea Bay University Health Board and Hywel Dda University Health Board and we have signed or are in the process of signing further MOUs with other health boards in Wales. Our target is to have an MOU signed with the majority of Welsh Health Boards within 3 years.
- **Other bodies**. We are also seeking to develop active relationships with other bodies such as Respiratory Innovation Wales and the National Imaging Academy Wales. We have also via the MSc in Digital Skills for Health and Care Professions successfully collaborated with NHS Wales and Social Care Wales which will continue for at least a further 3 years.

High-level Skills, CPD & Lifelong Learning

Led by Professor Wendy Dearing (UWTSD), the aim is to enable digital technology to be used to its full potential, the development of digital skills and professional standards for the current workforce and those up and coming is paramount. To support this WIDI has been committed, from the start, to inspiring and encouraging the establishment of professional standards in the field of Health Informatics, developing academic qualifications and personal development opportunities for full time digital degree students, as well those working in health and care and offer lifelong learning in digital and health informatics **(HS1)**. Opportunities have led to professional digital courses and accredited qualifications being developed from a Level 2 Health Informatics right through to PhD's in specialised career-based doctorates. All these are delivered by working with the world class expert teaching staff within the WIDI Partnership. Not only does WIDI support those already working with digital technology, we are also supporting those whose roles are evolving following the implementation of digital systems into their daily tasks. The development and encouragement of fulltime students, our workforce of the future, is vital and we aspire to share individual practice, international experience and expertise of those currently working

with our partnership organisations from a local and national perspective. Current provision includes:

- **Health Informatics (Level 3 – Level 4).** Delivered by Coleg Sir Gâr the online Health Informatics qualifications are for those working in or new to the area of Informatics in the Health and Care Sector and are keen to gain new skills to carry out their job roles as well as preparing them for career progression. In addition, students could potentially move on to study for a Digital Degree Apprenticeship qualification once completing a Health Informatics course. The Health Informatics course is a fully funded by a Welsh Government initiative for those working within health and care in Wales and is set to continue in future years (HS1)
- **Digital Degree Apprenticeships.** Digital Degrees Apprenticeships are Welsh Government funded opportunities to combine your work-based learning with studying a degree part-time at a participating University. Apprentices can achieve a degree, learn professional skills, and gain industry knowledge. UWTSD offers four, fully funded, part-time Digital Degree Apprenticeship courses. DDA qualifications can be studied in Applied Data and Information Systems, Applied Computer Networks and Cybersecurity, Applied Software Engineering and a new course has just been launched in Cloud Software Development.
- **MSc - Digital Skills for Health and Care Professions.** A collaboration started in October 2021, between UWTSD, NHS Wales and Social Care Wales with 60 Welsh Government fully funded places for at least 3 cohorts
- **Collaborative Postgraduate Research.** A total of five staff from DHCW are currently engaged in MRes and doctoral (PhD) research degrees though WIDI which are focussed on important issues that need resolving for the organisation.

Regional Regeneration, Commercialisation & Income Generation

Regional Regeneration, concerning the provision of excellent healthcare services to improve population health, is a key priority for WIDI. These are directly related to the regeneration priorities of Welsh Government, Local Authorities and other national bodies, for which regeneration funds are available, through for example the regional growth deals, city deals, community renewal funds and UKRI strength in places fund **(RR1, RR2)**. Current projects include:

- **Pentre Awel/ Llanelli Wellness Centre**. WIDI is working closely with HDUHB in developing the future Pentre Awel/ Llanelli Wellness Centre. WIDI will be closely involved with the education skills and training parts and the research parts of this major £40m City Deal funded regional project
- **Welsh Institute of Digital Information (WIDI), Research and Development Centre in Newport.** £745k has been awarded to WIDI through USW to form the Research and Development Centre for the Welsh Institute of Digital Information, at the Newport Campus of the University of South Wales. Regional regeneration activities will include the consolidation of WIDI's ongoing research collaboration with the region's health boards and the design and prototyping of an online Digital Health Village to provide enhanced professional training. The centre will also develop online teaching material related to Digital Health and Care to form a new BSc and MSc provision in

Digital Health and Care. Research will also maximise the use of Artificial Intelligence in the delivery of health and care services.

- **IP Development.** Companies that WIDI are working with on health-related projects would be helped to access funding though our collaborative arrangements, including that for IP exploitation, product development and market launch **(CIG1)** and the formation of spinout companies **(CIG3)** which service healthcare needs in Wales.

People

Currently there are 7 fractional staff that are working on WIDI projects from UWTSD and a similar number from USW. This was made possible due to a grant of £670,320 via the Higher Education Funding Council for Wales: Higher Education Investment and Recovery (HEIR) Fund. UWTSD resource includes 7 seconded staff, two full time research assistants, and two full time academic demonstrators. WIDI will utilse research regeneration and commercial income to maintain and grow this staff base **(PE1).**

19. STEM

Research Themes & Centres

UWTSD's STEM (Science, Technology, Engineering, and Mathematics) research activities are based in Wales Institute for Science & Art (WISA). This activity is multidisciplinary drawing on staff within three main areas of STEM (Advanced Manufacturing & Engineering, Built & Natural Environment and Applied Computing). These should not be considered as three separate and distinct pillars of activity, but rather three lines of enquiry which will be mutually supporting due to significant synergies in the development and application of emerging, digital technologies and digitalisation.

Advanced Manufacturing & Engineering (AME)

Research and Innovation in the AME areas will build upon specialist centres and funded projects including the Wales Centre for Advanced Batch Manufacture (CBM), Manufacturing Advanced Design Engineering (MADE) and the SMART Digital Accelerator projects. The 2022-2027 Research and Innovation strategy will be aligned to the following priority areas:

- Digitalisation in Manufacturing / Industry 4.0 technologies
- Efficient, Resilient and Sustainable Manufacturing Systems and Supply Chains
- Additive Manufacturing and Batch Production Applications
- Non-Destructive Testing & Evaluation (NDT&E)
- Off-site / Modular Manufacturing

SMART Construction and Decarbonisation (ACE)

Research and Innovation in the Built and Natural Environment areas will build upon specialist centres and funded projects including the Construction Wales Innovation Centre (CWIC). A Cradle to the Grave approach from resource sourcing to end use and waste minimisation draw 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

Applied Computing

Computing has the knowledge and expertise to enhance the technological, innovative and digital workforce in all sectors (public & private) through research and projects development in the Computing Research and Innovation Centre (CRIC). Priority areas are:

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

Strengths		Weakness
• STEM researchers have an emphasis in applied research and knowledge to deliver impact through established collaborators and partnerships. • Well established, funded projects focusing on Advanced Manufacturing & Engineering have good brand awareness within Wales (MADE Cymru & SMART Digital Accelerator). • UWTSD recognized externally for expertise and competencies in the development and delivery of Welsh Government SMART Partnerships (Knowledge Transfer Projects). • Growing number of dedicated research focused staff (Research Associates & PhD Studentships) in Advanced Manufacturing & Engineering subjects, funded through projects.	**Internal Factors**	• More than 50% of the staff in the unit have less than 30 days a year allocated to research. This leaves little time to develop funding applications and develop research outputs. • WISA staff typically work on applied research and experimental development projects. The expectation to publish the results of this research and innovation activity is not embedded within this project-based research environment. • Grant applications to competitive sources such as EPSRC, Innovate UK and Horizon Europe will therefore be markedly less competitive where these are lacking. • The departure of some research-focused staff members has reduced the critical mass needed for the continued success and expansion of successful research areas. • Low number of staff currently eligible to supervise PhD research and/or MSc by Research.
Opportunities		**Threats**
• CRIC has considerable strength in digital technology to establish interdisciplinary, collaborative, and partnerships with key research units within the University, industries, and other organisations as well as advisory and consultancy roles. • Many UKRI, Welsh Government and European funding streams are aligned to challenge driven, rather than curiosity led, research in digitalization within manufacturing. • A key priority has been to develop collaborative and funded projects with industry and to maintain research collaboration and commercial development of various NHS Wales health board through WIDI. This will develop opportunities through industrial engagement and research studentship to build the next generation work force. • Contract research and consultancy services are well established in our research priority areas with considerable growth potential. This will underpin our research base.	**External Factors**	• Failure to invest in areas where there have been successful publications/income generated can affect staff retention and that in turn can reduce the number of postgraduate opportunities moving forward. • European funding streams no longer available due to Brexit. • As STEM research output was combined with Art & Design for the previous REF submission, benchmarking will be limited. • Other institutions and RTOs refocusing their resources and activity to better align to challenge-driven Manufacturing and Digital Technology funding streams.

Research and Innovation Priorities for 2022-2027

The following research and innovation priorities will form the basis of STEM research for the lifetime of this strategy. Detailed plans, success measures and targets are provided in Appendix 17. These will be reviewed and monitored on an annual basis.

Research Excellence

WISA will develop upon its established research activity by building a diverse portfolio of grant funded projects and commercial RD&I activity over the next five years to address this and maintain its research capacity. Challenge-based **(RE2)**, rather than curiosity-driven **(RE1)** research will be prioritized, thus aligning UWTSD capabilities and activity to UKRI, UK Government and Welsh Government priorities and funding opportunities **(RE3)**. The centres will:

- **Develop challenge-based research.** Continue to develop the STEM research portfolio across the spectrum of research activities detailed below. Publishing at least 40 research outputs of REF 2* and above (**RE2).**
- **Develop curiosity-driven discovery research**. Support STEM researchers to develop individual research interests and capabilities **(PE1)** where these align to the centres' overall research priorities facilitating publishing 80 outputs of REF 2* standing by 2027 **(RE1).**
- **Target challenge driven funding calls.** Target EPSRC, Smart Grants, Innovate UK, NIHR and Horizon Europe funding with industry partners and prioritise other challenge-led funding, developing at least 40 applications to challenge based funding schemes or calls **(RE3).**
- **Increase applications for all research and knowledge exchange projects.** Research staff with SRR will be supported to submit at least 20 grant applications each by 2027 **(RE4).**
- **Increase funding success rate.** All staff with SRR will be incentivised to actively engage in development opportunities supporting project development and grant applications **(RE5).**
- **Develop its Open Access research environment.** Ensure STEM researchers are compliant with Open Access requirements to ensure REF compliance and transparency of research outputs **(RE6)**

Priority areas for RE1, RE2, RE3 and RE4:

Advanced Manufacturing & Engineering. To maintain the employment of current research staff, many of whom are employed on ERDF and ESF projects, and to grow capacity in Advanced Manufacturing & Engineering, we will prioritise publication and grant funding in:

- **Digitalisation in Manufacturing / Industry 4.0 technologies**: Research focused on the application and deployment of digital technologies and digitalisation to enhance and optimise operational performance within industrial contexts.
- **Efficient, Resilient and Sustainable Manufacturing Systems and Supply Chains:** Lean systems, principles and techniques which underpin continuous improvement initiatives at an enterprise-wide level. Focused on improving quality, increasing efficiency, and reducing operational waste.
- **Additive Manufacturing and Batch Production Applications**: The Wales Centre for Advanced Batch Manufacture (incorporating Component Batch Manufacture Wales and the Advanced Manufacturing Skills Academy), will focus on the development and

manufacture of patient specific implant systems (PSI) for veterinary and human applications.

SMART Construction and Decarbonisation. Expertise will be drawn from the three pillars in the School (Architecture, Construction and Environment), together with some cross disciplinary input from Applied Computing, Engineering and Applied Manufacturing in the following areas:

- **Environmental and Industrial Decarbonisation**. Phytoremediation research on contaminated mine spoil in Wales is being further developed in terms of carbon capture but will additionally apply to the construction industry supply chain.
- **Application of Digital Technologies in Built and Natural Environments, Reality Capture and 4D BIM.** The application and deployment of digital technologies across the built and natural environment to enhance and optimise operational performance within industrial contexts.
- **Green Infrastructure and Biophilic Design.** Research on green infrastructure that builds resilience against climate change, offers healthy, biodiverse and smart solutions and to the local community.
- **Modern Methods of Construction:** Design, construction and deconstruction of buildings using innovative materials and practices, including welsh timber products, focused upon solutions that can be easily integrated by industry, in turn improving process efficiency, quality and a deeper circular ethos within organisations.

Applied Computing. The Computing Research and Innovation Centre (CRIC) vision is to be a leader in latest and future technologies in research excellence to establish portfolio of grants, SEED, interdisciplinary and collaborative funded projects. We will focus on the following research challenges:

- **Cybersecurity & Blockchain:** developing mitigation technology for cybersecurity solutions.
- **Machine Learning (ML) & Artificial Intelligence (AI):** healthcare solutions including AI aided diagnosis, gamification methods to positively modify behavior related to personal health, fitness and food consumption, augmented reality technology and data analytic models for patient access to health care records,
- **Smart Internet of things**: interdisciplinary research on Innovative Sensor and Network Monitoring using SMART IoT.

Civic Mission

WISA will develop projects and initiatives that engage in the University's civic mission goals by promoting or improving the economic, social, environmental, or cultural wellbeing of Wales and beyond **(CM1)**. We will contribute STEM widening access & community engagement **(CM2),** through research and knowledge exchange projects that supports the development of social enterprise, business skills and employability or supports social innovation and entrepreneurship opportunities for undergraduates and educational leaders.

Advanced Manufacturing & Engineering. With few exceptions, challenged-based research, and knowledge transfer activity in the Advanced Manufacturing & Engineering subject areas will focus on improving the competitiveness and resilience of organisations within the region through the following activities:

- **Resilient manufacturing.** Support organisations in the development of efficient, resilient manufacturing systems and supply chains through the adoption of lean principles and operational performance improvement frameworks **(CM1).**
- **AI, AR and VR**. Support manufacturers in the adoption of digital technologies such as blockchain, Artificial Intelligence (AI), Machine Learning, Co-bots, Smart Automation, Mixed/Extra Reality (AR & VR) and Connected, Intelligent Systems **(CM1).**
- **Patient Specific Implants.** Continued research and development in the field of patient specific implants (PSIs) for human and veterinary applications with a focus on novel locking systems to streamline operations **(CM1)**.
- **Upskilling.** Developing effective pedagogy and learning platforms for industry focussed upskilling with a focus on industrial digitalisation **(CM2).**

ACE and CWIC. In alignment with the Wellbeing Goals, projects, research, and teaching within ACE aims to provide, economic, social, cultural, and environmental benefits across Wales and the UK. Existing retrofit projects, the drive towards net zero, and green infrastructure implementation will deliver community benefits in terms of energy efficient homes, cost effective construction and land reclamation for recreational and timber industry benefits. Projects include:

- **Timber Research Centre.** Research developed through the Timber Research Centre in Lampeter aims to provide innovative and commercially viable products that are home-grown and can sustain the Welsh supply chain in construction. This will in turn provide educational and employment opportunities **(CM1).**
- **Green infrastructure.** Projects aim to create a network of multifunctional spaces, urban or rural, which can improve the quality of life for communities. ACE is already undertaking a number of building design projects and building performance monitoring which will align with the philosophy of SMART buildings. **(CM1) (RE3).**
- **Blaenavon**. A key feature of the Blaenavon phytoremediation project is to create a healthier community resource in a deprived region of Wales that has a legacy of contaminated land and restricted green space **(CM1) (RE1).**
- **Down to Earth.** Collaboration with the Down to Earth Project has the potential to offer both project-driven and educational opportunities to those in society who are often marginalised or who have fewer educational opportunities available to them. **(CM1).**
- **Design for Deconstruction.** Existing research in areas such as Design for Deconstruction and Circular Economy, in addition to aspirational areas such as Welsh timber products and construction (Wood Knowledge Wales) will enable more well-informed supply chains that value economic, social, environmental, and cultural benefits **(CM1).**

Applied Computing. Computing will align with the University's Civic mission goals and develop projects around:

- **Artificial Intelligence & Machine Learning:** 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 behavior related to personal health, fitness and food consumption, augmented reality technology and data analytic models for patient access to health care records.
- **Immersive Learning:** Continue to partner 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.
- **Cyber Security**: Continue development and strengthen support with the Widening Access and Community Engagement workshop and training to promote ICT as

education and career path from early ages of education to increase girls taking the ICT and technical course in cybersecurity and computer networks as their preferred choice.

- **SME support**: Building future opportunities for collaboration with Thales group in Ebbw Vale and MADE CYMRU to support local SME, academic research & projects, and STEM & apprenticeship education program. Continue to work with local SME, Evolvement to provide internship and work experience to our local students.
- **Education:** In partnership with Birmingham City University (BCU), Technical University Dublin (TUD) and Open University (OU) on training teachers and social responsibility outreach projects.

Innovation

Advanced Manufacturing & Engineering. All research and knowledge transfer activity undertaken in Advanced Manufacturing and Engineering, is challenge-driven and is guided by industry demand. As such, measurable and evidencable impacts, such as productivity improvements, increased capabilities or improved quality levels are routinely measured and recorded **(IN1)**. The following areas will be developed to deliver economic and societal impact:

- **Industry 4.0.** Inter-disciplinary research and development to support the adoption and deployment of digitalization and digital technologies within industrial applications. Examples include: blockchain, artificial intelligence and machine learning, cyber security, big data, and smart sensors. Staff supporting the delivery of funded research and innovation projects such as MADE Cymru (WEFO), Connected Everything (EPSRC), SMART Digital Accelerator (Welsh Government) as well as research active staff from Applied Computing will collaborate in this area.
- **Artificial intelligence**. The development of low-cost, artificial intelligence enabled vision systems through collaboration with the Connected Everything research network. This work will be supported by activity undertaken through the SMART Digital Accelerator project.

ACE & CWIC. The School of Architecture, Construction and The Environment, supported by CWIC have identified four areas for the development of societal impact **(IN1)**, which will be supported and developed through targeted impact initiatives:

- **Environmental and Industrial Decarbonisation:** The Social Impacts of industrial decarbonisation through new build, retrofit, phytoremediation and land reclamation. This allows us to align with the societal impact goals by enabling cultural change with the goal of developing carbon literacy and a low carbon economy.
- **Application of Digital Technologies in Built and Natural Environments, Reality Capture and 4D BIM:** Our research in digital technologies will allow us to demonstrate to industry the impact that cost effective solutions can have on them. Our inter-disciplinary work on reality capture has demonstrated how these technologies and practices are transferable cross-sector, demonstrating the value and driving wider adoption of retrofit 4D BIM models.
- **Green Infrastructure and Biophilic Design**: Impact initiatives within green infrastructure aim to support the creation of multifunctional spaces, urban or rural, which can improve the quality of life for communities. ACE is already undertaking several building design projects and building performance monitoring which will align with the philosophy of SMART buildings. Our work being adding value to a number of stakeholders such as local authorities and Social Housing Providers.

- **Modern Methods of Construction:** MMC and Design for Deconstruction (DfD) research is providing insight into end-of-life building materials, minimising raw material use within the construction process, reducing waste and pollution, improving process efficiency and quality throughout supply chains.

Applied Computing. Computing have identified four areas for the development of societal impact **(IN1)**,which will be supported and developed through targeted impact initiatives:

- **Cybersecurity & Blockchain:** Inter-disciplinary research and project development with MADE CYMRU on the Social Impacts of Industry 4.0 and the effect Industry 4.0 on the wider community enabling Welsh industries to develop essential skills and job opportunities in key areas of Industry 4.0 technology. In addition, impact initiatives will be developed around new interdisciplinary research on the detection, analysis, and prevention of botnets in connected autonomous vehicles (CAV).
- **Machine Learning (ML) & Artificial Intelligence (AI)**: Impact initiatives will be developed around continued research on the ASTUTE2020 project to develop a bespoke Augmented Reality engine with A.I. feature recognition, to support regional manufacturing companies.
- **Smart Internet of things (IoT) & Innovative Sensors network**: Impact initiatives will be developed around continued interdisciplinary research on Innovative Sensor and Network Monitoring of Welsh Larch Timber Frame Construction, Using SMART IoT.

Collaboration

Advanced Manufacturing & Engineering. Through extensive industrial engagement activity, UWTSD is recognized nationally for its manufacturing focused activity. Existing relationships will be strengthened and developed to explore and exploit opportunities for collaborative funding applications and research, including participation in the Wales Innovation Network **(COL2).** Collaborations will be further developed in the following areas:

- **National Research Network – Advanced Engineering & Materials**: Continued steering group membership. **(COL2)**
- **Advanced Manufacturing Research Centre (AMRC) Cymru**: The AMRC Cymru are a key partner in the delivery of existing projects in the areas of Digital Technology Adoption as well as digitalization in the food and drink sector **(COL1).**
- **Willows Veterinary Hospital (VH), Willows(VH), Langford VH, In2Med & Hwyl Dda Health Board:** In line with the research and innovation being undertaken in patient specific implants (PSIs) for veterinary and human applications, key partnerships have been developed with Willows Veterinary Hospital, Langford Veterinary Hospital (Bristol University), In2Med Ltd. as well as Hwyl Dda Health Board **(COL1, COL2).**
- **Avanade & Accenture:** Building on previous studies, a strategic partnership with Avanade and Accenture is being sought to support the development of immersive, mixed reality (AR/VR) solutions for industrial applications (e.g. remote assist) as well as to facilitate best-in-class, distance learning and upskilling provision in subject areas such as manufacturing and engineering, which lean heavily on practical and interactive content. **(COL1)**
- **SINTEF University:** UWTSD staff will strengthen links with academics and researchers at SINTEF University in Norway to undertake collaborative research in the areas of manufacturing and supply chains. **(COL1)**

ACE & CWIC. We will continue to develop and widen our collaborative networks, with staff being actively involved in developing partnership opportunities with academics in Wales and other wider UK stakeholders. These will be focused on the school's own Construction Wales Innovation Centre (CWIC) groups, and the Wales Innovation network **(COL2).** Our collaborations will include:

- **Wood Knowledge Wales**: The collaboration will enable the considerable environmental research already delivered by the school to be transferred into areas that can support development of 'product and process' projects that consider land remediation, upscaling of value to home grown timber products and other opportunities that can benefit local industry and to continue strengthen our existing collaboration **(COL2).**
- **Natural Resources Wales:** Collaborative projects in development relating to Land Remediation and Green Infrastructure **(COL2).**
- **City and County of Swansea**: Collaborative projects in development relating to Green Infrastructure and Biophilic Design **(COL2).**
- **Barcud Housing Association:** Collaborative Projects related to the development of outputs linked to the University's Tir Glas vision project in Lampeter. Interest areas include MMC, Sensor Technology and Building Performance monitoring **(COL2).**
- **Down to Earth:** Collaborative Project opportunity related to Sustainable Building Methods, High Skill - Low Technology roll out of MMC and Building Performance monitoring **(COL1).**
- **MADE Cymru:** Collaborative projects relating to the sectors interest in industry 4.0 technology development on Blockchain, Operational Technology Cyber-security **(COL1).**
- **Construction Scotland Innovation Centre / Edinburgh Napier University:** Knowledge transfer and collaborative projects in areas related to Offsite Manufacture, in addition to the education underpinnings required to enable delivery **(COL1).**
- **Interdisciplinary research**. We will develop internal interdisciplinary projects within the University by collaborating with Computing, Advanced Manufacturing & Engineering, Education, Business School and Psychology **(COL2).**

Applied Computing. We will develop our collaborative networks, with 10 staff being actively involved in developing partnership opportunities with academics in Wales through for example the Wales Innovation network **(COL2)** and other stakeholders **(CO1)**. These will be focused on the Computing Research Centre (CRIC) groups. These collaborations will include:

- **ASTUTE2020**: The collaboration with Computing enable the considerable GAMES/AI/AR expertise in Computing to create an innovative and sustainable Augmented Reality 'product' that can benefit local industry and to continue strengthen existing collaborations, and develop new partnerships for the new innovative Aug Reality product project.
- **WIDI.** Working under our Director of Innovation and Engagement, Professor Ian Wells and collaborating with Computing to enhance digital workforce development in health and care and to establish innovative medical data focused research projects.
- **MADE Cymru:** Collaborative projects relating to industry 4.0 technology development on Blockchain, Operational Technology Cyber-security and Machine Learning.

High-level Skills, CPD & Lifelong Learning

High level skills are an important driver of productivity and opportunities to re-train and develop key skills is vital in a rapidly changing workplace. With a focus on flexibility,

inclusivity and resilience, WISA will deliver opportunities for career and skills development **(HS1)** in the following areas:

Advanced Manufacturing & Engineering. The School of Engineering, has works with regional employers to co-develop and deliver industry aligned, manufacturing focused postgraduate and undergraduate provision. Curriculum and content, delivery mechanisms and assessment strategies have also been closely aligned to the requirements of key industrial stakeholders. More recently, this offer has been supplemented by online provision through the MADE Cymru programmes. Following high-demand, the following areas will be developed:

- **Industry 4.0:** Upskilling modules (blended learning) funded by Industry Wales and collaboratively delivered with Industry Wales, Swansea University and Coleg Cambria
- **Micro Credentials:** In manufacturing, process improvement, digital industrial technologies and Industry 4.0 and short-course development in manufacturing core competencies.
- **Degree Apprenticeship.** Continued development of the highly successful Manufacturing and Engineering Degree Apprenticeship provision.

ACE & CWIC. CWIC has been delivering industry relevant and commercially appropriate short courses and CPD. The City & County of Swansea have identified a need for the development of green infrastructure and resilience building is required within Wales, particularly among SMEs. In response:

- **Micro Credentials**. Staff are currently engaged with the development of micro-credentials focused on GI supply chain knowledge and skill development. Funding is available through the Community Renewal Fund (CRF) in collaboration with CCS, NRW and Urban Foundry.
- **CPD**. Staff within the school are engaged in the provision of CPD within areas such as Digital Construction, Reality Capture and Drone Technologies. Many of these are being collaboratively delivered with industry partners.
- **Tir Glas**. Through the award of a further CRF funding provision aimed at Ceredigion, we are developing courses around Net-Zero Construction. These courses span from CPD to Level 4 - Level 7 and will cover all areas that can help our partners along their path to Net-Zero.
- **Upskilling**. CWIC continues to deliver many funded courses that upskill industry in areas such as Retrofit, UAV and Digital Construction Technologies.

Applied Computing. We will continue to consolidate our sector-leading expertise in technical skills and practice-based qualifications and develop micro-credentials. For example

- **Data Analysis and visualization.** Continue CPD training in Data Analysis and visualization and deliver micro-credentials within the University and wider Wales such as DVLA where we currently running specialised MSc programmes.
- **Digital Degrees Apprenticeships**. Continue our current Digital Degrees Apprenticeships in Applied Data and Information Systems, Applied Computer Networks and Cybersecurity, Applied Software Engineering and Cloud Software Development.
- **WIDI.** Continue our collaborative Postgraduate Research doctoral (PhD) research degrees through WIDI which are focused on important issues that need resolving for the organization and our Masters level pathway for NWIS and DVLA.
- **Micro Credentials**. Deliver micro credentials in areas such as Cloud storage, Cisco and EC-Council Certification Suites and other training opportunities in digital transformation.

- **Cisco: continue the successful training programmes in Computer Networks**
- **EC-Council professional certificate.** Continue provision of the Certified Ethical Hacking and Certified Hacking Forensics Investigations.

Regional Regeneration

The research centres will collaborate on regional regeneration projects in partnership with the City & County of Swansea to support their Green Infrastructure agenda **(RR1)**. Funding opportunities will be explored through collaboration, partnership, the forthcoming levelling-up funds **(RR2)** and other sources as appropriate. This will include:

- **Green Infrastructure.** CPD and training in collaboration with CWIC will assist CCS in achieving their Green Infrastructure strategic goals, providing infrastructure, built and natural, which is multifunctional, resilient against climate change, healthy, biodiverse, SMART and sustainable.
- **Wood Knowledge.** The provision of training and collaboration with research centres and partners such as Wood Knowledge Wales and the Lampeter facility to ensure that the region's training is keeping pace with emerging knowledge and technical solutions.
- **Upskilling for Industry 4.0**. Computing regeneration activities will continue to be aligned to technological advancement to companies & industries, health and wellbeing, education, and community engagements outcomes.

Commercialisation & Income Generation

The STEM fields within WISA will seek to further develop their commercialisation and income generation activities by consolidating and expanding existing contract research and constancy activity **(CIG2)**. We will be in a stronger position to pursue funding from collaborations with funded projects such as MADE Cymru and the SMART Digital Accelerator Program, secure funding for collaborative RD&I with industry through Innovate UK **(CIG1)** and commercialise IP **(CIG3)**. Current Projects and developments include:

- **Welsh Institute of Digital Information (WIDI)**: ongoing research collaboration and development of various NHS Wales health board projects which includes the use of Artificial Intelligence in the delivery of health and care services. Funding will be sought for RD&I collaborations through the ESPRC, MRC, NIHR and Horizon Europe **(CG1)** as well as competitive tenders **(CIG2),** leading to impacts **(IN1)** and the joint publication of underpinning research **(CIG4).**
- **Innovate UK**. Building on the success of Welsh Government Smart Grants, the centres will develop bidding capacity and an enhanced collaborative research offer to participate in research collaborations funded through Innovate UK RD&I grants and Knowledge Transfer Partnerships **(CIG1)**
- **Digital and Manufacturing/Engineering Degree Apprenticeship Students** which are funded by Welsh Government and currently generates significant income within STEM **(CIG2)**.
- **MSc programs.** Specialized MSc programs for the DVLA and international collaborations, through for example, to our partner institute in Wuhan **(CIG2).**
- **Security operations center (SOC)**. Based in IQ, SOC staff will be working closely with organizational incident response teams to ensure security issues are addressed quickly upon discovery. We currently have two clients (ODI and Evolvement). Computing SOC (C-SOC) will be providing teaching, training and research within the University, partners, collaborators, and clients **(CIG3).**
- **MADE Cymru**. Building on the success of MADE Cymru's online, upskilling provision,

and the appetite, for this provision outside of Wales, Advanced Manufacturing and Digitalisation online provision will be developed for commercial exploitation **(CIG3)**.

Postgraduate Research

This is a key area targeted for development over the duration of this strategy. The centres intend to expand its compliment of PhD students **(PGR1)**, support WISA in the development of new PGR research programmes **(PGR2)** complimentary to industry collaborative partner needs, increase its supervision capability and enhance its post-doctoral research environment **(PGR3, PGR4)**. Over the next five years, the STEM research centres will seek involvement in Doctoral Training Partnerships (e.g. UKRI, MCSA and KESS3) and International Doctoral Centres **(PGR1)**, investigate the market for new professional PGR programmes **(PGR2)**; develop the Doctoral research environment by hosting post-doctoral fellowships **(PGR3)** and improve the quality of the doctoral training environment **(PGR4).**

- **PhD positions**. Three PhD studentships will be appointed through the MADE Cymru project. These will focus on key digital technologies and will generate research output, aligned to the respective areas of enquiry.
- **PGR pipeline**. MSc programmes (both taught and research) will be aligned to Welsh Government SMART Partnerships and other funder priorities, to provide a potential pipeline of doctoral students in digital technologies and their application to manufacturing operations (PGR2).
- **Collaborative PhDs**. Increase the number of PhD students through PhD studentship (PG1), funded through collaboration industry partners
- **PGR supervision capacity**. Engage with the Doctoral College to enhance our research environment, identify and meet doctoral supervisor training and development needs and support all eligible staff to undertake PGR supervision **(PGR4)**.

People

The STEM subject leads will work with INSPIRE to maximise opportunities and knowledge exchange activities and submission to the next REF, and will implement the actions of the Researcher Development Concordat **(PE1)**. Specific actions:

- **Develop individualised Researcher Action Plans.** These will include targets for outputs of REF standing and will be co-produced and monitored on an annual basis.
- **Mentor Early Career Researchers (ECRs).** Support staff with publication and individual grant applications. Staff will be encouraged to seek additional central seed funding support from INSPIRE, through its merit-based research and commercialisation support fund, to reward individual research activity.
- **Support Researcher Development**. Incentivise and support ATiC staff to acheive full research and REF submission potential through targeted CPD.
- **Research Supervision**. Ensure all PGR supervisors attend appropriate training and development.

APPENDICES

MONITORING AND PERFORMANCE

Appendix 1. Measures of success
Appendix 2. Implementation / Monitoring Progress
Appendix 3. Impact Assessment
Appendix 4. Risk Assessment

STRATEGIC ACTION PLANS: INFRASTRUCTURE

Appendix 5. Researcher Development Concordat Strategic Action Plan
Appendix 6. Knowledge Exchange Concordat Strategic Action Plan
Appendix 7. Research Integrity Concordat Strategic Action Plan
Appendix 8. Doctoral College Strategic Action Plan
Appendix 9. Humanities Strategic Action Plan

STRATEGIC ACTION PLANS: RESEARCH THEMES

Appendix 10. Celtic Languages and Literature Strategic Action Plan
Appendix 11. Contemporary Arts Practice Strategic Action Plan
Appendix 12. Education Strategic Action Plan
Appendix 13. Psychology Strategic Action Plan
Appendix 14. ATiC Strategic Action Plan
Appendix 15. Wales Institute of Digital Information (WIDI) Strategic Action Plan
Appendix 16. STEM Strategic Action Plan

Document Version Control

Version No:	Reason for change:	Author:	Date of change:
V12b	First draft considered by Research Committee	Matt Briggs	08.09.2021
V12b	First draft considered by Senate	Matt Briggs	22.09.2021
V3	Incorporation of revisions required by Senate, Research Committee and Corporate Services, considered by Research Strategy Working Group	Matt Briggs	02.11.2021
V7	Second draft considered by Senate	Matt Briggs	24.11.2021
V8	Second draft considered at Research Committee	Matt Briggs	08.12.2021
V12	Final draft considered by Research Committee	Ian Walsh	17.02.2022
V14	Final draft considered by Senate	Ian Walsh	19.3.2022
V15	Final draft considered by Resources and Performance Committee	Matt Briggs	05.05.2022
V16	REF 2021 results added. Final draft (with REF2021 results) considered by University Council	Matt Briggs	07.07.2022 approved - 11.07.22

MONITORING AND PERFORMANCE

Appendix 1. Measures of success

National Measures ** D: Broadening innovation and engagement E: Increasing internationally excellent research			Forecasts					
UWTSD KPI	**Source**		**2021/22**	**2022/23**	**2023/24 ***	**2024/25 ***	**2025/26 ***	**2026/27 ***
REF Outcomes	REF 2021 Results. Overall Quality Profile.		4* 15%; 34 3* %; 2* 37 %; 1* 12%;					
REF Impact Outcomes	REF 2021 Results. Impact Sub-Profile.		4* 30%; 44 3* %; 19 2* %; 1* 7%					
Research Staff	The number of staff with SRR	All researchers	TBC	TBC	-	-	-	-
		STEMM researchers	TBC	TBC	-	-	-	-
		Non-STEMM researchers	TBC	TBC	-	-	-	-
PGR students	The total number of all PGR students (FTE).		250	300	-	-	-	-
PhDs awarded	The total number of PhDs awarded. (Baseline average 22)		25	30	-	-	-	-
Other Doctoral Qualifications Students ***	The total number of DBA's, Professional Doctorates and EdD's students (excluding PhDs).		250	300	-	-	-	-
Other Doctoral Qualifications Awarded ***	The total number of DBA's, Professional Doctorates and EdD's awarded (excluding PhDs).		25	30	-	-	-	-
Total research income (HESA)	The total amount of research income recorded on the HESA return. Baseline average £900k (Target: £ million)		£1.2	£1.8	£2.5	£2.8	£3.0	£3.3

* Targets to be set with introduction of the next Strategic Plan
** Baseline year 2020/21
*** Not included in National Measures

HE-BCI			Forecasts					
UWTSD KPI	Name	Source	2021/ 22	2022/ 23	2023/ 24 *	2024/ 25 *	2025 /26 *	2026/ 27 *
			£000s (* set in RWIF)					
4.2.1 Research income - the annual percentage change in income from (i) Research in total (ii) Research Councils 4.2.2 Total HE-BCI income per FTE of academic staff	Collaborative research involving both public funding and funding from business: Total Income	HE-BCI Table 1 - Item 1e	£100	£100	-	-	-	-
	Contract research: Total Income	HE-BCI Table 1 - Item 2h	£220	£250	-	-	-	-
	Consultancy contracts: Total Income	HE-BCI Table 2 - Item 1h	£1,000	£1,200	-	-	-	-
	Facilities and equipment: Total Income	HE-BCI Table 2 - Item 2h	£1,500	£1,500	-	-	-	-
	CPD courses and CE: Total Revenue	HE-BCI Table 2 - Item 3e	£1,500	£2,000	-	-	-	-
	Regeneration & development: income	HE-BCI Table 3 - Item 1f	£3,000	£3,000	-	-	-	-
	Intellectual Property : Total revenue	HE-BCI Table 4 - Item 3f	£175	£200	-	-	-	-

HE-BCI			Forecasts					
UWTSD KPI	Name	Source	2021/ 22 *	2022/ 23*	2023/ 24*	2024/ 25*	2025 /26*	2026/ 27*
			Number of: (* set in RWIF)					
4.2.3 Spin off activity new spin-offs and spin-offs still active after at least 3 years.	Spin-offs: number still active which have survived at least three years (HEP ownership + non HEP owned)	HE-BCI Table 4 - Item 4ai & ii	5	5	-	-	-	-
4.3.1 Start-up activity (graduate) - new start-ups and start-ups still action after at least 3 years	Graduate start-ups: number still active which have survived at least three years	HE-BCI Table 4 - Item 4aiv	650	700	-	-	-	-
	CPD courses and CE - total number of learner days delivered by Welsh HEIs for continuing professional development and continuing education	HE-BCI Table 2 - Item 3f	13,000	19,000	-	-	-	-

* Targets to be set with introduction of the next Strategic Plan

UWTSD Research and Innovation Priorities			Forecasts						
Priorities		**Source / description**	**Total**	**2021 /22**	**2022/ 23**	**2023 /24**	**2024/ 25**	**2025/ 26**	**2026/ 27**
Research Excellence			**Total**	**Number of:**					
RE1	Develop curiosity-driven discovery research in defined areas.	**Measure:** Outputs which meet REF definitions of research and are aligned with the stated research themes of the originating research centre.	**414**	38	56	72	71	89	88
RE2	Develop challenge-based research in defined areas.	**Measure:** Outputs which meet REF definitions of research and are aligned to externally defined challenge based research themes.	**178**	10	24	29	31	46	40
RE3	Target and prioritise challenge-led funding.	**Measure**: Projects developed and applications submitted in response to challenge led funding calls	**146**	20	20	24	29	29	24
RE4	Increase applications for all research and knowledge exchange projects	**Measure:** Projects developed and applications submitted to investigator defined funding schemes	**169**	17	25	32	31	32	32
RE5	Increase funding success rate	**Measure**: Overall success rate for all funding applications	**65%**	50%	55%	60%	65%	65%	65%
RE6	Develop the Open Access research environment	**Measure:** REF or funder defined open access compliance rates at or above 80% for staff with SRR (Y/N)	**80%**	Y	Y	Y	Y	Y	Y
RE7	Maintain standards in research integrity and ethics	**Measure:** Research Integrity Concordat implemented and annual report published (Y/N)	**Y**	Y	Y	Y	Y	Y	Y
Civic Mission			**Total**	**Number of:**					
CM1	Projects and initiatives that engage in the University's civic mission goals	**Measure:** Projects, initiatives or areas of activity that are promoting or improving the economic, social, environmental or cultural wellbeing of Wales and beyond (including action that may achieve any of the wellbeing goals in section 4 of the Wellbeing of Future Generations (Wales) Act 2015. (Reference: Universities Wales Civic Mission Framework).	121	21	23	22	23	17	15

CM2	Social Enterprise, Business Skills and Employability	**Measure**: Defined research and knowledge exchange projects that supports the development of social enterprise, business skills and employability or supports social innovation and entrepreneurship opportunities for undergraduates.	**34**	2	8	5	6	6	7
Innovation			**Total**	**Number of:**					
IN1	Embed innovation practices across the research portfolio to maximise the economic, environmental and societal impact of research in defined areas.	**Measure:** Research, knowledge exchange or innovation activity which has been identified as having potential impact (as defined by REF) and is being actively supported and developed by the originating research centre. (Number of projects or initiatives).	**63**	10	14	20	14	6	1
IN2	Support Knowledge Exchange	**Measure:** Implement the Knowledge Exchange Concordat (annual reporting and monitoring conducted: Y/N	Y	Y	Y	Y	Y	Y	Y
Collaboration			**Total**	**Number of:**					
COL1	Build partnerships by collaborating with researchers, businesses, the public and third sectors	**Measure:** Staff supported and number of research based collaborative partnerships, projects, and networks. (Number of collaborative partnerships, projects, and networks).	**316**	89	72	56	43	32	24
COL2	Strengthening collaborative arrangements with universities in Wales to develop critical mass.	**Measure**: Active participation, by research centre, in WIN or other Wales based projects, partnerships and networks. (Staff membership of / involvement in).	**99**	32	25	20	10	9	6
High-level Skills, CPD & Lifelong Learning			**Total**	**Number of:**					
HS1	Develop and consolidate programmes for those seeking higher-level technical or professional skills development.	**Measure:** Number of higher-level technical or professional skills development programmes including doctoral level study, micro-credentials, CPD programmes, work-based learning and other professional skills training. (Number of programmes).	**95**	21	32	21	11	6	4
Regional Regeneration			**Total**	**Number of:**					

RR1	Work with our partners on regeneration projects through the city and regional growth deals, or through other sources.	**Measure:** Projects with regeneration outcomes (including, for example: economic, built and natural environment, infrastructure, heritage culture and arts, health and wellbeing, education, skills development and training). (Number of projects)	**42**	11	9	9	5	5	1
RR2	Work with partners on regeneration projects UK Shared Prosperity, Levelling-Up Funds	**Measure:** Applications developed for Levelling-Up Funds or other regional regeneration funds	**15**	0	1	3	6	2	3
Commercialisation & Income Generation			**Total**	**Number of:**					
CIG1	Increase the number of businesses accessing financial support for innovation in collaboration with the University.	**Measure:** Collaborative funding applications submitted with businesses for research, development and innovation.	**87**	7	15	18	16	16	15
CIG2	Develop contract research and consultancy with industry, business, public or third sector organisations.	**Measure**: Submitted tenders, quotations and applications for contract research and consultancy.	**367**	47	58	62	66	68	66
CIG3	Develop spinout companies, licensing and other IP income.	**Measure:** Number of IP exploitation activities, such as spinout companies, new start-ups, and IP licencing agreements	**25**	4	4	5	5	3	4
CIG4	Number of publications with co-authors from non-academic partners	**Measure:** Outputs which meet REF definitions of research, co-authored by non-academic partners.	**71**	5	14	12	14	13	14
Postgraduate Research			**Total**	**Number of:**					
PGR1	Seek involvement in Doctoral Training Partnerships (e.g. UKRI, MCSA and KESS3) and International Doctoral Centres.	**Measure:** Involvement in collaborative PGR provision at either doctoral or masters by research level, through Horizon Europe, UKRI, Welsh Government, UKRI or other sources, or through commercial Doctoral Centres (number of partnerships)	**62**	6	11	16	7	13	8
PGR2	Develop and/or consolidate new	**Measure**: Professional Doctoral or Masters by Research level programs (number of new programmes validated)	**11**	0	4	4	2	1	0

	professional PGR programmes.								
PGR3	Develop the Doctoral research environment by hosting post-doctoral fellowships	**Measure:** Secure funding for postdoctoral opportunities and career development routes (for example as Fellowships, Research Assistants, or named researcher) or thorough a professional postdoctoral fellowship scheme. (Number of positions)	**53**	5	11	14	10	8	5
PGR4	Improve the quality of the doctoral training environment	**Measure:** Overall improvement in PRES results (Overall satisfaction %) (Environment satisfaction %)	**90%** **75%**		90% 75%		90% 80%		90% 90%
People			**Total**	**Yes / No**					
PE1	Implement the actions of the Researcher Development Concordat.	**Measure:** Implement the actions of the Concordat to Support the Career Development of Researchers (annual reporting and monitoring conducted: Y/N)	**Y**	Y	Y	Y	Y	Y	Y

Appendix 2. Implementation / Monitoring Progress

The Research and Innovation Strategy cuts across all four of the University's Institutes, their constituent research centres, and also multiple Professional Service units. Implementation and monitoring will therefore be overseen by the Research Committee, supported by INSPIRE officers.

Strategic Action Plans. Each Institute, and their constituent Research Centres will have devolved responsibility for devising strategic action plans, such that take account of the priorities, measures of success and targets which are detailed in Appendices 11-16. The Institutes will be required to report to the Research Committee on progress annually. Professional Service units, where they own actions or an area of responsibility, will also be required to devise strategic action plans, and to report on implementation on an annual basis. Action Plans for delivery of the Researcher Development Concordat, the Knowledge Exchange Concordat, the Research Integrity Concordat and the University's RWIF targets are provided in Appendices 6-10.

Operational Delivery Plan. The Research Committee, supported by INSPIRE, will develop a central Operational Delivery Plan. The plan will be supported by strategic action plans at Institute and relevant professional service unit level to ensure embedding of the priorities throughout the University. The central plan sets out the key priorities to be delivered over the coming 4 years with key milestones set for each target.

Annual Review. There will be an annual review of progress made in relation to the central operational delivery plan which will be reported to Senate and Council through Corporate Services. The annual review process will enable Senate and Council to monitor and scrutinise the progress of the University's priorities and actions in relation to Research and Innovation, through KPI's and other success measures. In addition to monitoring progress against its priorities, the central Operational Delivery Plan also:

- Facilitates coordination of cross cutting strategies and plans;
- Enables auditing of the impact and effectiveness of the strategy;
- Monitors delivery of research and innovation objectives and priorities within relevant units;
- Provides an opportunity to reflect on the appropriateness of targets;
- Ensures that the strategy can be reactive to changes in context or other sector developments;
- Engages staff and students in the development and implementation and review stage.

Revisions and updates to the Research and Innovation Strategy will therefore be made on an annual basis, this being based on the findings of the annual review. The outcomes of the REF2021 exercise will also form an important baseline in the University's five established research areas, and these outcomes will be incorporated into the strategy once announced in May 2022. The next REF exercise is expected in 2027/8, and detailed planning for that exercise will also inform any revisions to this strategy that should emerge from that process. Revisions will be made by the Research Committee, coordinated by the REF Manager.

Appendix 3. Impact Assessment

Date Assessment Completed: October 2021

Name of Strategy: Research and Innovation Strategy

Name of Lead Strategy Author: Dr Matt Briggs

Name of Strategic Lead: Prof. Ian Walsh

Is this strategy:

New ☐
Existing ☒

Briefly describe the purpose of the Policy:

The Research and Innovation Strategy 2022-2027 provides succession to the UWTSD Research Strategy 2018. The Strategy complements and supports the University's Strategic Plan 2017-2022, in particular Strategic Priority 2: Excellence in Teaching, Scholarship and Applied Research and Strategic Priority 3: Creation of Opportunities through Partnerships and Strategic Priority 4: A University for Wales. Specifically, in respect of:

- Maintaining and enhancing the international excellence of research and innovation;
- Maximising opportunities for all staff and learners to engage in scholarship, professional practice, applied research and commercialisation activities;
- Maintaining the high academic standards of our awards, and continue to participate in external assessments of teaching and research excellence;
- Supporting the economic development of the region through strategic engagement with business and civic partners;
- Continuing to work closely with the local authorities where we have campuses to maximise benefits through geographical partnerships;
- Actively engaging with public bodies and Public Services Boards across Wales, focusing on our shared commitment to the seven goals and five ways of working of the Well-Being of Future Generations (Wales) Act 2015;
- Continuing to develop programmes and research focused on protection and enhancement of the environment and natural resources;
- Contributing to the health of Wales through continued development of programmes and research focused on physical and mental wellbeing;
- Contributing to the vibrancy of Welsh culture, visual arts, heritage and language through the continued provision of high-quality Welsh-medium education and activities which encourage community participation in arts, sports and recreation.
- Diversifying the income base for the institution;
- Identifying commercial opportunities through a focused engagement on priority areas.

Indicate below to whom this Policy applies*:*

Internal Stakeholders	Staff	☒
	Students	☒
	Service Providers	☒
External Stakeholders	Partners	☒
	The wider public	☒
Others	Please specify	☒ HEFCW

Screening

Does this policy have any relevance to, or impact on, equality and diversity in the areas listed below? *(tick where appropriate):*

Possibility for discrimination / adverse impact	☒
Opportunities to promote equal opportunities	☒
Fostering good relations	☒

Indicate below whether the following has been considered during the development of this policy:

The opportunities for persons to use the Welsh language has been considered	☒
That the Welsh language considerations has been treated no less favourably than the English language	☒

Indicate below which of the following sustainable governance principles have been applied in the development of this policy:

Balancing short term need with the long term and planning for the future	☒
Working together with other partners to deliver objectives	☒
Involving those with an interest and seeking their views	☒
Putting resources into preventing problems occurring or getting worse	☒
Considering impact on all wellbeing goals together and on other bodies	☒

Evidence and data

Briefly outline any evidence / data collected for this impact assessment:

The UK Funding Councils required the University to develop, document and apply a REF2021 Code of Practice in order to define the procedures, functional responsibilities and criteria for selecting staff and outputs to include in our submission to the Research Excellence Framework (REF2021). This process included detailed equality screening and impact assessments (EIAs) to ensure that our REF procedures did not discriminate unlawfully against, or otherwise have the effect of harassing or victimising individuals because of age, disability, gender, marriage and civil partnership, race, religion or belief, sex or sexual orientation, or because they are pregnant or have recently given birth. The

Code of Practice set out UWTSD's procedures, functional responsibilities and criteria for the fair and transparent identification of staff with significant responsibility for research; determining who is an independent researcher; and the selection of outputs.
While the REF planning process, and submission, is now complete, the EIA findings, and the principles for managing research within the University, as set out in the Code and UWTSD's Strategic Equality Plan, provide valuable data and benchmarking in the current context.

REF2021 Equality Impact Assessment findings

Equality data available for consideration in the Equality Impact Assessment cover the protected characteristics of:

- Gender
- Age
- Ethnicity
- Disability
- Additionally, the EIA considered profile and mode of employment.

Gender
The gender profile of academic staff identified as Category A is 53% female and 47% male. The proportion of academic staff identified as meeting the definition of having a significant responsibility for research is 57% female and 43% male. This reflects the overall gender profile of academic staff at UWTSD, which is 54.6% female and 45.4% male (source HESA 2018/2019) and evidences a neutral equality impact in relation to this protected characteristic.

Age
Within the total academic staff population of the University the proportion in the 51 years and over group is 46% compared to 31% across the sector (source HESA 2018/19). This is reflected within the Category A staff group with 4% aged over 65. The proportion of staff identified as meeting the definition of having significant responsibility for research in this age group is 5%. This demonstrates the University's positive commitment to enabling staff research at the upper end of the age grouping. Towards the opposite end of the age grouping, 8% of total Category A staff are in the age range 26 to 34. Within the total number identified as having significant responsibility for research 15% of staff are within this age range. This reflects an encouraging and enabling culture for academic staff who may be earlier in their academic careers to engage in research.

Ethnicity
94% of the total staff population of the University declared their ethnicity. Of those who declared, 91% of the total academic staff declared their ethnicity as white (source HESA 2018/19). Similarly, 89% of the total Category A staff declared their ethnicity as white, 5% as BAME, (the remaining 6% did not declare). 1% of the staff identified as meeting the definition of having significant responsibility for research declared their ethnicity as BAME. Further review of academic staff who have declared their ethnicity as BAME identifies a number employed in areas of academic study where the current focus is towards teaching and scholarship and where there is currently no expectation of independent research within their job role.

Disability
The total academic staff of the University who declared themselves as having a disability is under 6% (source HESA 2018/19). The percentage of the total staff of the University who declare themselves as having a disability is very low, and this is reflected in the total

Category A staff group. As a result, the analysis of data for this protected characteristic is limited. 3% of the total Category A staff declared themselves as having a disability. It is worthy of note that within this small number the percentage of staff identified as meeting the definition of having significant responsibility for research is 36%.

Profile and mode of employment
85% of academic staff identified as Category A are employed on permanent contracts, 15% on fixed term contracts. The percentages of staff meeting the definition of having a significant responsibility for research is consistent at 84% and 16% respectively. 60% of academic staff identified as Category A are employed on full time contracts, 40% on part time contracts. The percentages of staff meeting the definition of having a significant responsibility for research is consistent at 61% and 39% respectively. This evidences a neutral equality impact.

Research only staff
Within the context of the overall Equality Impact Assessment, staff on research only contracts were considered. Findings for this group were consistent with the overall findings in relation to each of the protected characteristics and the profile and mode of employment. Although a number of staff are engaged on fixed term project related contracts only 20% were not considered to be engaged in independent research. As expected all staff in the upper age groupings have developed significant research output, but support for staff in the younger age groupings is also demonstrated.

Overall summary of the EIA
This Equality Impact Assessment has found that the process of identifying academic staff who meet the definition of having a significant responsibility for research has had a neutral equality impact. The determination of research independence for research only staff has been found to be of neutral equality impact.

Impact

Outline below whether the policy impacts positively or negatively on people with the following protected characteristics and the opportunities for people to use the Welsh language:

	Positive	Negative	Reasons / justification
Age	☒	☐	Delivery of the strategy will implement the Concordat to Support the Career Development of Researches, which sets out the conditions required to create the very best culture for our researchers to thrive. The Concordat has three defining Principles covering Environment and Culture, Employment, and Professional and Career Development. For each of these Principles, the Concordat outlines the key responsibilities of the three main stakeholder groups; researchers, managers of researchers and UWTSD an institution. Implementation will include actions that positively impact on protected characteristics.
Disability	☒	☐	
Gender	☒	☐	
Gender reassignment	☒	☐	
Sexual orientation	☒	☐	
Race	☒	☐	
Religion or belief	☒	☐	
Pregnancy and maternity	☒	☐	
Marriage or civil partnership	☒	☐	
The opportunities for persons to use the Welsh language	☒	☐	

Indicate below if the policy contributes towards delivery of the Well-being of Future Generation Goals:

	Positive	Negative	Reasons / justification
A prosperous Wales (efficient use of resources, skilled, educated people, generates wealth, provides jobs).	☒	☐	**Priorities: CM2, HS1, IN1, IN2, CO1, CIG1, CIG2, CIG3, PG2**
A resilient Wales (Maintain and enhance biodiversity and ecosystems that support resilience and can adapt to change (e.g. climate change).	☒	☐	**Priorities: RE2. RR1**
A healthier Wales (People's physical and mental wellbeing is maximised and health impacts are understood)	☒	☐	**Priorities: RE2. RR1, CM1, IN1**
A Wales of cohesive communities (Communities are attractive, viable, safe and well connected)	☒	☐	**Priorities: RE2. RR1, CM1, IN1**
A globally responsible Wales (taking account of impact on global well-being when considering local social, economic and environmental wellbeing)	☒	☐	**Priorities: RE2. RR1, CM1, IN1, COL1, COL2**
A Wales of vibrant culture and thriving Welsh Language (culture, heritage, and Welsh language are promoted and protected. People are encouraged to do sport, art and recreation).	☒	☐	**Priorities: RE1, RE2, CM1, RE3, RE4. IN1, COL1, RR1, RR2**
A more equal Wales (people can fulfil their potential no matter what their background or circumstances)	☒	☒	**Priorities: CM1, CM2, RR1, RR2, PGR1, PGR2, PGR3, PGR4**

What action will be taken to reduce negative or adverse impacts identified?

No adverse impacts have been identified in the current screening. However, a detailed EIA will be undertaken on the Strategy at the end of Year 2 using the REF2021 EIA as a benchmark. Corrective measures will be introduced that point, should any negative impacts be identified.

Publishing and reporting

Assessments highlighting significant negative / adverse impacts are required to be published. The Equality Manager / Welsh Language Co-ordinator will work with you to ensure that the assessment is suitable for publication.

Details of assessments will be presented to appropriate internal equality, Welsh language, and sustainability monitoring committees.

Outline below how this policy will be published:

The Research and Innovation Strategy will be published in Welsh and English on the University's webpages, and launched with an information session for all staff and students. The strategy will also be cascaded to staff and research students through the Institutes' research committees and the Doctoral College Board. Key commitments in the Knowledge Exchange Concordat and also the Researcher Development Concordat, are to incentivise, support and reward staff for excellence in research and innovation activity. The Strategy, its priorities and targets, as well as progress in implementation, will therefore also be communicated through staff and PGR student induction, the performance and development review process, research planning and other staff and PGR student development activity.

Monitoring and review

When will this impact assessment be reviewed? Sept 2024

Who will be responsible for the review? INSPIRE

How will you monitor the policy in the meantime? Annual progress reporting. A full EIA will be conducted at the end of Year 2.

Review by the Equalities Manager or equivalent:

Please indicate whether you are satisfied that all appropriate action has been taken to **promote equality** within the policy: No further action is required: ☐ The Policy requires adjustment to remove barriers or better promote equality: ☐ Please give a brief outline of any remedial required, and whether this has been addressed in the version submitted for approval. If a decision has been taken not to address the remedial action identified then a full explanation of this should be provided: Stop and remove the Policy: ☐ the policy shows actual or potential unlawful discrimination.

Approval

The Strategy will be formally considered and approved in accordance with Committee Terms of Reference outlined in the Academic Quality Handbook.

Appendix 4. Risk Assessment

Potential Impact scores (a): *1 = Insignificant, 2 = Low, 3 = Medium, 4 = High*

Probability of occurrence (b): *1 = Unlikely, 2 = Likely, 3 = Very Likely, 4 = Certain*

Current Risk Level: *High = impact score is 12 and above, Medium = impact score is between 6 and 11, Low = impact score is 6 or below.*

Change*: NEW – if risk is new, ↔ - no change to risk status, ↓- risk status downgraded, ↑- risk status upgraded*

Impact Score Impact Assessment Score (c): *(a) x (b)*

Risk Category	Risk Ref	Date Reported	Risk Detail	Risk Holder	Risk Response	Impact (a)	Probability (b)	Impact Score (c)	Current Level	Change
Strategic & Operational	RI1	Nov 21	**Business continuity.** Detailed planning and monitoring is required to drive performance and continued improvement in research and innovation activity, and respond to the evolving policy and funding environment.	Chair RC	The strategy and strategic action plans for each area of activity and the associated research centres establish detailed plans for research and innovation activity, with SMART targets. These will be monitored and reported on annually. The strategy will be updated annually in response to emergent strengths, opportunities, weaknesses and threats. Resource issues will be reviewed on an annual basis.	3	2	6	M	NEW
Operational	*RI2*	*Nov 21*	**Compliance.** The strategy includes a detailed gap analysis of the University's provision in the research and knowledge exchange infrastructure, which includes compliance issues around collaboration	Chair RC	The University will implement the Knowledge Exchange Concordat, ensure that we meet UKRI principles on 'Trusted-Research' and review implementation of the Research Integrity Concordat. Progress on	3	3	9	M	NEW

			(e.g. IP, confidentiality, contractualisation, UKRI 'trusted research'), financial management of grant funding and issues of research ethics and integrity. It also considers compliance in funder mandates for open access to research output.		implementing the Knowledge Exchange Concordat will be communicated to HEFCW annually through our RWIF reporting. The University will publish an annual research ethics and integrity report.					
Strategic & Operational	*RI1*	*Nov 21*	**Financial performance and sustainability**. The University's research and innovation activity is underpinned by competitive research income, hypothecated quality related funding (based on REF metrics) and core research and innovation funding from HEFCW (RWIF). Each area is dependent upon research and innovation performance, and detailed plans are required to protect existing income and attract new sources.	Chair RC	The strategy and strategic action plans for each area of activity and the associated research centres establish detailed plans for research and innovation activity, with SMART targets for funding. These will be monitored and reported on annually. The strategy will be updated annually in response to emergent strengths, opportunities, weaknesses and threats. To drive performance, the University will implement the Concordat to Support the Career Development of Researchers	3	2	6	M	NEW
Strategic	*RI1*	*Nov 21*	**Quality**. High quality research and innovation requires a high quality research environment with adequate support and resources. This is defined in the strategy.	Chair RC	REF2021 performance will be reviewed as part of strategic planning. The strategic planning cycle for the strategy aligns with the next REF cycle. The strategy and strategic action plans for each area of activity and the associated research centres establish detailed plans for research and innovation activity, with SMART targets for research output. To drive performance, the University will implement the Concordat to Support the Career Development of Researchers.	3	3	9	M	NEW
Strategic & Operational	*RI1*	*Nov 21*	**Reputation**. The University's research and Knowledge Exchange activity is a key area in which our reputation is established and defined. It is also an area that positions us in league tables and other metrics which are	Chair RC	The strategy and strategic action plans for each area of activity and the associated research centres establish detailed plans for research and innovation activity, with SMART targets for research output. To drive performance, the University will implement	3	2	6	M	NEW

			key measures in our financial performance and sustainability.		the Concordat to Support the Career Development of Researchers. To address operational risks the University will implement the Knowledge Exchange Concordat, ensure that we meet UKRI principles on 'Trusted-Research' and review implementation of the Research Integrity Concordat.					

STRATEGIC ACTION PLANS

(Infrastructure)

Appendix 5. **Researcher Development Concordat Strategic Action Plan**

Appendix 6. **Knowledge Exchange Concordat Strategic Action Plan**

Appendix 7. **Research Integrity Concordat Strategic Action Plan**

Appendix 8. **Doctoral College Strategic Action Plan**

(Research Centres)

Appendix 9. **Humanities Strategic Action Plan**

Appendix 10. **Celtic Languages and Literature Strategic Action Plan**

Appendix 11. **Education Strategic Action Plan**

Appendix 12. **Psychology Strategic Action Plan**

Appendix 13. **Contemporary Arts Practice Strategic Action Plan**

Appendix 14. **ATiC Strategic Action Plan**

Appendix 15. **Wales Institute of Digital Information (WIDI) Strategic Action Plan**

Appendix 16. **STEM Strategic Action Plan**