

Institution: University of the West of Scotland

Unit of Assessment: UoA11

a. Context

Staff submitted under UoA11 are based within the School of Computing and the School of Social Science. The activities within UoA11 are generally multi-disciplinary covering interactive creative technologies, ICT in education and audio-visual communications and networks. The unit's research ethos is one that emphasises the importance of applied research, which in turn reflects the University's mission statement, and encourages multi-disciplinary approaches to the research that is carried out.

At the time of the last RAE the unit's research agenda was overseen by the School of Computing and focussed on two areas: ICT in Education and Intelligent Systems. Since then, the University embarked on a process of restructuring its research to support groups of scale, and 18 new Institutes or Groups have been formed. The University confirmed new investment of some £1m per annum into these Institutes over the next 4 years and these are the focus for all research activity across the University. In UoA11, the university established the Institute of Creative Technologies and Applied Computing (ICTAC) (<http://www.uws.ac.uk/ictac>) to build on developments within the unit since the last RAE. The Institute consists of 3 research centres: ICT in Education (ICTE), Interactive Creative Technologies (ICT) and Audio-Visual Communications and Networks (AVCN) and a research group in Database and Knowledge Management (DBKN). At the time of the last RAE, the unit had recently created the Scottish Centre for Enabling Technologies (SCET) and this Centre has become the focus for underpinning R&D and Knowledge Exchange with companies carried out by our unit.

All research active staff and PhD students are aligned to at least one research centre/group and these centres/groups provide support and resources for the development of applied research. Collaboration within and between group members is encouraged through the prioritisation of research bids and other forms of research support.

b. Approach to impact

The submitted impact studies reflect the unit's approach to embed potential impact into research work through engagement with external organisations and end users. In particular, the ICT in Education (ICTE) Research Centre collaborate with a large number of European partners to develop impact. The Centre were instrumental in persuading the European Commission to fund an FP7 Network of Excellence in Serious Games (Gala) worth €5.65m to harmonise and focus research in this area. The Centre also obtained funding for a second Network in Web2.0, again to harmonise and focus the research in Web2.0 technologies for education and training. Since RAE2008, the Centre have coordinated/partnered in 13 EU projects. The Centre also run the annual European Conference in Games-based Learning (ECGBL) to support research in these areas. These collaborations have helped the Centre to have a positive economical, policy and societal impact.

The Interactive Creative Technologies Centre work closely with the Scottish Centre for Enabling Technologies (SCET) to provide R&D and Knowledge Exchange in enabling and emerging technologies to organisations. The initial work was supported by grants from Scottish Government and Scottish Enterprise and subsequently supplemented by support from the Scottish Funding Council, the Technology Strategy Board (7 KTP projects, 2 graded Outstanding) and direct funding from companies to undertake R&D on their behalf. SCET has also helped to establish and run a series of annual conferences in Glasgow to support companies (Digital 2011, Digital 2012 and Digital 2013). These approaches have helped the Centre to run over 175 R&D projects in the last 5 years creating almost **500** jobs and safeguarded a further **940** jobs, and increasing company R&D by over **£4.6m** and company turnover by over **£80m**.

In both of these cases much of the research has been commissioned by government bodies, national and international, with the specific aim of providing economic, societal and policy impact, which we believe have been achieved.

Impact template (REF3a)

Staff are supported by the university for knowledge exchange and research activities through appropriate reductions in administrative and teaching duties, through funding for equipment and through internal studentships.

c. Strategy and plans

The current strategy will be continued and developed over the next few years. Collaboration and external funding will continue to be key to the strategy (for example, the Institute is developing a strategy for Horizon2020 with the help of Scotland Europa). Some specific examples are:

- **SICSA:** We will develop further our collaboration with SICSA (SICSA Scottish Informatics and Computer Science Alliance), of which we are a member. SICSA is a collaboration of Scottish Universities whose goal is to develop and extend Scotland's position as a world leader in Informatics and Computer Science research and education. SICSA achieves this by working cooperatively rather than competitively, by providing mutual support and sharing facilities, by working closely with industry and government and by appointing and retaining world-class staff and research students in Scottish Universities. SICSA works closely with companies of all sizes to transfer advanced research to industry and informs researchers of current industrial problems. SICSA will continue to be funded by the Scottish Funding Council for at least the next few years through the IC "Data Lab" on big data, which we will actively participate in.
- **SSSC:** The Research Institute has recently signed a partnership with the Scottish Social Services Council (SSSC) to undertake collaborative R&D in supporting the professional social service workforce in Scotland around connected health. It is anticipated that this partnership will grow through membership of the new Scottish Funding Council/Scottish Enterprise funded Innovation Centre, the Digital Health Institute. It is also anticipated that this work will lead to national and international grants.
- **IHR/BBC:** Collaboration has been established with the Institute of Hearing Research (IHR) and BBC Scotland. With both organisations a current project assessing the possibility of different broadcast audio streams to help the hearing impaired has commenced and it is anticipated this collaboration will expand over the next few years
- **European public bodies:** The ICTE Research Centre has established over 200 European collaborations in the last few years, including a large number of European education departments and public authorities that will help inform public policy. This work will expand (2 new projects have recently been approved) and Horizon2020 and Erasmus+ will be a focus for research collaborations.
- Over the last few years, SCET has had a highly significant economic impact and we will continue to develop and expand its outreach to ensure this impact continues.

All envisaged projects will be enablers for new collaborations with industry, public sector and universities in the areas of expertise. Such projects will also provide necessary extensions to our infrastructure base for practicing "research at large". They will further offer training and help develop the local and wider ecosystems so that all stakeholders can benefit from the latest wave of technologies. The innovation opportunities will create societal and economic benefits in Scotland and, more generally, worldwide.

d. Relationship to case studies

The two case studies have emerged from the UoA's strategy to achieve excellence in research and knowledge exchange supported through collaboration and income generation.

The case study based on the economic impact produced by the Scottish Centre for Enabling Technologies (SCET) developed through collaboration with a number of commercial and public sector organisations examining the impact of offshoring on the UK IT workforce. Through this work and other national projects, the UoA received over £1m to support R&D and knowledge exchange from the Scottish Government and Scottish Enterprise. This fund, supplemented by other external income, has helped SCET to achieve the economic impact it has made.

The second case study based on the economic, societal and policy impact of ICTE Research Centre has also come about as the result of collaboration with key partners and external funding.

Impact template (REF3a)

Through research undertaken on the use of interactive technologies for online learning, latterly focussing more specifically on the use of games technology and Web2.0 technologies for education, training and organisational learning, the UoA has been able to attract funding both nationally and internationally to develop a number of innovative solutions and undertake more in-depth studies that have had economic and societal impact. We have then worked with our partners (such as European ministries of education, school inspectorates and public authorities) to impact education, public and organisational policies.