Institution: Queen's University Belfast

Unit of Assessment: 4

a. Context

Queen's is located in Northern Ireland (NI) a region plagued by political instability for over 40 years. As a result of the UK's devolved political structure, education in NI schools is a key public service that is locally controlled. Due to these important societal pressures, the School has traditionally focused its applied research on areas that directly relate to conflict resolution and educational initiatives, leading to significant national and international impact. Over the last decade, however, the School has expanded and strengthened its research profile and now organises its research into four distinct groups: i) Perception, Action, and Communication; ii) Cognition, Development, and Education; iii) Behavioural Development, Health, and Welfare and iv) Identities, Groups, and Social Change. Through these groups it has proactively developed important partnerships with key funders and research users to directly influence both policy and practice at a local and global level. These have included partnerships in Education (Department for Education – curriculum development); Health, (Health & Social Care Trusts – novel interventions for chronic illness); and Political Psychology (QPOL, a networking forum for policy-makers and academics). These areas of research strength align with the University's key research priorities of The Child; Health; and Identity and Conflict, which Queen's strategically seed-funds and supports. Queen's has also provided the ideal environment for nurturing our distinctive partnerships with industry. Since winning the Times Higher title of Entrepreneurial University of the year in 2009, Queen's has continued its quest to proactively identify and support innovative research across the University, improving the lives of people locally, nationally and internationally. In developing its innovative research, the School has been able to avail of many University services, including the Business Alliance Office and QUBIS, the university's commercialisation arm. Using these resources, the School has successfully developed collaborations with large multi-national companies, including Nestlé, to look at perinatal factors influencing food preferences, and adidas, to investigate the effects of ball graphics and ball 'flutter' on players' ability to anticipate ball heading direction. The School has disclosed an invention: a golf putting device, developed as part of a European Research Council funded project, as well as developing software for monitoring and improving balance in older adults and people with Parkinson's disease (both projects showcased at the 1st EU Innovation Convention – Brussels 2011). Further knowledge exchange examples include providing behavioural analysis expertise to Neurosolutions, a specialised electrophysiological service company; contributing research that led to a patent application for a new pet food by a local agri-food company (Devenish Nutrition Ltd); and, more recently, involvement in a new company Adoreboard (formely known as Mediasights) to develop the "Adoreboard" sentiment analysis software for marketing purposes (financially supported by QUBIS).

b. Approach to impact

Facilitating impact has become deeply embedded in the School's research culture. In this section, we describe our approach and demonstrate its fruitfulness across a wide range of domains. **Securing industrial funding**: To fund research impact activities, staff are encouraged to work directly with companies and also apply for project funding through the Knowledge Transfer Partnership (KTP). From 2008-13 the School has successfully delivered two KTP funded projects. The first was a psychopharmacology project between O'Hare's lab and Neurosolutions, Coventry. Neurosolutions benefited from O'Hare's knowledge on laboratory analysis of behavioural deterioration in neurodegenerative disorders and has since incorporated new experimental analysis of animal behaviour into its portfolio of services, making these techniques available to multinational pharmaceutical companies. The other successful KTP project involved the Animal Behaviour Centre (Wells and Hepper), which advised Devenish Nutrition Ltd. on how to test the efficacy of a novel feedstuff for dogs (see *Improving Wellbeing of Captive Animals* case study*)*. In addition to KTPs, the School encourages staff to collaborate with large multi-national companies by facilitating access to resources and technical support so that projects can be carried out as necessary. These have included a project with adidas for testing football graphics and ball trajectories which involves the use of immersive, interactive virtual reality technology in the School's Movement Innovation Lab (Craig), and a project with Nestlé (Hepper and Wells) on perinatal olfactory development and feeding behaviour. Craig was also successful in securing a Microsoft PGR Fellowship to develop movement based games for older adults using the Kinect. **Building relationships with government**: To increase the impact of research relating to the

psychology of conflict, the School created a unique Centre for Research in Political Psychology. Its recent research on public displays of political identities has informed the political debate in the Northern Ireland Assembly and Westminster Parliament and will help shape the development of regional policy on the regulation of the display of contentious flags and emblems (Stevenson). The Centre is also liaising with the Northern Ireland Office to investigate the psychology of policing (Pehrson). The School's impact in the education sector has also been substantial, with staff being encouraged to be directly involved in user groups and engage with funders who are close to policy [e.g., Council for the Curriculum Examinations and Assessment (CCEA), Department for Education NI, An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta (Irish language education)]. By developing research programmes with a particular focus on impact (funded, for example, by the ESRC's Teaching and Learning Programme), McGuinness (see *Children Learning to Think* case study) has been very successful in ensuring that high quality educational intervention research on children's thinking skills has shaped curriculum development not only in NI but further afield in Wales, England and Thailand. A novel movement intervention programme stemming from research into primary reflexes led by McPhillips has also been rolled out to hundreds of primary schools in N. Ireland, Sweden and Australia via the Primary Movement Trust and is due to become part of the curriculum of the BEd in Stranmillis University College.

Improving well-being: By developing our distinctive research group on Behavioural Development, Health and Welfare, we have also influenced policy and practice in the health sector. For example, Hepper's research into the effects of alcohol consumption on fetal development has been incorporated into NHS and RCM guidelines for expectant mothers. Having both clinical and educational professional doctorate programmes in the School offers an opportunity of exploiting the scientist-practitioner model, further extending the scope of impact. For example, in a joint initiative led by both clinical and educational psychologists, a trauma-focused Cognitive Behavioural Therapy (CBT) programme was found to significantly improve mental health and social adjustment in former child soldiers and sexually exploited girls in the Democratic Republic of Congo (Shannon). Other examples include the development of psychological interventions to promote development and adjustment in individuals with chronic illness (Dempster). By promoting dialogue with clinical practitioners and disseminating findings, interventions are now widely implemented and have a positive impact on clinical practice across NI's Health and Social Care trusts. The impact in the health sector also extends to drug discovery. A collaboration with Senexis, a company which funds preclinical research on experimental compounds, has led to the identification of a novel drug for the treatment of dementia in Alzheimer's disease (O'Hare). This drug is about to proceed to Phase 1 clinical trials.

Interdisciplinary Research: By fostering an interdisciplinary approach to its research, the School has been very successful in opening new vistas for impact. As part of the Engineering and Physical Sciences Faculty, the School is particularly well-placed to develop and nurture interdisciplinary research with both engineering and computer science. These have included a collaborative project with the School of Mechanical and Aerospace Engineering, which showed how animated work instructions for building aeroplane wing components can significantly reduce build times, yielding significant cost savings (Craig). As a direct result, Bombardier Aerospace now uses computer terminals to display animated build instructions at key points on the assembly line to accelerate assembly times of wing components. Another interdisciplinary research project has exploited the School's extensive expertise in the area of emotion and non-verbal communication (Cowie), which has helped develop and design sociable conversational avatars that use natural-looking and natural-sounding laughter (Curran). These extensive projects spanning more than 15 years have led to the development of a commercially viable company specialising in sentiment analysis, which is being used by a number of multinational companies to aid their marketing strategies (see *Connecting Emotionally with Computers* case study). This type of interdisciplinary research and subsequent impact is due to excellent support from the School's strong technical team who help overcome the practical difficulties associated with technologically laden projects.

c. Strategy and plans

As outlined above, the School has a long standing tradition of successfully translating research into high impact outcomes. The School's strategy and plans for impact are based on a coherent policy developed from an in-depth analysis of what previously led to successful impact and also what new avenues of impact are emerging from its current excellent research base. A detailed SWOT

analysis identified research strengths but also potential barriers to attaining maximum impact. The details of the new strategy are outlined under three main areas.

1. **Funding**: Our findings show that impact is more successful when supported by research programmes that engage with the users of research from the start and address a specific challenge. In the current economic climate, such programmes are also more likely to secure funding. We have initiated, and will continue to deliver, bi-annual in-house workshops and training days focused on securing funding by exploring new routes to impact. These not only raise staff awareness of the funding opportunities that can help deliver impact but encourage staff to think about impact at the very earliest stages of developing funding proposals. Staff will also be proactively encouraged to avail of different university initiatives such as the Business Alliance Fund for joint business/school studentships and seed funding to develop new business collaborations. Feeney has recently secured such funding to develop a collaboration with Grant Thornton to examine the psychology of debt.
2. **Academic duties and staff time**: While all members of staff are not expected to engage in impact, those that have clear routes to impact in their research programmes will be actively encouraged. Impact champions who have successfully translated research into impact will help mentor and support those staff who are trying to increase the impact of their research. Finding a route to impact also involves building contacts with policy makers, industrial partners and/or healthcare professionals. This is extremely time consuming and can take away from other core academic duties. To manage additional demands on staff time, the School has introduced a new workload model that acknowledges time spent exploring channels for impact. Likewise the School will ensure that targets set for staff appraisal and promotion acknowledge the importance of impact related activities. We have also modified the applications process for research sabbaticals to allow staff to request sabbatical time to promote and disseminate research findings and also engage in constructive dialogue with external stakeholders. The School will continue to offer maximum support to staff with impactful research by adopting a flexible working policy (e.g., facilitating secondments). We also recognise the importance of embedding impact in the activities of those starting out on academic careers, and have already begun providing training in the School on routes to impact for PGR students and PDRAs.
3. **Collaboration and Communication:** Much of the School's successful impact comes from staff being in a position to directly influence policy, (e.g. through QPOL, membership of Bamford Rapid Review in Mental Health, and secondments to policy bodies). Future plans include a system to extend this form of communication and collaboration to include businesses and other parts of the public sector and civil society. We kick-started this process in 2013 with a research impact showcase, held along with the BPS, for local government. We also plan to liaise directly with InvestNI to explore collaborations with local business (e.g. creative industries, NI Screen). As practical issues and barriers to implementation become more apparent, these dialogues will help researchers shape their plans for impact. The dialogue will also be extended to the general public with researchers in the School being encouraged to increase the public profile of their research by giving public lectures, showcasing their work at any relevant opportunities (e.g. DNA of Innovation lecture series, NI Assembly) and by engaging with the media. Staff have already attended workshops on how to engage with the media organised by the University's Communications Office.

d. Relationship to case studies

For the '*Children Learning to Think'* case study, McGuinness initiated dialogue on the curriculum with practice and policy groups (CCEA, DENI) when developing an ESRC funding bid. The School then facilitated a part-time secondment to a policy-making body for three years which allowed her to directly ensure that research knowledge exchange took place. Wells from the '*Improving Wellbeing of Captive Animals'* case study used KTP funding to translate some of her research findings to develop a pet-food. She was also granted a year's sabbatical so she could spend time visiting rescue shelters and zoos in Canada and the US. With the help of the Communications Office, she increased public awareness of her work through the media both nationally and internationally. The School provided extensive technical support to extend the impact of Cowie's research ('*Connecting Emotionally with Computers'* case study); the School's IT manager, Dr Sawey, helped to make the Gtrace system eligible to be included in a new World Wide Web (www) standard. In addition, the School supported Cowie's attendance at an impact event in Shanghai in May 2013.