

## **Research Environment (REF5)**

### **UoA 26: Sport and Exercise Sciences, Leisure and Tourism**

#### **a. Overview**

The Sport and Exercise Sciences Research Institute (SESRI) is one of fifteen research institutes (RIs) established in the early 2000s that comprise the institutional structure within which research is strategically delivered at Ulster. The University has submitted this Unit to 3 previous RAE's (1996, 2001 and 2008). The central importance of sport and exercise research to the University of Ulster is evidenced by the on-going recognition of the SESRI as one of the research institutes contributing to the University's Corporate Plan 2011/12 to 2015/16 that identifies the achievement of international excellence in selective areas of research as a fundamental strategic goal. The SESRI is located in the Faculty of Life and Health Sciences - the largest Faculty in the University of Ulster - comprising seven Schools, a Research Graduate School and five RIs. Research specialisms, ideas and projects are developed and nurtured across three SESRI Research Groups, each led by a senior research academic:

- The Centre for Physical Activity and Health – Category A Staff members in the submitted UOA are: Professor Murphy (Research Group Leader), Professor Davison, Professor Harris, Dr Breslin, Dr Mair, Dr McClean and Dr McNeilly.
- The Centre for Sports Science and Sports Medicine – Category A Staff members in the submitted UOA are: Professor Wallace (Research Group leader), Dr Bleakley, Dr Breslin,
- Dr McGrath and Dr Sharp. Category C member - Dr Glasgow.
- The Social Sciences of Sport Research Group - Staff members in the submitted UOA are: Dr Darby (Research Group Leader), Professor Hassan and Dr Liston.

The groups operate in an open and participatory manner, with cross-over of members among groups to facilitate collaborative research and multidisciplinary approaches to research projects.

#### **b. Research strategy**

The five-year strategy we outlined in our RAE2008 submission contained several aims, including the contribution to advancing the knowledge and understanding of the role of sport and exercise in the aetiology and amelioration of lifestyle diseases, the political, social and historical significance of sport in varied contexts, and the principles and factors that determine motor learning and biomechanics of sport. We have actively and successfully pursued each of these areas through the Research Centres and Groups outlined in the Overview section above. High quality research output was identified as a primary objective across our thematic areas with evidence of the achievement of this objective demonstrated by the quality of the outputs in this submission. Another aim was to continue to provide new knowledge and to inform policy-makers and end users in the relationships between physical activity and health, sport and social issues, and sports science/technology and performance measures. Evidence of our success across these areas is provided in the Impact document, which includes our two submitted case studies. We also aimed to enhance our postgraduate research culture, which has been achieved as indicated in section c.ii below, and to show a substantial improvement in both the sources and amounts of external funding for our research, in which we have been exceedingly successful as outlined in section d. below.

A new area for our research that has been introduced since 2008 is that of sports medicine. It was noted in previous RAEs that this was an area within the UOA that was under-represented in the submissions. The appointment of a new member of academic staff (Bleakley) and the direct involvement of another Category C member (Glasgow), both with sports medicine research backgrounds, have allowed us to successfully establish sports medicine as a strategic research area that complements the former Sports Science Research Group. Further information on sports medicine is contained in the Staffing section below. A further new emphasis since the last RAE has been in the support and development of early career researchers (ECRs) and their integration into a wider, supportive research environment. Strategies and support structures leading to the

achievement of this objective are also outlined in the Staffing below and have led to the inclusion of 5 ECRs in this submission. Another 2 ECRs are being supported in their research development for inclusion in the next REF. Their research interests are in the application of social theory to the management of change in sport organizations, particularly those providing services in sport-for-development; and research addressing the reproduction of national identities through sport for women in Ireland with an emerging focus on so-called lifestyle sports. These areas are of strategic importance to the Social Sciences of Sport Research Group.

The main objectives and activities for our research for the five years following submission are underpinned by the university's corporate plan, which has 'Focussed Research and Innovation' as one of the two corporate goals being pursued, with a commitment to 'Advancing knowledge by achieving international excellence in our chosen areas of research and to transfer knowledge in support of economic, social and cultural development.' The mission of the SESRI is to provide excellent research opportunities for staff and students by way of 3 strategic aims: (i) to advance knowledge in our chosen areas of research through the achievement of high quality research outputs and by developing further both interdisciplinary and collaborative research; (ii) to facilitate the translation of sport and exercise knowledge into intellectual assets that impact positively on the economy, society and culture, and (iii) to contribute to enriched teaching and the learning experience of our students. In support of our key aims, we developed the following strategic objectives: to develop further the culture where research, discovery, creativity and innovation are encouraged and appropriately supported; to produce high quality outputs from our chosen areas of research when assessed against international standards of excellence; to provide an optimum environment within which high quality research will be fostered, be sustainable and vibrant; to facilitate the translation of knowledge into intellectual assets that impact positively upon the economy, society and culture; to disseminate effectively the outputs and impacts of our research and innovation and communicate effectively these outcomes; to attract, train, develop and progress high quality postgraduate research students and early career research staff; and to integrate research further within curriculum design and delivery to enhance the learning experience of our students. The principal drivers that have influenced this strategy, and that will continue to shape the future direction of our research are (i) the desire to address, in novel ways, significant, on-going research problems in our core areas of physical activity and health, the social sciences of sport, and sports science and sports medicine, and (ii) the research expertise of existing staff and the recruitment of new staff to our research groups.

Several mechanisms exist at institutional, faculty and research institute level to assist in the delivery and realisation of our aims and for monitoring the attainment of targets. Membership (full or associate) of the SESRI is based on rigorous published criteria reflecting excellence in research performance (or strong potential to do so). The SESRI Directorate (the Director of SESRI - Professor Wallace and the leaders of the Research Groups - Professor Murphy and Dr Darby) guides the implementation of the strategy, and its terms of reference are to contribute to the development and articulation of the research strategy which is in line with the current Institutional Strategic Plan, to promote the research performance of the SESRI, and in particular maximise the performance of respective Research Groups in any future research assessments, to provide a focus for interdisciplinary research and innovation initiatives within and beyond the Faculty, to give particular attention to the promotion of research which results in the increased quality of research publications, to secure the required levels of external research funding, to encourage the pursuit of innovation through Academic Enterprise, to promote the publicity of successful research initiatives and innovations and seek opportunities for informing members of the public about the SESRI's research progress and plans, and contribute to the monitoring and reporting of research and innovation performance at Research Group level. Each of the 3 Research Groups (RGs) holds open and interactive meetings 3-4 times per year, and they too have their terms of reference namely, to contribute to the development and articulation of the SESRI research policy and strategy that is reflective and supportive of work conducted within the RG, to report on the research performance of the RG, particularly in relation to the quality and volume of research outputs and external research funding, to encourage synergies and plan strategically for the collaborative conduct of research projects and the delivery of collaborative outputs, to raise awareness of opportunities for interdisciplinary research within and beyond the RG, to identify and prioritise DEL studentship proposals for the RG, and to identify and prioritise Impact Case Studies for REF.

The SESRI director is a member of the Faculty's Research & Innovation Committee, chaired by an RI director, with a remit to advise the Faculty Board on all matters related to research and innovation in the Faculty. In addition to the Faculty reporting structures, the SESRI presents its progress and activities twice yearly to a committee of senior staff chaired by the Pro-Vice Chancellor for Research and Innovation. Collectively,

these approaches and management processes ensure the priority areas for the SESRI are identified, agreed and implemented.

### **c. People**

#### **i. Staffing strategy and staff development**

At institutional level, the university has put in place a number of Human Resources policies and strategies to support the delivery of its research goals. The Human Resources Organisational Development Strategy for the period 2011 to 2015 illustrates the University's recognition that its excellence is dependent on its employees. There are three strands to the Strategy: People Management; Leading and Developing Employees; and Valuing Employees (through engagement, recognition and equality). The Strategy acknowledges that the key to maintaining, enhancing and developing Ulster's excellence in research is the ability to attract, recruit, develop and retain high performing research staff. The SESRI staff strategy and development objectives following RAE2008 have adhered to these policies with huge successes in both retaining research staff and in recruiting new research staff. The SESRI benefits greatly from the regular input across all research themes by our visiting professors - Colin Boreham, Nanette Mutrie, Alan Nevill and Tom Trinick who provide academic, clinical, research methodology and sports-specific expertise to our research projects.

In this REF submission, we have 13.2 long-term Category A staff and 1 Category C member (Glasgow) - compared to 7 Category A staff and 1 Category C member submitted to RAE2008 - reflecting our achievement of growing the SESRI membership and thus their contributions to the UOA, as expressed above in our objectives following the RAE2008 review. The distribution of these staff across the research groups is given in the 'Overview' section above. All but 1 (namely Allen, a lecturer, who resigned in 2009) of the 7 Category A staff submitted in RAE2008 are included in this submission, with each of these 6 staff members having received internal promotions during the REF period (Davison, to Professor of Exercise Biochemistry and Physiology; Hassan, to Professor of Sport Policy and Management; Murphy, to Professor of Exercise and Health; Wallace, to Professor of Biomechanics and Sports Technology; Darby to Reader in Sociology of Sport; and Breslin to Senior Lecturer in Sport and Exercise Psychology). We have made 7 new appointments, including Professor Harris and four Early Career Researchers (ECR's) (Mair, McGrath, McNeilly and Sharp) that are included in this submission, whilst 2 other ECRs not included in this submission (Brooks and Kitchin) are undertaking research in preparation for future REF submissions. None of our Category A staff members is due to retire in the forthcoming 5 year period thereby providing stability and sustainability both in terms of the SESRI as a unit and the research areas of the groups. The addition of Glasgow (Cat C) to the SESRI has not only benefited the Centre for Sports Science and Sports Medicine but has further enhanced the collaborations between the SESRI and Glasgow's institution (the Sports Institute Northern Ireland). Particular strength and coherence arises from the complementarities and strong mutually supportive management structures that exist between the Ulster Sports Academy (the School for the study of Sport) and the SESRI. The former provides teaching and learning across a diverse discipline base within sport, and is the sole School to which the SESRI members belong.

The University has also put in place a comprehensive suite of Human Resources policies and practices to support the career development of our research staff. In recognition of these HR policies and practices the University has recently gained the HR Excellence in Research Award from the European Commission. The high number of promotions referred to above is evidence of both the SESRI's recommendation of these staff for promotion as well as the University's staff progression committee's acknowledgment of their value to the research goals of the University. Support and development of early career researchers (ECRs) and their integration into a wider, supportive research environment is central to our staff development policy. Each of our ECR's has undertaken the Online Welcome & Orientation Programme and 4 online Mandatory Training Programmes during their probation period. In addition, our ECR's have undertaken a local induction co-ordinated by the Head of School and the SESRI director with the aim of welcoming and introducing the researcher to their colleagues, assigning a senior research mentor, and ensuring s/he has the required information and resources to be effective in their new role. Support and Development for our researchers is also provided via the University's Researcher CPD Framework which incorporates all the domains and sub-domains of VITAE UK's Researcher Development Framework. Ulster's Researcher CPD Framework aligns the support and development options available within the University against each of the respective sub-domains of VITAE UK's Researcher Development Framework. A menu of Career Advice and Development Options provided by Student Marketing & Employability is included within Ulster's Researcher CPD Framework

to further inform ECR research staff and students. Following a consultation process across the Ulster Sports Academy, the SESRI articulated a clear ECR strategy to enable staff members to become research active, whilst each of our ECRs agrees a Personal Development Plan with the HOS and the SESRI director via a Developmental Appraisal Review at the start of their probation period. This plan is subsequently reviewed on an annual basis to ensure a mutual understanding of performance objectives and to agree the required support and development to achieve these outcomes.

Research Governance across the SESRI is meticulously administered via a number of mechanisms by which standards of research quality and integrity are maintained (for example ethics procedures and authorship policies). Standards of research quality and integrity are set by the University's Code of Practice for Professional Integrity in the Conduct of Research, which covers research in all disciplines and is underpinned by a series of policies and procedures relating to the ethical review of research involving human participants and the governance of areas which are subject to specific regulation, including human tissue, radiation, and vulnerable populations. These were first formally established in 2005 and are kept under review by the University's Research Governance section and associated committees (of which the SESRI director is a member) and working groups, to ensure that they reflect developments such as the publication of the Universities UK Concordat to Support Research Integrity. It is University policy that all research involving human participants must be reviewed through the filter and ethics committee process (our UOA has its own filter committee), as appropriate. In addition, specific mandatory training is provided for the SESRI staff and students in research integrity, the requirements of the human tissue act, accessing the NHS and good clinical practice. Guidance is also available on authorship, assessing risk, obtaining consent and related matters. Research students and newly-appointed staff are introduced to the requirements of the Code of Practice during their University induction. The Research Governance section carries out annual reviews of selected studies to ensure that they are in compliance with procedures and appropriate legislation, and quarterly reminders are issued to all staff to remind them of the need to comply with procedures and standards and of the expectation that they will contribute to maintaining a culture of quality and integrity in research in all disciplines. Strict guidelines are also in place to ensure authorship integrity is maintained and a 'Research Study Volunteer Complaints Procedure' is made explicit in all research proposals.

The university has rigorously implemented the Concordat to Support the Career Development of Researchers. Since 1998, when the Research Careers Initiative (RCI) was launched, the SESRI has adhered to the University's mechanisms designed to effectively implement all aspects of Institutional Contract Research Staff (CRS) policy. To illustrate the effectiveness of such mechanisms, in January 2013 the University gained the HR Excellence in Research Award from the European Commission. This award demonstrates Ulster's commitment to improving working conditions and career development opportunities for research staff. The University looks forward to continuing to illustrate its commitment to career development needs of CRS and is already working to ensure that this prestigious award is retained in 2015 when reassessment takes place. The SESRI adheres to the University's policy to provide equality of opportunity to all and has endorsed the Code of Practice on the selection of staff for the REF 2014 submission and the principle that staff eligible for return are not excluded for reasons related to a protected characteristic or for a non-traditional career pattern. Staff in this UOA involved in selection decisions have undertaken equality and diversity training in relation to REF 2014 and an Equality Impact Assessment was carried out on the final selection of staff. The University is also a member of the Athena SWAN Charter, and equality screening on the Code of Practice and regular equality analysis of staff follows each RAE/REF review.

University central funding to support the research activities of the staff in the SESRI is provided via the Research Institute Budget Allocation. The method for allocation of Research Institute budgets by the Research Office is regularly discussed at annual RI Directors Away Days and consequently evolves from year to year. The current methodology involves a combination of QR earned and rewards for research grant activity. The major part of the annual budget allocation is based on the in-year QR income for the research area plus an allocation based on overhead recovery on grants for the previous 3 years. This annual budget is allocated by the SESRI director to the SESRI members on the basis of applications to support and develop their research, including staff development, participation in conferences, realisation of impact, and purchase of equipment and consumables.

## **ii. Research students**

Postgraduate research students play a key part in the research culture and environment of the SESRI by way of their focussed research projects, their involvement in all SESRI research events, and their engagement with their fellow students both formally and informally. A strategy has also been implemented whereby studentships are awarded across the 3 research groups thereby providing sustainability and balance in our postgraduate student cohort. During the REF assessment period there has been an equal distribution of students across the 3 research groups. Eighty per cent of the students were/are full-time, with 16 students receiving competitive prestigious RCUK awards, of which 3 were supported by an additional Cooperative Award in Science and Technology. One full-time student was funded by the Wide Area Research Training in Health Engineering - Early Stage Training, FP6 programme. Two of the students in Table 1 are scheduled for their oral examinations in November 2013 while a further 5 students are expected to submit their theses for examination by February 2014.

Research students are recruited, given access to appropriate training and monitored by the SESRI's postgraduate tutor (Darby) in conjunction with the Faculty Research Graduate School (RGS). The university has recently piloted the Doctoral Innovation Programme (DIP) which provides a comprehensive range of professional development programmes i.e. transferable professional skills and some research techniques for all doctoral students. Doctoral Students have the option of pursuing both Project Management Accreditation (ILM Level 5 Unit) and Associate Membership of the Higher Education Academy via the First Steps to Teaching in HE Programme as part of the DIP. The SESRI provides training in discipline specific research techniques and research management either via workshops and/or tutorials and promotes and supports cross- collaboration with other faculty initiatives such as joint PhD supervision. Part of the DIP includes a review of the professional support and development for Research Supervisors. All of the SESRI members are engaged in PGR student supervision, with each student having a minimum of two supervisors with at least one being a SESRI member who has successfully supervised to completion. The RGS ensures that students receive training in relevant research methods and generic skills, and it organises the progress seminars during the first year of study, the confirmation seminar for doctoral research, and regular progress thereafter.

The RGS provides a support grant of £1,000 per annum to each RCUK student which in conjunction with the SESRI funds enables data collection or field work and participation in conferences and seminars. In addition, financial support is available from external grants awarded to staff which included funds to support the laboratory work of their students. The SESRI has excellent postgraduate facilities. All full-time students are provided with a designated individual workspace in one of two PGR student open space offices that were refurbished in 2009 and which are located adjacent to the laboratories. Part-time students have access to bookable shared workstations in the offices. As well as bookable access to our research laboratories, our research staff and students have the technical support of 2 full-time lab technicians.

## **d. Income, infrastructure and facilities**

An increase in external funding and in both the range and prestige of funding sources formed a key cornerstone of our strategy over the REF assessment period. To assist in the delivery of this objective, we appointed a Sponsored Research/Consultancy Officer (Ferguson) in 2009, with the key role of securing grants, awards, consultancy contracts, and sponsored research projects in the field of sport, exercise and leisure. Working closely with colleagues in the Research Office who provide updates on external funding opportunities, Ferguson identifies funding opportunities that match the research interests of the SESRI members. A process for the internal peer-review of all research funding proposals prior to their submission to funding agencies was established and further meaningful collaborations and partnerships (internal, local, national and international) were pursued. As a result, the SESRI has been extremely successful in terms of external funding, with grant income in excess of £3.13 million during the REF period. These awards include competitive funding from BIS Research Councils (£850K), non-EU based charities (£109.5K) and UK-based charities (£21K). Other sources include UK government and local authorities (£1.9 million), UK industry (£55k), EU government bodies (£42K), and a range of other awarding bodies (£68K). Examples of cross-faculty awards include the ESRC grants of £319K and £47.5K that involved the SESRI and colleagues from the Engineering RI and the Computing and Mathematics RI, and Murphy's PRTL – Cycle 5 project with Engineering (£19K). Examples of awards with external partners include Darby's collaboration with colleagues at Northeastern University that led to ESRC funding (£68.5K), and the InterReg IVb award (£204K) that involves the SESRI with researchers from Sheffield Hallam, TU Delft, TU Eindhoven and Howest University along with internal colleagues in the Engineering RI

and the Computing and Mathematics RI. Other grants involving Hassan and colleagues from our faculty in the Institute of Nursing and Health Sciences include those awarded by Special Olympics International (£124.7K). Examples of high quality outputs arising from these grants include the *Med Sci Sports and Exerc* (2012;44,10) and *Sports Biomech* (2012;11,2) papers submitted by Wallace and colleagues, papers in *Cardiovasc Diabetol.* (2011;7,10) and *Med Sci Sports and Exerc* (2013;45,8) by Davison, McClean and colleagues, a paper accepted for publication in the *Hamden Medical Journal* (Davison), the *Geoforum* (2013;50) article submitted for publication as well as those published in *The Brown Journal of World Affairs* (2012;18,2), *African Historical Review* (2010;42,1), and *Afrique Contemporaine* (2010;233,1) (Darby). Working closely with the University of Ulster's Office of Innovation, which aims to develop innovation in its broadest sense to the benefit of the University and the wider Region, members of the SESRI have also been successful in securing some £70k in research and consultancy projects through InvestNI 'Innovation Vouchers' and other consultancy projects with local companies.

In terms of Research Infrastructure and Facilities, the SESRI was awarded a UK government grant of £1.207 million in 2010. This investment has resulted in the provision of world-class Exercise Physiology, Biochemistry, Biomechanics and Motor Learning laboratories and the purchase of highly specialised equipment including an EPR spectrometer, DNA microarray analyser, DXA scanner, endothelial function analyser, 5 large Kistler force plates (permanently installed in 2 areas – biomechanics lab and the indoor running track), a 12-camera Qualysis motion capture system, 4 CODA CX scanners and a Mobil-Eye GT-ME Eyetracker. The future development of research infrastructure for the SESRI is guaranteed by the provision of matched laboratory facilities in the University's £250 million Belfast campus development scheduled for completion in 2018.

#### **e. Collaboration and contribution to the discipline or research base**

All members of the SESRI are actively encouraged and supported - via external grants, the SESRI research strategy budget, the Ulster Sports Academy, and the central university research strategy budget - to contribute to the enrichment and development of the research base in sport and exercise sciences. The SESRI members and postgraduate students regularly participate in international, national and regional discipline-specific and multi-disciplinary conferences and workshops as keynote and invited speakers as well as through oral and poster presentations. The SESRI has also hosted international and national events, for example the Sport, Race and Ethnicity Conference (2012), the Biomechanics Interest Group meeting (2012) and the Sports History Ireland Conference (2013). Furthermore, supported by Sport NI, the SESRI delivered 3-4 research seminars each year over the duration of the REF period where internationally acclaimed researchers presented their research to wide-ranging audiences including academics, policy makers and end users in Northern Ireland.

Examples of individual collaborations with international and national centres of excellence include those by Bleakley with Queensland University of Technology, the Institut National du Sport, de l'Expertise et de la Performance (INSEP), Trinity College Dublin, and Brigham Young University, in the co-authorship of the Cochrane review. Other collaborations include those at Georgia Regents University (Harris, Davison and McClean); August Pi i Sunyer Biomedical Research Institute, Barcelona (Davison and McClean); High Point College in North Carolina (Bleakley) and University College Dublin (Bleakley and McGrath); University of Nebraska and the Technology Research for Independent Living Centre, Dublin (McGrath); the University of Wolverhampton and the University of Strathclyde (Murphy); the University of Otago, Virginia Commonwealth University, US and the University of Birmingham (Sharp); the Instituto Superior da Maia, Portugal (Liston); Northeastern University, Boston (Darby); Griffith University and University of Technology, Australia (Hassan); and Loughborough University and Edinburgh Napier University (Wallace). These partnerships have led to number of joint initiatives, including research projects, funding applications, research publications and research student supervision. The collaboration by Davison with colleagues at Curtin University, Australia, University College Dublin, Ireland, Mayo Clinic, U.S.A. and the National University of Ireland, Galway, have also led to a number of research publications, whilst Wallace's collaboration with the R&A Rules Ltd led to 3 prestigious DEL/ CAST PhD studentship awards and joint publications and his association with the Sports Technology Institute at Loughborough University has entailed joint postgraduate research student supervision and publications.

The SESRI members make significant contributions to professional and learned societies through their provision of their research expertise to the setting of guidelines and strategic objectives, programme

evaluations and education of members. Examples include: membership of an expert scientific advisory group for the Department of Health; a BASES expert panel; and WHO European work groups in setting physical activity guidelines (Murphy); education and research officer for the Association of Chartered Physiotherapists in Sports Medicine, UK; member of the teaching faculty of the Royal College of Surgeons and Cardiff University; membership of the International Ankle Consortium; and as the lead researcher and guarantor for UK Clinical Guidelines for Acute Soft Tissue Injury Management (Bleakley); and the European Platform for Sports Innovation (Wallace). Other discipline-based memberships include the American College of Sports Medicine (Fellows – Davison, Murphy and Harris; member McClean), BASES (Fellow – Murphy; members McGrath, Davison, Sharp and Wallace), the North American Society for the Psychology of Sport and Physical Activity, and the Northern Ireland British Psychological Society (and its division of health psychology) (Breslin); the Clinical Exercise Physiology Association (Harris); the Association for Nutrition, and the Nutrition Society and Sport and Exercise Nutrition Register (McNeilly); the European Federation of Adapted Physical Activity and the North American Society for the Sociology of Sport (Hassan); and the International Society for Biomechanics in Sports, the International Sports Engineering Association, and the European College of Sports Sciences (Wallace). The SESRI members also contribute to the quality of research outputs in the disciplines by way of editorial and reviewer roles across the sport and exercise sciences. Examples include: Editorial Board, Soccer and Society; Advisory Board, Impumelelo: The Interdisciplinary Electronic Journal of African Sport; Guest Editor, African Historical Review; and Guest Editor, Sport in Society, (Darby); Nutrition and Biochemistry Section Editor, Journal of Sports Sciences; Editorial Board, World Journal of Diabetes; and Editorial Board, ISRN Nutrition (Davison); former Editor, Sport in Society, Editorial Board, Soccer and Society (Hassan); Biomechanics Section Editor, Journal of Sports Sciences; Editorial Board, Journal of Sports Engineering and Technology; Editorial Board, Sports Engineering Journal (Wallace); and Chief Editor, Human Figurations: Long- Term Perspectives on the Human Condition (Liston).