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Institution: University of Hull

Unit of Assessment: C26: Sport and Exercise Science, Leisure and Tourism

a. Context

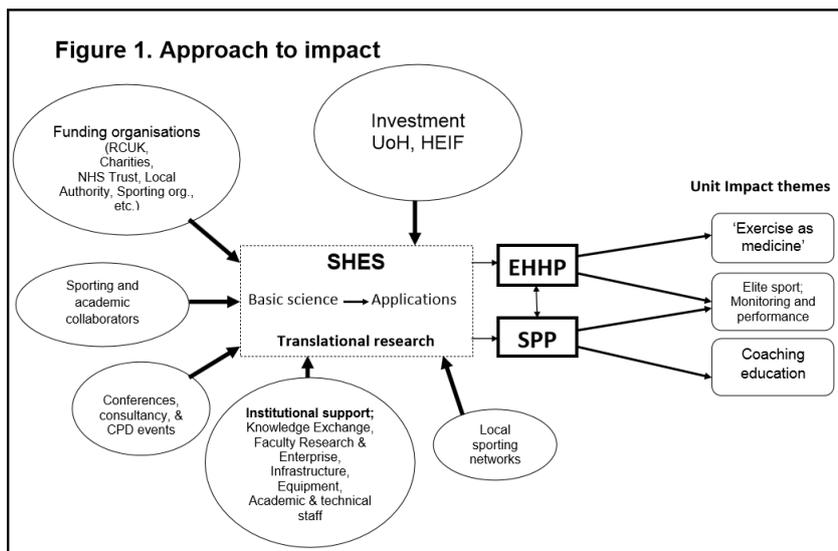
Following RAE 2008, and in keeping with the University’s strategic plan, the Department of Sport, Health and Exercise Science (SHES) realigned research interests and expertise into two research groups, ‘Exercise, Health and Human Performance’ (EHHP) and ‘Sport, Pedagogy, and Practice’ (SPP). This decision has been supported with new appointments of research-active staff to the core themes and appropriate investment (circa £3.5 million) in research infrastructure and laboratory equipment.

Figure 1 summarises the research investment and impact for the two themed areas of research within UoA26 at the University of Hull. The main beneficiaries from the applied research undertaken have been; Local Authority and National Health Service units responsible for community and outpatient exercise/rehabilitation service delivery; professional sporting organisations and a number of non-academic user groups engaged in the employment, training, and in the deployment of coaches in both community and elite-level sport settings.

The EHHP research group work increasingly focuses on physical activity, exercise and health - supporting the exercise-related, health and well-being needs of communities, especially patients with chronic disease. Within the sporting arena, the application of sports technology to enhance elite athlete performance/ learning has featured prominently - with commissioned work for both regional (including, Hull Kingston Rovers Rugby League, Hull City Football Club, Liverpool Football Club), national (England Netball, England Ice-hockey, and England Bobsleigh) and impact on international sporting organisations (Prozone Sports Limited). SPP research has underpinned work with national (Netball England, England Rugby Union, Rugby Football League, Welsh Rugby Union) and international organisations (Canadian Athletics Coaching Centre, Gaelic Athletics Association, High Performance Sport New Zealand and New Zealand Rugby League) contributing to the professional preparation, on-going learning/curriculum development, pedagogical practices and experiences of both coaches and coach educators.

b. Approach to impact

Research that draws on basic and applied sport science in a translational way to improve health and well-being, human performance and coaching practice underpins the approach to impact for UoA26 at Hull (Figure 1).



This complex process requires multiple levels of interaction and is coordinated at departmental level through regular monthly departmental research meetings, formal interaction with the Faculty research and enterprise initiatives and close liaison with key stakeholders. To extend the impact of our research we:

- Work collaboratively with academic clinicians, NHS service delivery units, professional bodies and world-leading scientific teams, both within and external to the university, to

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develop cross-cutting interdisciplinary research approaches to health and well-being.

- Work in partnership with sporting clubs/organisations and coach educators at regional, national and international levels to inform policy and practice within coaching and coach education settings.

Working with world-renowned teams within the University of Hull (Academic Units of Cardiology and Vascular Surgery, Centre for Medical Engineering) and externally in Leeds, Sheffield, Manchester and London, we are able to direct our efforts to relevant clinical priorities and contribute to development of evidence-based practice and patient benefit. The work of EHHP staff involves implementation of research and good practice in clinical units responsible for supporting the health-related exercise and rehabilitation of patients with chronic disorders (including community-based projects, such as 'Heartwatch' cardiac rehabilitation, Leeds Leisure Services; 'Livewell', adult obesity management, East Riding Leisure Services). Findings from clinical trial collaborations of exercise intervention within tertiary care local hospital settings (for example, Transtibial Amputees within Hull & East Yorkshire NHS Hospital Trust) to multi-centre European investigations have already impacted on professional practice and guideline development. Such collaborations allow us extend the remit of our enquiry - ranging from the incorporation of sophisticated laboratory techniques (such as within the EU Heartcycle Guided Exercise RCT Study) to the analysis of large representative epidemiological databases for mortality outcomes (English and Scottish Health Surveys). Impact is achieved by staff contributing to academic partnerships/working groups and professional associations and networks. Published research outputs and invited presentations have been incorporated into policy and guideline formulation (including European and US Scientific and clinical practice or scientific evidence statements). These approaches are beneficial as means of solidifying and further advancing applied practice and the impact of projects. Similarly, SPP collaboration with national organisations has entailed the provision of research-based workshops to coach educators and coaches and consultancy in the design and delivery of coaching programmes. Such engagements are a feature of several of our collaborations (for example, Gaelic Athletics Association, Professional Golf Association and Rugby Football League). Interdisciplinary work in elite sport (integrating both EHHP and SPP groups) has involved academic project management, equipment investment, integration of PGR students, including full-time 'intern' studentships located within sporting organisations (Hull Kingston Rovers Rugby League, Hull City Football Club) and staff secondments. This work utilising technology for individualised monitoring and performance analysis in elite football/ rugby league settings has resulted in wider software development for international commercial impact (Prozone Sports Limited).

Departmental support for staff engagement in networking events, conferences and consultancy has been central to the development of a range of national and international collaborative links. At a local level, we undertake regular meetings with non-academic user groups, including NHS clinician and multidisciplinary support staff, leisure service and coach education managers, professional sport team coaches and support staff.

At a practical level, these links are embedded in the in-house peer review process for all externally submitted research and studentship proposals, which require evidence of relevant external collaboration/investment and internal support which will ensure non-academic impact. To achieve this approach, SHES addresses staff workloads (and resources) to meet specific project and projected work needs. Memorandums of understanding (MoU) are also utilised to develop and enhance the potential impact of our research. To date, agreements have been completed with regional (Hull City Council, East Ridings of Yorkshire Council, City Healthcare Partnership, Hull) and international sporting organisations (New Zealand Rugby League).

c. Strategy and plans

In keeping with the University's strategic plan, the development of inter-disciplinary translational research projects on the 'Health and Well-being' theme is now the focal point of the Units strategy to progress the impact of its research. We have selected specific directions for our research, focusing on emerging areas of strength and integrating new staff expertise. These will allow us to maximise our impact within the sport and exercise sciences. The main thematic areas are detailed below:

- Developing the "exercise as medicine" theme, through the application of clinical sport and

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exercise sciences, including psychological, biomechanical and bio-molecular research to community-based and NHS interventions to improve patient health and well-being.

- Improving sports performance, particularly through the application of research incorporating technological advances (including player tracking, Global Positioning Systems, video performance analysis, micro-physiological monitoring and mobile applications) to optimise the individualisation of sports monitoring/training and improve tactical/technical learning in team sports.
- To improve the quality of sports coaching and coach education, especially at elite level, through the application of socio-pedagogical and psychological research findings.

EHHP has established strong internal collaborative relationships (especially with academic units of Cardiology and Vascular Surgery, the Centre's for Cardiometabolic Research, Hull York Medical School [HYMS] and Medical Engineering) – integrating these links with regional NHS service delivery centres for patient benefit. Innovative research projects (some outlined above) and service delivery partnerships are underway (for example, cardiac rehabilitation with the City Heath Care Partnership, Hull; exercise tele-monitoring with the Centre for Telehealth). Further, SHES has a strong strategic research partnership with the Humber Obesity Nutrition Education and Innovation (HONEI) Project, HYMS, which will develop commercial aspects of obesity and metabolic health management.

Within the context of performance and community sport, the Unit will continue to develop and expand engagement with regional partners. Impact will derive from the ongoing performance monitoring of numerous elite sports teams (listed in context section) and continuing professional development (CPD) opportunities for community coaches, coach educators, and those who manage, employ, and deploy community coaches. Also, staff will progress existing relationships with national and international organisations (Canadian Athletics Coaching Centre, High Performance Sport New Zealand, New Zealand Rugby League) in relation to the pedagogical principles and philosophies that underpin curriculum design, learning strategies and assessment modes utilised in coach education provision.

d. Relationship to case studies

The submitted case studies demonstrate that support for applied research has led directly to the implementation of evidence-based prosthetic rehabilitation for transtibial amputees and sporting benefits in terms of improved stress management/psychological coping among elite professional athletes and improved coach education practices. **Case study 1** exemplifies the strong collaborative, interdisciplinary research undertaken at the University of Hull, focused on the early rehabilitation of amputees and their risk of falling. The research projects were undertaken with colleagues in Academic Vascular Surgery, HYMS and clinicians from regional NHS rehabilitation service delivery centres, supported by competitive grant funding. Dissemination to professional organisations, has influenced practice nationally and internationally by prompting clinicians to utilise evidence-based recommendations for muscle strengthening and balance in prosthetic rehabilitation. Research outputs have additionally informed policy at national levels. The findings of the *HEART* study, the first RCT comparing the biomechanics of different early walking aids will have longer-term impact on clinical practise and healthcare economics. **Case Study 2** illustrates how the research conducted by the SPP group that addressed the social-pedagogical and psychological complexities of elite level coaching practice has directly informed the preparation and education of coaches, nationally and internationally. In this respect, the findings from the group's contemporary approach to both qualitative and quantitative research are assisting coach educators, as well as coaching practitioners, to better understand and reflect upon the complex, multi-layered, cultural and contextual challenges in elite sport. Research inquiry has been translated to the CPD of elite sports coaches; utilised to underpin curricula within coach education programmes/pedagogical practices, and assist with stress management and effective coping behaviour in developmental and elite sporting settings.

The impact case study examples serve to demonstrate a strong embedded culture of delivering impact in UoA26 at the University of Hull. The department therefore now regularly reviews its strategy with respect to impact in order to effectively address the research process from proposal through delivery and translation to application in sport, health and exercise contexts.