

Environment template (REF5)

<p>Institution: University of Lincoln</p>
<p>Unit of Assessment: 26 – Sport and Exercise Science, Leisure and Tourism</p>
<p>a. Overview</p> <p>This UoA covers the research of the School of Sport and Exercise Science, which sits within the College of Social Science. The School was formed in 2006, and, more recently, as part of the strategic investment in research by the University, a new professor (Mullineaux) and reader (Allen-Collinson) were appointed to bring research experience and leadership. The developing research strengths, strategy, culture and productivity, have led to this first REF submission. The School's research work is organised into two overarching inter-disciplinary groups:</p> <ul style="list-style-type: none"> • Psychophysiology and Biofeedback in Sporting Performance (PBSP); • Sociocultural and Psychological Aspects of Sport and Physical Activity (SPASPA). <p>The PBSP group is challenged with understanding the origins and control of the tiny differences that determine success in sport, while the SPASPA group focuses on understanding the context that influences physical activity participation. These groups provide a key foundation for the research strategy, and subsequently resource allocation, developments in staffing, facility expansion, equipment purchases, and priority planning, that are all targeted towards the goals of these groups. Whilst members of staff are involved mainly with one group, there is inter-group membership to recognise and facilitate inter-disciplinary research collaborations. Experienced research staff within each group aid the development of new researchers through both formal and informal mentoring arrangements. The research strategy provides a clear vision and structure, and this REF submission reflects the research development and ambition of the School.</p>
<p>b. Research strategy</p> <p>Reflecting the University's research strategy and development path, the goal of the School's research strategy is to become internationally recognised for research of importance to Sport and Exercise Science in the key areas of:</p> <ul style="list-style-type: none"> • Psychophysiology and Biofeedback in Sporting Performance (PBSP; led by Mullineaux); • Sociocultural and Psychological Aspects of Sport and Physical Activity (SPASPA; led by Allen-Collinson). <p>The strategy involves:</p> <ul style="list-style-type: none"> • using investment by the University to appointing research leaders to form and drive the research direction of the School; • creating and developing strengths in key research themes that reflect areas of importance for research, and provide the opportunity for the School to develop an international standing; • implementing a resourcing policy whereby all existing and future staffing, equipment and other resources are aligned with one or both groups. Included within this policy are mechanisms and funding to enhance existing resources through, for example, staff training, staff recruitment and purchases of new technology and equipment; • providing a framework for staff mentoring to develop fully each individual's research capability and expertise. For example, all staff belong to a research group, which both research-experienced and -inexperienced staff have found supportive, motivating and effective in enhancing their capabilities; • working collaboratively, within and outside the School, to increase the number and raise the quality of research publications, outputs, grant submissions and impacts; • using inter-theme collaboration, within the School, across the University, and with national and international networks, to stimulate and generate inter-disciplinary research. <p>Key developments</p> <p>The research strategy has led to the following achievements during the REF period:</p> <ol style="list-style-type: none"> further development and embedding of research across the School, resulting in this first submission to the REF; appointment of senior researchers to provide complementary leadership in forming and driving the strategic research direction of the School, with Mullineaux appointed as the first Professor of Sport Science in 2011, and Allen-Collinson as Reader in the Sociology of Sport in 2012; appointment of 5 additional staff, four of whom (in bold) are submitted to the REF (AEvans 2009, Crust 2009, Olympiou 2010, Gee 2012, Swann 2012), to expand the number and proportion of research-active staff and to create a critical mass of quality researchers;

Environment template (REF5)

- iv. initiation and enhancement of the School's doctoral research programme. Commencing in 2008, the first doctorate was awarded in 2012. This programme also constitutes part of the staff development programme, either to provide an avenue to obtain supervisory experience at this level, or to register as a doctoral student. The doctoral programme has contributed to enhancing the research culture through a developing critical mass of research students; currently there are 8 (6 FTE) students registered;
- v. securing funding for full-time doctoral students. The University has supported the School by providing funding for 2 full-time doctoral students, one in 2009 (Swann; graduated 2012), and one in 2013 (Gorman). This funding is set to continue into the next REF cycle, and a further full-time student began in September 2013 (Stamp);
- vi. establishment of an MSc by Research programme, launched in 2009. This was designed to: enhance the research student culture; to cater for a specific market; lead to more PhD students; and to assist in staff development by providing experience of research degree supervision at Master's level prior to supervising at doctoral level;
- vii. development of a strategy to create impact. A good foundation existed for this, and building upon this, extant strong partnerships with external bodies for consultancy work have been modified to complete research with clear and more immediate impacts;
- viii. raising external income generation through initiating external grant submissions, developing a strong reputation for research within the specialist areas of each research group, and using internal peer-review to enhance grant submissions.

This strategy has provided a strong foundation on which to enhance the research culture, and has resulted in enhanced enthusiasm for and commitment to research across the staff base. As research developed, and for the purpose of addressing the needs of specific client groups, it was strategically focussed into five sub themes within the two overarching groups. These thematic groups undertake research (fundamental, applied and knowledge exchange) addressing issues of international, national and regional significance. Given that key strengths span disciplines and subject areas, the theme groups have some overlapping membership (although not indicated below), and pursue the following key aims (staff submitted to the REF are in bold, with theme leaders listed first):

- Biofeedback in Sport (**BIO**; **Mullineaux**, Bishop, Willmott). Focus: to understand and apply the mechanisms of action of biofeedback to improving sporting performance;
- Health Advancement Research Team (**HART**; **Allen-Collinson**, **AEvans**, Henderson, Middleton). Focus: to explore, analyse and enhance understanding of the role of embodiment in a range of health- and body-related issues and domains;
- Mental Toughness (**MTOUGH**; **Crust**, Olympiou, **Swann**). Focus: to apply knowledge of the mechanisms that underpin mental toughness in sport and exercise, and other performance settings, such as education;
- Psychophysiology of Exercise and Sport Performance (**PESP**; **Smith**, Baker, **Gee**). Focus: to understand and apply the inter-disciplinary area of psychophysiology to the study of human performance;
- Youth Sport Research (**YSR**; D Evans, Thomas). Focus: to analyse and influence factors affecting participation and benefits of children's play and physical activity in schools. This is a theme that has only recently emerged, and no staff from this area are submitted to this REF.

As part of the inter-disciplinary research culture, each theme comprises external members, from across the University, businesses, third-sector and international colleagues. For example, HART includes two Australian researchers and a Professor in Primary Care/practising GP (who is submitted in the Allied Health Unit of Assessment).

Progress and future objectives

The implementation of the School's research strategy has led to a steady increase in the quantity and quality of research publications, and an increase in the number of staff with a PhD or equivalent. The priority areas for the next five years are to: further increase the quantity and quality of publications across the staff base, increase the amount of external income received, create greater impact from our research, grow the number of doctoral students to a sustainable maximum, and increase the pool of experienced doctoral supervisors. The objectives are to:

- i. further increase the number of research active staff producing high quality, including world leading and international standard, outputs;

Environment template (REF5)

- ii. increase external research income obtained, via the submission of high quality applications with a greater focus on funding for fundamental research, including to research councils and other high quality funders;
- iii. increase the number and sources of funding awards for full-time doctoral students, and increase the number of doctoral degrees awarded;
- iv. further develop our international collaborative links leading to tangible outputs. There has already been a steady increase in outputs, including external grant submissions and journal paper publications, with international collaborators (see section e);
- v. make optimal use of University and College support for research, including training and development activities delivered by professional service teams and academic colleagues across the University, attendance at networking events (such as College research away days), and the services provided by the College Research Officer and Business Development Managers for the development of research and income generation proposals;
- vi. continue to strengthen impact through implementation of the University's and School's research and impact strategies, which promote an impact-focussed culture among staff through training and sharing of experience and good practice, and through engaging with a wide range of users and policy-makers;
- vii. to support all staff currently without a doctorate to obtain a PhD or equivalent qualification (60% of staff have a doctorate currently). This is a major focus of the staffing strategy, and our professional development programme. We will maintain our policy of appointing new staff with a PhD;
- viii. invest in additional state-of-the-art facilities and resources that contribute to developing the research capacity of the research groups and assist in attracting new research-active staff and doctoral students.

c. People, including:

i. Staffing strategy and staff development

Key elements of the strategy

Since 2008 the School has been expanding, with good retention of staff. This growth has greatly facilitated the enhancement of the existing research strengths. To meet the strategic focus of the School's research endeavour, our staffing policy is based on the position that new staff must be able to contribute specifically to one of the two research groups and five themes.

For current staff, three principal policies are now in place within the School. First, mechanisms are in place to provide targeted support for research, such as lighter teaching and administrative roles, funding for specialist equipment, professional development opportunities, and associating a Graduate Teaching Assistant/doctoral student with a member of staff to supervise. Second, targeted support is provided for Early Career Researchers and those becoming research active, such as additional research days included in the workload allocation process. Third, all staff are supported in professional development activities. Support includes providing funding to attend training courses or academic conferences, regularly engaging with mentors or appraisers to assess needs, and empowering mentors with an avenue to facilitate action of needs identified. For staff studying for a PhD this support is primarily focused initially on enabling them to obtain a PhD, and as a minimum includes the allocation of one day per week for PhD study. Funding has been secured for research leave to commence in the School in the future, in line with the College strategy.

Wider mechanisms supporting the strategy

The School is supported by the University's People Strategy, a comprehensive range of policies around employment, equal opportunities, research management and ethics, each with an element designed to facilitate and support research activity among staff and students. The University adheres to the principles of the Concordat to Support the Career Development of Researchers, which is framed through the Continuing Professional and Personal Development Framework. This framework highlights key elements for staff to work towards for staff development, many of which are reflected in the strategy throughout this section.

Leadership staff appointments

The appointment of the first Professor in Sports Science (Mullineaux), in 2011, as part of the broader staffing strategy, was a significant step in the mission to establish the University as an

Environment template (REF5)

internationally recognised centre of Sport and Exercise Science research, and contributed to the further development of the School's research strategy, as described in section b. Similarly, the appointment of Allen-Collinson as Reader in the Sociology of Sport in 2012 (Allen-Collinson) was designed to bring research leadership in the socio-cultural aspects of sport. The staffing policy has also been designed to develop a critical mass of researchers within each of the 5 research themes.

Mullineaux directs the PBSP group and BIO research theme, while Allen-Collinson directs the SPASPA group and HART theme, and both contribute to the School's overall research culture by bringing to bear extensive experience of international and national journal publishing, successful grant applications, and doctoral supervision. Furthermore, the complementary experience and expertise of the Professor in quantitative, and the Reader in qualitative, research approaches are available to members of staff who span the continuum of research methodologies and methods in sport and exercise science (and these have been further supplemented by the appointment of specialists in a range of methodological approaches across the College). This breadth of leadership also contributes to the inter-disciplinary strengths of the School's research.

New staff and Early Career Researchers (ECR)

In developing a critical mass of researchers across the research themes, five additional new staff were appointed during the census period. Three of these were ECRs assigned to the following themes: HART (AEvans in 2010), PESP (Gee in 2012) and MTOUGH (Swann in 2013). All new staff are supported in a similar manner via a structured system of mentoring and peer support, with regular meetings to identify and action needs, and to ensure maximum use is made of individual and group training opportunities. All staff contribute actively to both the School's and the wider University's research seminars and cognate activities. Similarly, all staff, including ECRs, are involved in the supervisory process, through the MSc by Research and doctorates, including working with an experienced supervisor. Lighter teaching loads with minimal administrative duties ensure that as a minimum 20% of staff time is set aside for research. For example, an ECR appointed in 2010 (AEvans) received two research days per week to conduct research and complete his PhD, which was achieved in 2012.

To ensure overall workloads permit greater focus on research, time efficiency mechanisms have been initiated for all research-active staff in the School. These include alternating light and heavy semester teaching loads, lighter administrative loads for staff with the capability for and interest in pursuing research, and initiating study-leave awards to begin in 2014. To assist ECRs in engaging in research that leads to collaboration, journal publications and larger grant submissions, there are bi-annual pump-priming grant competitions within the College of Social Science that particularly support inter-disciplinary research. Staff have been successful in gaining support for ten projects since the scheme began in 2009, and these have resulted in high quality research outputs.

Professional development

In accordance with our research and staffing strategy, and external guidelines, including the Concordat to Support the Career Development of Researchers, all eligible staff are strongly encouraged and supported in their doctoral studies. This includes provision of funds to pay for tuition fees and research expenses, and establishing 'time-saving' mechanisms, which include an allocated day-per-week for doctoral studies in addition to other research time. In 2008, of the 12.5 FTE academics, 32% possessed a PhD and 16% were working towards a PhD. In 2013, of the 15.0 FTE academics, 60% possess and a further 33% are working towards a PhD. As well as developing the knowledge, skills and employability of staff, this strategy has enhanced the research capability of the School and increased the pool of supervisors contributing to our doctoral programme (see section cii below).

Quality assurance

Rigorous mechanisms are in place to maintain high standards of research quality, integrity and ethics. All research protocols are considered in depth, and have to be approved by a School Ethics Committee, which is overseen by the College and University Ethics Committees. Internal peer-review processes are also in place to assess the quality of research articles and grant applications prior to submission. Alongside the more formal mechanisms, the research groups also operate collegial support systems, such as 'Papers in Progress' reviewing, whereby all researchers (newer and more established) can seek colleagues' constructive critiques of their work at various stages.

ii. Research students

Research students are an integral part of our research strategy. Each is aligned with one of the five research themes to ensure they receive discipline and subject-specific support. In 2009, the first full-time doctoral studentship (Swann) was appointed as a Graduate Teaching Assistantship (GTA) on our doctoral programme, graduating within three years, in 2012. The success of this first GTA appointment led to a further GTA position in 2013 (Gorman). The College of Social Science plans to support a further GTA appointment each year for the School to aid postgraduate development.

The numbers of full-time and part-time doctoral students have increased steadily from 1.5 FTE in 2008 to 6 FTE students in 2013, as follows:

Year	2008/09	2009/10	2010/11	2011/12	2012/13
FTE	1.5	4.25	6	6	6*

*No increase, as first doctorate awarded replaced by 1 new full-time studentship

To expand research student opportunities (including for part-time students developing their careers), respond to a growing market demand, and further enhance the postgraduate research culture, an MSc by Research was established in 2009. As noted above, the MSc by Research programme also provides the opportunity for staff new to supervision to gain experience of research degrees prior to commencing doctoral supervision.

Environment

The environment for research students is vibrant, enthusiastic and supportive, with University-wide support mechanisms coordinated by the Graduate School, a growing team of experienced supervisors in the School, and a strong research culture developing amongst the students and staff. Within the Human Performance Centre (see details in d below), which houses the School, PhD students have their own dedicated office space with high-specification computers and printer. As this office is within the Centre it encourages students to feel an integral part of the School and its activities. Student representatives sit on all relevant School committees. The research student culture has proved highly beneficial and confidence-instilling, with all students presenting their work annually within the School seminar series, and externally at national and international conferences. In addition to support from supervisory staff, students also help each other with research tasks, including advice on methods, and sharing skills and knowledge. Funded doctoral students have their own budget of £1,000/year to pay for professional development, research expenses or conference attendance, and can also make requests of the School budget. Current and past PhD students also contribute directly to the work of the five research themes, via joint publications with supervisory and other staff, and collaborative research bids. The first doctoral graduate from the programme (Swann) was successful in obtaining a lecturing post at the University in 2013.

Support

Research students are required to produce a Training Needs Analysis log detailing training related to academic needs and employability skills. This log is regularly reviewed by supervisors and annually by the Research Degrees Board, and action is taken, including additional support, should progress be problematic. A dedicated administrator within the School tracks, monitors and guides postgraduate research students and supervisors in adhering to University protocols. Additional support is provided through the University's Graduate School, extensive online and physical library facilities, and information-technology resources (see section d). The Graduate School supports postgraduate research students across the University by providing a range of services, including regular week-long intensive courses on research, generic and specialist research training, careers advice, and academic and social events. The Graduate School also provides a dedicated network to support all research students through, for example, presenting their work at various seminars and at an annual Postgraduate Student Conference, submitting work for publication, identifying potential research funding, and to develop skills transferrable to the workplace. Staff in the School also contribute to the Graduate School's programmes, helping ensure a two-way flow of experience and expertise.

d. Income, infrastructure and facilities

Income

The University supports the School in external income generation through the Research and

Environment template (REF5)

Enterprise Office, which works closely with the College's Research Officer and Business Development Managers, to help identify opportunities for funding and collaborative ventures, and to enhance the standard of grant applications. This combination of staff at both University- and College-levels ensures that approaches are well structured, co-ordinated and effective. In addition, the College of Social Science has a Director of Research, with dedicated administrative support, to lead and encourage a strong research culture. The total income over the REF period, whilst modest, has provided grant submission experience that has led to more recent successes of larger value that bode well for the goal to increase future income generation. Indeed, in the first nine months of 2013 the School won £34,000 of research income.

The research-active staff appointed during the REF period bring with them successes in research grant capture and experience that is being used to engender a research bidding culture. Previous grants include, for example, £125,000 from Sport Wales (2009-11; Principal Investigator, Allen-Collinson) and US\$97,000 from the Kentucky Science and Technology Corporation (2008-10; Co-investigator, Mullineaux). Experienced staff are engaged in supporting those newer to research in applications for research grants. For example, research collaborations between members of HART have resulted in grant applications to the Department of Health, British Academy, Leverhulme Trust and Play England in 2012/13. Multidisciplinary and multi-institutional bids have also been submitted, such as a proposal with the Universities of Northampton, West of England and Gloucestershire. As the five research themes continue to develop and build a reputation for expertise in these areas, our aim is to expand external income generation through research council funding, Knowledge Transfer Partnerships and other knowledge exchange streams, including with partners within and external to the University.

Infrastructure and facilities

The commitment of the University to support the development of Sport and Exercise Science as an area of future research was highlighted in 2009, with an investment of £1.9 million in the Human Performance Centre, which opened in 2010. The Centre is a state-of-the-art facility comprised of specialist rooms and laboratories for sport and exercise science. Additional rooms include offices, meeting and interview rooms, computer suite, coaching suite, seminar rooms and postgraduate research suite. The Centre is attached to the Sports Centre, which enables use of changing facilities and activity areas, including a gymnasium, sports hall, dance studio and astro-turf areas. The development of and investment within the Human Performance Centre has enabled the School to provide the facilities and general environment conducive to conducting world-leading research. The operation of the Centre is supported by two full-time technicians.

The University has provided further capital investment of £710,000 from 2008 to 2013 for the purchase of equipment. This equipment fulfils dual roles in enabling research staff and students to be trained and facilitates research. The Human Performance Centre houses three large open-spaced laboratories, devoted to sport and exercise science activities, and includes the latest technology for conducting research. In addition to standard ergometers for cycling, kayaking, rowing and running, specialised equipment includes a swimming flume (Endless Pool), isokinetic chair (Humac Norm), curve treadmill (Woodway) and cycle ergometers (SRM). To measure performance, we have also focussed resources on obtaining portable devices, primarily to allow researchers to travel to any location, either at the convenience of participants or for the requirements of the research. In addition to the laboratory-based equipment, portable versions for research include those for measuring expired gases (Cosmed K4), team physiological monitoring (18x Zephyr bioharnesses), blood (Analox GM7), force platforms (2x AMTI Accusway Plus), pressure plate (RSScan), electromyography (Delsys and Noraxon EMG), and real-time motion capture (11x Raptor-E and Raptor-4 cameras; Motion Analysis Corporation). This equipment, with both laboratory and field capabilities, provides the School with the flexibility to conduct research in locations more conducive to obtaining ecologically valid results. For example, the motion capture system is being used with elite golfers at golf courses, and in the neuro-psychology laboratories in combination with electroencephalography for measuring skill development.

Wider University support

There are many wider University support systems for staff and postgraduate students. These include extensive online and physical library facilities, information-technology resources and Graduate School. Several specific policies and systems exist to help with research, which include

Environment template (REF5)

the Awards Management System (centralised database to provide better costing and management of financial resources to ensure value for money), Research and Enterprise services (e.g. manage legal, commercial and industrial relationships; provide independent specialist consultant support on bids) and a Research Investment Fund (a central £0.5 million/year pump-priming fund, which is supporting two projects in the School, involving Allen-Collinson, Mullineaux and Smith, in 2013/14).

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

Collaboration, both inter-disciplinary and inter-institutional, has been a key focus of the research strategy, and is a continually developing strength of the School, with demonstrable benefits locally, nationally and internationally. **Locally and regionally**, several large-scale evaluations of government health provision and initiatives have been conducted. These include evaluations for the North East Lincolnshire Care Trust Plus (e.g. regional obesity prevention scheme; Henderson 2012), Lincolnshire County Sports Partnership (e.g. wheelchair basketball in Schools; AEvans 2012), and GP referrals for exercise and physical activity (Crust 2013). **Nationally**, a good example is the research evaluation of England Golf's GolfMark scheme, which aims to accredit centres nationally to provide a suitable environment to increase children's participation in golf, was conducted (Piggott 2011). The high quality of this research has led to funding for more in-depth evaluations and research studies. These projects have given newer investigators the opportunity to develop key research management skills, such as negotiating the needs of businesses and government, and to devise studies that have a more immediate impact on their working practices. **Internationally**, collaborations have generated tangible benefits for both the School and colleagues in other countries, in terms of sharing expertise, doctoral supervision, peer-reviewed journal publications, edited collections, grant submissions and cultural exchanges. Current collaborations include work with colleagues in Australia, Canada, France, Greece, Portugal, South Korea and USA, some of whom are associate membership of our research groups (see examples below).

Examples of collaborations and contributions to the discipline

These include **research funding** (e.g. University Thessaly, Greece: co-investigator on European Union research funding (Olympiou)); **doctoral supervision** (e.g. University of Kentucky, USA (Mullineaux), University of Queensland, Australia (Allen-Collinson), Ping Inc, USA (Willmott)); **collaborations developing Early Career Researchers** (e.g. Technical University of Lisbon, Portugal (Smith)); **hosting international scholars** (e.g. in 2013 Professor R Weinberg, Miami University, USA, world leader related to the MTOUGH group); **external advising and research council reviewing** (e.g. expert written evidence to the House of Lords Science and Technology Select Committee inquiry on 'Sports and Exercise Science and Medicine: Building on the Olympic Legacy to Improve the Nation's Health' (June 2012, Mullineaux), external advisor to the Learning Institute, Oxford University (2007-9, Allen-Collinson), ESRC and Wellcome Trust grant reviewing (Mullineaux)); **editorships** (e.g. associate editor (Allen-Collinson, *The International Journal of Inter-disciplinary Social Sciences*, 2008-2012), editorial board membership (Allen-Collinson, *Sociology*, 2010-present, *Sociological Research Online*, 2010-present, *Leisure Studies*, 2009-present, *The Qualitative Report*, 2013-present)); **external PhD examining** (e.g. University of Wales, Cardiff (Mullineaux), University of South Wales (Allen-Collinson), University of Southern Queensland, Australia (Crust), Universities of Bath, Essex, Gloucestershire and Salford (Allen-Collinson)); **external PhD supervision** (e.g. 7 PhD completions since 2008 at University of Kentucky, USA (Mullineaux), 4 PhD completions since 2008 at University of Exeter and University of Bath (Allen-Collinson)); **student awards** (e.g. New investigator award, BASES Biomechanics 27th Easter Meeting, Belfast (April 2012, Collinson, doctoral student)); **invited professional expertise** (e.g. invited article for Research Fortnight, View from the top section (July 2012, Mullineaux), British Psychological Society assessor for Chartered Sport and Exercise Psychologists (Crust)); and **publications** (e.g. Harvard University, Spaulding National Running Center, US Army Research Institute of Environmental Medicine, Old Dominion University, University of Washington, USA, University of Incheon, South Korea (Mullineaux), Indiana University, Councilman Center for the Science of Swimming, USA (Willmott), California State University, University of South Florida, USA, University of Calgary, University of Toronto, Canada, University of Queensland, Australia, Charles University, Czech Republic (Allen-Collinson)).