

Institution: University of Gloucestershire
Unit of Assessment: 24 – Sport and Exercise Sciences, Leisure and Tourism
1. Unit context and structure, research and impact strategy

Research Highlights

Since the 2014REF and over the course of the current REF period we have far exceeded our strategic aims of:

- i. increasing the **quantity** and **quality** of our published output: over 450 outputs published during the REF cycle with over 100 outputs externally rated 3* and 4*
- ii. increase the number of **PhD completions** and enrolled PGR students (2014 completions 8 v 19.5 completions in 2020; enrolled n = 60)
- iii. increase the amount of **research income** and increase the number of staff securing research related income (2014 income £418K v £1.1m 2020 income)
- iv. developing **research with impact**, in line with the University's strategic aim

In addition, we have successfully implemented strategic changes to enhance the research base by

- i. **aligning our research and teaching strategies and internal structures**, in the context of the University's strategic aim of research-informed teaching, ensuring **greater coherence** between teaching and research, and through involving students in research publication;
- ii. **increasing our postgraduate research cohort** by validating a professional doctorate in sport and exercise;
- iii. **developing** a more **balanced** research structure aligned to the newly created University Research Priority Areas: moving to four key research themes with two themes embedded in both our subject communities which encompass the research aspirations of **all** the UoA's staff. These themes are **strategically** linked to the University Research Priority Area strands.
- iv. **developing** early career researchers via the newly developed University Early Career Researcher network and **strategically** appointing external fellows, associate professors and professors to the four key research themes

UoA structure and governance

Since the 2014REF the University reviewed its governance and structure of research related activity and moved to strategically organise and manage research via Research Priority Areas (RPAs). This UoA sits within the University's RPA of *Sport, Exercise, Health and Well-being* and comprises staff from 2 Schools: School of Sport and Exercise, School of Natural and Social Sciences. RPAs were conceived and built upon research strengths with a long-term strategic vision to promote and develop world-class research areas encompassing a range of disciplines. This dynamic academic culture empowers staff and enables the training of postgraduate research students in world-class facilities. Excellent multi- and inter-disciplinary research networks exist within the UoA, which extend to world-leading national and international collaborations.

Research activities are hosted by the RPA and supported within the School of Sport and Exercise by a Postgraduate Research Student Lead (PGRL) who co-ordinates writing retreats, workshops, seminars and conferences for the PGR students. The PRGL is supported by two research leads embedded within the two subject communities. This structure helps to deliver the key research strands identified within the School Research Plan and provide a structure around which to organise pro-active and re-active research bids and a coherent external 'brand' for the UoA's research activities in an increasingly

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competitive research market. The RPA Leadership team (which comprises the RPA lead, UoA co-ordinator, PGRL, Subject community research leads and Early career research lead) facilitate and direct strategy across the UoAs. four strands both in terms of research output and income generation. The UoA benefits from a number of collaborative relationships with universities both in the UK and overseas and hosts one visiting professor, three visiting associate professors and three visiting research fellows. The School has also hosted circa 15 visiting International PhD students from around the world including the USA, Czech Republic, Spain and Germany.

A restructuring of the School of Sport and Exercise research strands and subsequent strategy was developed after an external review of the School in 2018. The proposed research strands for the School were aligned with RPA objectives and based within the two subject communities that make up the School (Applied Sport and Exercise Sciences (ASES); Community, Leadership, Education and Society (CLES). The strands were framed within the context of six key considerations: 1) an identifiable critical mass of researchers; 2) current REF output; 3) current and potential impact; 4) strong links to national and international organisations; 5) potential for grant income; and 6) a direct link to teaching, including opportunities for students to engage at all levels with the research strand. Based on discussions with School Academic Subject Leads and RPA leadership team, the UoA developed 2 key themes in each subject community:

(CLES) – Theme 1: **Pedagogy, coaching and ethics;**

Theme 2: **Community and inclusion;**

(ASES) - Theme 1: **Physical activity intervention in populations with long term diseases;**

Theme 2: **Injury management in sport**

All staff within the UoA align to one of the key themes, although this structure also allows staff to work across themes in a multi-disciplinary way. A good example of this is evident in the impact case study led by **De Ste Croix, Hughes and Roberts**, as this work sits in both the **pedagogy, coaching and ethics** theme, as well as the **injury management in sport** theme. Strategic external appointments of visiting fellows, associate professors and professors to each of the key themes was employed, where strong existing relationships were formally recognised. It is the ambition of the UoA to grow these themes in terms of numbers of staff involved in writing research outputs and identifying potential Impact Case Studies for REF2027.

UoA research strategy

The UoA's mission is to be located as a centre of excellence in research by academic and practitioner communities and to guide and influence national and international policy development through rigorous and theoretically-informed research and evaluation. The School has enjoyed particular success in more recent years in relation to research publications/outputs, PGR recruitment, and research grant bidding. The School has a strong track-record in collaborative, evaluative and multidisciplinary research and is a major national provider of innovative programmes and courses in sport, exercise and health the delivery of which draws upon its research base. A key component of our research expansion has been the development of significant collaborative research activity with a range of external collaborators. In line with University's development of research leadership via the RPA structure the UoA set out to structure its research strategy (and related activities) around three main areas, aimed at increasing the quality of outputs, potential for external research grant bidding and generating impact: (i) developing

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early career researchers; (ii) one-to-one and group mentoring to develop individual research outputs and profiles; and (iii) instigating a rolling programme of internally funded research projects (via the RPA). To deliver on this strategy the RPA has funded the following activities over the REF cycle to promote research output, impact and environment:

- 1) 2.5FTE Research assistants on 3 year fixed term contracts – RAs ran a research seminar series as well as aiding staff in circa 20 projects
- 2) 12 writing retreats
- 3) Impact Case Studies
- 4) 40 Research Projects via a small grant scheme
- 5) A 0.5FTE research technician to support building bespoke equipment and servicing data collection
- 6) A yearly conference and support for the Early career research network
- 7) The purchase of new equipment so that novel techniques could be employed
- 8) A number of MSc by Research projects aimed at evidencing impact

This strategy resulted in a significant increase in the quality of research outputs, pump primed projects for staff to apply for external research funding, provided early career staff with the opportunity to bid for internal research funding, and secured bespoke equipment for research projects. In this process experienced researchers (including the visiting fellows, associate professors and professor) peer-mentored early career researchers in bid writing, project management, data collection, research output, dissemination and impact. Thus a key part of the UoA strategy was to develop our current talent pipeline through the identified University Teaching and Research strand. Research within the UoA has also historically used a student model to involve students at all levels of study in staff research and this was a key component to the current REF strategy. This has all led to exceeding the strategic aims set out after the 2014REF outcome, as highlighted at the start of this section.

Impact development

The UoA has always aimed to conduct research with impact and this was evident in the outcomes of the 2014REF submission with 100% of the impact identified as 3 and 4*. The development of this emerging impact in 2014 was strategically supported, with both impact case studies in the current submission an extension of work submitted in 2014. One of the key strategic aims for the current cycle was to build upon that strength, especially the applied nature of the research within the UoA. This is built upon strong links with organisations, external communities and research partners around the world. The success of this strategy is evident in the number of commissioned pieces of research, by large organisations, focusing on the impact of specific interventions in the two impact case studies. Part of the impact strategy was also to start to develop impact in the research undertaken in the 4 defined research themes with the view of establishing potential impact at the design stage of research projects. Experienced research staff and the visiting researchers have worked with early career researchers to ensure that impact is embedded at the study design stage of projects. Impact of the research work within the School is important for further developing links with organisations and also provides both postgraduate research as well as undergraduate students with opportunities to gain experiences of working with national and international organisations. Moving into the next phase of the UoA research strategy is to identify a range of impact case studies for 2027 but also encourage staff to ensure that all research is impactful. Dedicated CPD sessions have focused on impact generation and the annual RPA symposium in 2019 focused on generating and embedding impact into research projects. For coherence the 2020 symposium is focused on using impact to apply for research grant bidding. In addition to the submitted impact case studies other areas of work that have seen emerging impact, are in ethical governance in sport (**Ryall**), vascular physiology and health (**Fryer**), athlete well-being and

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the dual athlete (**Campbell**), biomechanics in World Athletics (**Bissas**) and biomechanics in children with cerebral palsy (**Theis**).

Future research and impact strategy

The key strategy for the next REF cycle is to continue to produce impactful research by supporting staff to publish and maintain the current volume and further enhance the quality of outputs and to include impact as a key part of the research design process. Part of the strategy is to continue to develop early career staff who have a practitioner focus, who are embarking on developing research informed practice, via enrolment on PhD and Prof Doc programmes (currently 3 staff are enrolled as Research Students with 3 more starting in 2021). The key research objectives for the next REF cycle are:

1. Identify and develop potential Impact Case Studies for 2027 with support from internal funding and via external commissioned research.
2. Encourage staff to attend writing retreats and CPD events to enhance 3/4* outputs
3. Ensure that all research active staff have publication plans which feed into the annual cycle of discussion around effective use of Research and Scholarly Activity time
4. Continue to mentor early career staff via the early career researcher network and to bid to the internal small grant scheme funded via the RPA
5. To ensure that an effective mentoring approach is embedded in across the 4 research strands
6. To effectively use the expertise of the visiting fellow, associate professors and professors in developing a sustainable research environment within the School
7. To ensure that the PGR plan aligns with the 4 research strands within the School to maximise output, impact and environment
8. To maximise collaborative research with staff in the growing School of Health and Social Care, and in Technology and Engineering
8. To increase the number of staff applying for external research grant funding
9. For PGRL and community research leads to continue to provide events for PGR students and staff to enhance the research environment

2. People

The University's commitment to equality and diversity is embedded in our values and in our People and Culture Strategy. Some of the key University headlines since the 2014 REF which have influenced the UoA include:

- a new corporate Strategic Plan for 2017-2022, underpinned by a new Academic Strategy and a new People and Culture Strategy.
- a new framework for the direction and management of research across the University, overseen by a new Research Committee chaired by the Vice Chancellor.
- a review of the pipeline to Professor and Reader and to improve the diversity of our Professors and Readers.
- launch of an Early Career Research Network for early career academic staff and postgraduate research students.
- preparation of a revised and updated statement of Academic Career Pathways, to give clarity to the expectations of academic staff at each level.

- female professors forming a group to review issues of gender in relation to research at the University.

Staffing strategy:

The present submission comprises 15.2 FTE staff, with most on full-time or fractional teaching and research academic contracts, two on fractional fixed term research contracts and one on a full-time research contract. The current submission is made up of 2 Professors, 2 Readers, 3 Senior Research Fellows and 10 senior lecturers, which constitutes 49% of School staff. Although the total FTE is slightly lower than the last REF the percentage of staff submitted is greater than the 2014REF submission (33%). All staff have responsibility for delivering varying amounts of undergraduate and/or postgraduate teaching and for academic-related administration. Two staff (**James** and **Bissas**) hold significant structural management positions. 45% of the current submission are female staff and this is an increase from the last REF submission where only 32% were female. This has been enhanced by the appointment of a number of experienced female researchers since 2014, including **Turner**, **Theis**, **Bullingham** and **Campbell**. The appointment of an experienced researcher (**Bissas**) to a structural management role with line management responsibility was strategic in guiding and mentoring staff in the ASES academic community. In this cycle **Ryall** was promoted from Senior Lecturer to Reader, further strengthening the female research leadership in the UoA. **Baker** was also promoted from Research Fellow to Senior Research Fellow and took up the role of postgraduate research lead in this cycle. In terms of staffing strategy and development around research related-activity, since 2014 a significant amount of time and resourcing has been invested into the one-to-one and group mentoring of School/UoA staff specifically in relation to research outputs and impact. As part of **De Ste Croix's** wider responsibilities, all staff are offered monthly, bespoke support sessions in relation to research outputs, grant bidding, impact generation and broader career development. Senior staff, including the community research leads and visiting researchers, routinely offer to co-author with early career researchers to initiate publishing presence/profiles. **Garner** and **Croad's** appearance in the present submission are excellent examples of this process, as both are currently undertaking their research degrees and publishing at the same time. A core part of the UoA strategy was to formalise long standing external academic partnerships by appointing a number of Visiting Fellows, Associate Professors and Professors in line with the key research themes in each of the 2 subject communities within the School. Visiting Professor **Jean Cote** and Visiting Fellow Dr **Richard Harry** supports CLES theme 1, Visiting Associate Professor Dr **Wendy Russell** supports CLES theme 2, Visiting Professor **Neil Cronin** and fellow Dr **Ross Julien** support ASES theme 1 and visiting Associate Professors Dr **Paul Read** and Dr **Francisco Ayala** support ASES theme 2. This critical mass of visiting researchers contributes significantly to the UoAs research environment by co-supervising PhD and professional doctorate students, leading research workshops for both staff and students (as part of the subject community research seminar series and RPA symposium), mentoring early career research staff and co-writing with staff (over 60 co-written publications). The visiting researchers bring a wealth of experience in successful grant bidding, having secured over £5m over the past 10 years. Additionally the longstanding collaborative relationship with **Read** and **Ayala** has contributed to one of the submitted impact case studies.

Staff development and mentoring:

Where broader career development is concerned, junior colleagues are encouraged to explore and expand their involvement in relation to activities such as: reviewing for journals, income generation opportunities, and internal research management responsibilities. The development in the current REF cycle of the University Early Career Network (ECRN) has had a significant impact on staff, who in some areas of the UoA, are practitioner academic focused, and has helped underpin their practice and teaching with sound research. In 2018 subject community research leads were established to continue to help mentor early career researchers in the school. These roles are unique to the institution, and the subject community research leads initiate and run bespoke research related CPD events in their subject communities, linked to the ECRN. The development of early career researchers and on-going career progression remains

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core to the staffing strategy of the School/UoA. It is also common practice within the School/UoA to promote the combining of postgraduate study with contract research. For example, where a research project warrants the employment of a full-time Research Assistant, staff will often negotiate for the project funding to at least partly cover the PGR fees of the RA. This provides appropriate RA capacity for the project whilst contributing to the UoA PGR numbers. This model also provides an excellent platform for RAs who, as early career researchers, are able to gain valuable contract research experience whilst obtaining a higher education qualification. In these instances, Project Leads act as part of the RAs supervisory team.

The 2.5FTE fixed term Research Fellow appointments were designed specifically to address an identified need for expansion in Sport, Exercise Health and Well-being. Given the gradual turnover of staff within the UoA it is not uncommon for those who enter on research-related contracts to be appointed to full-time, permanent academic contracts before the end of their initial period of tenure. A good example of this is **Sumner** who was one of the research fellows and is now senior lecturer in psychology and lead for one of the impact case studies identified in section 3a. The UoA utilises the Researcher Development Framework (RDF) as a model around which to base (and enhance) the career development and progression of its research active staff, i.e. transferability of skills, employability, personal development needs, career progression, and public engagement. At the School/UoA level they are overseen and monitored by **De Ste Croix** and **Ryall**. Maintaining standards of research quality and integrity on an on-going basis remains a crucial function of the UoA. Project management is self-selecting as a consequence of the fact that staff lead on and manage the projects that they initially bid for (in line with the 4 strategic themes), ensuring a measure of expertise and seniority. Draft papers and reports are internally discussed and peer reviewed via research seminar series and research reading groups. In terms of the present submission, all research outputs were subject to review both internally (by the UoA lead) and externally by a nominated external assessor. Through the annual scheduled and informal activities, including the annual RPA Symposium, staff must present any projects funded via the small grant scheme. All research tenders, formal bids and associated data collection procedures are subject to mandatory internal procedures surrounding research ethics and are dealt with at an institutional level by the University's Research Ethics Committee (REC) and/or at the School level by the School Research Ethics Panel (SREP), depending on status.

On-going support for the career development of all staff is systematically provided through the annual process of Staff Development Review (SDR) where staff discuss their research plans for the year. These then feed into discussion surrounding research objectives for the coming year with their line managers.

Research students

A key strategy of the UoA action plan since 2014 was to continue to have research degree students as a central part of the units research environment, allowing staff to gain supervision experience. This has been successful with a doubling of research degree completions from 2014 (n = 8) to the current submission (n = 19.5). Over the REF period there has also been 10 MSc by Research completions. The table below articulates the FTE of postgraduate research students enrolled on doctoral programmes within the School/UoA as of the census date (n = 60).

Item	n	%
<i>Gender</i>		
Male	39	65.0
Female	21	35.0
<i>Level</i>		
MSc by Res	13	21.7
PhD	27	45.0

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Prof Doc	20	33.3
<i>Mode</i>		
Part time	51	86.4
Full time	8	13.6

PGR numbers have been boosted by the strategic validation of a Professional Doctorate in Sport and Exercise in 2017. The School recognised, through its strong links with national governing bodies, that there was a need for a professional doctorate to meet the level 8 needs of practitioners. So far 3 cohorts have enrolled onto the professional doctorate (n = 20) with the first of those cohorts now in the research phase, with some students close to examination. 20 staff across the school are supervising research students, including our visiting researchers. Most students tend to be part-time (especially those enrolled on the Professional doctorate) and those who are full time tend to be on research scholarships, often tied to commissioned research project.

The operationalization of all PGR administration is carried out by the University's Academic Development Unit (ADU) which monitors and records student progression. The ADU also oversees the admission, training, supervision and progress of PGR students although the individual allocation of supervisory teams is negotiated at School level with the PGRL, and aligned to the 4 themes in the School research plan. The ADU also hosts a centralised system of supervision recording and an annual Training Needs Analysis and Joint Annual Progress Reporting both of which are completed by way of open consultation between students and supervisors. Student record-keeping and reporting is managed through the MyGlos portal, and the ADU maps PGR research at the University against the QAA Research Development Framework. All students complete two taught modules focusing on philosophy of research and methodology and methods, which must be passed for students to continue on their research journey. These modules feed directly into a detailed research proposal (project approval form) which is submitted, following a rigorous process of scrutiny of their viability amongst supervisory team members, to school panel members. This happens normally within one year of registration, and is a pre-requisite of proceeding to data collection and the ultimate completion of the thesis. These monitoring and training process address the broad range of skills and development that a student needs in preparation for employment and effective further academic work (in accordance with the RDF). The ADU holds a number of 'shut up and write' sessions for PGR students across the year and also hosts an annual conference and summer school at which students have the opportunity to present papers to their peers. Students also compete in the 3-minute thesis national competition. The RPA also holds a seminar series for PGR students and all PGR students are invited to present their work at the Annual RPA Research Symposium. PGR students have access to teaching opportunities and are encouraged to engage fully with the Postgraduate Research Experience Survey (PRES). Students are also encouraged to network nationally/internationally in their subject area and are provided with an annual professional development budget.

Equality and diversity

Equality, diversity and inclusion are intrinsic not only to the values of the University as a whole, but also to the UoA. The University of Gloucestershire was shortlisted for its outstanding contribution in the *Times Higher Education* 'Equality, Diversity and Inclusion Awards' in 2020. The University provides specific mechanisms to promote the on-going support and mentoring of female and early career members of staff and other under-represented groups, as reflected in its Women Professors Group, Women's Network, BAME Network and Early Career Network. The Women Professors Group has an explicit remit to support and mentor female academic staff in their career

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progression and promotion. The Women Professors Group actively seeks to rectify the gender imbalance currently evident in senior and executive academic leadership across the sector, as well as in areas of access to research opportunities, research funding allocation and publication. In a recent example, in collaboration with the university's Women's Network and individual members of staff, the Women Professors Group organised a series of informal interviews and an open online plenary focusing on 'Women Negotiating Academia: Empowerment and Challenges' as part of the University Festival in 2020. A representative of the Women Professors Group sits on the University's Professorial Appointments Panel and the Women Professors Group is spearheading a culture shift in practices aiming towards academic career progression and leadership.

Members of the UoA team have attended university-wide training programmes on issues relating to equality, diversity and inclusion. One example of this was the unconscious bias training for all UoA coordinators, attended by **De Ste Croix**, with other members of the team attending similar training events. Staff across the UoA have been encouraged to engage with the Code of Practice, and transparent processes have been in place throughout the REF cycle. This includes the selection of outputs for the current submission. All staff were asked to rate their outputs which were also rated by the UoA co-ordinator and an external academic. Once papers were rated on an annual basis all staff members had a one-to-one meeting with the UoA co-ordinator. For final selection of outputs staff were asked to rank their papers and this was transparently discussed with the UoA co-ordinator. In line with the code of practice final selection of outputs was undertaken by the UoA co-ordinator with help from senior researchers in the UoA. Final selection was discussed with all members of staff entered. Throughout the REF cycle all members of the UoA have been provided on an equal basis with the opportunity to bid for internal research funds, to lead and take an active part in impact case study projects and to supervise research students.

Equality, diversity and inclusion is a large part of a number of staffs research within the UoA, and this is shared in research seminars and workshops. The school has a large focus on women's sport and co-own Severn Stars netball team and is an FA high performance centre for women's football. A number of staff in the UoA are members of the national Women in Sport and Exercise (WISE) group. **De Ste Croix** was a keynote speaker at the WISE conference in 2019 and **Bullingham** was the conference organiser in 2020, reinforcing the UoAs passion for women in sport. **Bullingham's** research has focused on gender stereotypes and lesbian athletes in sport, work which she has shared with staff and students. She has also talked on the BBC: 'The LGBT sport podcast' and presented on this topic in one of the University's 'Livingroom Lectures' during the pandemic. Based on her research **Bullingham** recently organised an equality, diversity and inclusion week for undergraduate, post graduate students and staff. Seminars and workshops included topics such as non-binary sporting life histories, England Swimmings LGBT+ 'pride in the water' project, active communities role in race, ethnicity and sport, misrepresentation of trans in the media and work of the Black Prince Trust. Additionally, **Ryall** has shared her research on ethical issues in sport around sexual discrimination and good governance in sport to staff and students across the University.

All members of academic staff in the UoA on fractional appointments are allocated pro-rata equivalent mandatory 'research and scholarly activity' hours on their annual balance of duties as set out in the Work Allocation Model. Additional hours may be allocated to allow fractional and part-time members of staff to undertake funded research projects. The University promotes the welfare of all staff and students through a variety of avenues and protects staff and students through the provisions of the 2010 Equality Act. The University has achieved Level 2 of 'Disability Confident' and is actively working to reach Level 3. This Level would identify the University as a Leader. Access to specialist equipment, ICT hardware and software programmes, guided support and safeguarding measures are in place to facilitate the day-to-day work of staff and students with notified disabilities. The University took an early initiative during the 2020 Covid-19 lockdown, significantly in advance of the formal institutional shutdown, to allow shielding and vulnerable staff

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and students to work exclusively from home, and support to do so was quickly made available online.

3. Income, infrastructure and facilities

Income:

A key research aim since the 2014REF was to diversify not only the range of organisations funding research, but also to support a wider range of staff applying and securing grant income. The UoA has witnessed significant growth and expansion in relation to its research income generation activities across local, national and international contexts. Total income from the 2014REF cycle was £418k and this rose to £1.1m during the current cycle. The diversity and range of income generation is evident from health related bodies, such as NHS clinical commissioning groups, local authorities such as Gloucester, Wiltshire and Bristol City Councils, national sports organisations such as the FA and Sport England, community trusts such as the Rio Ferdinand Foundation and Joseph Rank Trust, as well as local sports teams and schools such as Bristol CityFC, Forest Green RoversFC and the Kings School. In addition to the income generation secured for UoG, total research income from research projects that UoG staff are involved in have been in excess of £4m. Some of this commissioned research features in our impact case studies (see REF3b) and shows the breadth of staff securing income. The UoA has been especially successful in securing income generated through EU sources over the period, via five EU projects involving 20 partners across Europe: SSaMs (Sports Students as Mentors - for boys and young men: **Baker [PI]** and **Parker**); RISK (Reducing Injury in Sport with Kids: **De Ste Croix [PI]** and **Hughes**), EGS (Employability of Graduates in Sport, EU Lifelong Learning: **Crone [PI]** and **Baker**); TAGS (Teaching awareness of Ethical Governance in Sport: **Ryall (PI)**); SPaCE (Supporting Policy and Action for Active Environments: **Crone – [PI]** and **Baker**). Sport England funding has also been significant with two major projects funded 'Switch the Play' (total budget £1m: **Campbell** and **Roberts**) and 'Boing' (total budget £120,000, **Roberts** and **De Ste Croix**). Other examples of the breadth of research income comes from vascular physiology (**Fryer**), clinical biomechanics (**Theis**), sociology of youth offenders (**Parker** and **Morgan**) and health and well-being (**Baker**). Research funding contributes not only the financial sustainability of the UoA/School but also to the breadth and quality of research publications and a number of submitted outputs draw on work funded through these income streams. Most staff included in the submission have all been involved in research income generation as either PIs or contributing researchers. This development in the volume of staff securing research related income is due to the mentoring model for early career researchers that has been in place since the 2014REF outcome. The RPA small grant scheme has helped staff with bid writing skills, alongside project management skills, as the scheme is a competitive bidding process. One of the key aims of the scheme is to pump prime research areas so that staff are in a position to apply for external funding. A good example of this schemes success is the work of **Roberts** who secured internal funding to develop his work on physical literacy and play. This in turn led to substantial commissioned funding from Sport England to evaluate the effectiveness of the BOING programme, and ongoing talks with GB Hockey for commissioned research. It is envisaged that such activities will further enhance the income generation and business development profile of the UoA during the next REF cycle, broadening the expertise, impact and reach of the UoA. Core strategies of generating grant income are integral to the overall research strategy as detailed above. One central focus for future income growth will be continuing to secure research evaluations with charitable organisations and government departments, as well as sport governing bodies which cohere with recent internal RPA small grant investment. There is growing opportunity to bid with staff in the School of Health and Social Care in the health related areas of work in the UoA, especially in vascular health and mental health and well-being. There is also growing collaborative research grant possibilities in technology and engineering, with the UoA looking to appoint a Professor of Sports Technology in the future.

Infrastructure and Facilities

Since the 2014REF there has been significant investment in infrastructure and facilities with the building of a new £7.5m Sports Park which is integrated with the Oxstalls campus where the

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School of Sport and Exercise is located. The UoG sports arena is a 700 seater International standard indoor arena which houses teaching spaces including a sports therapy room and a cryotherapy pool. There are flexible research spaces for 'pop up' labs for testing of teams who are using the facility. The sports park houses the existing Oxstalls LTA tennis centre with 4 floodlit clay courts, a sand based astroturf and 26 hectares of grass pitches. Two new 3G floodlit football and rugby pitches, meeting FIFA and World Rugby standards allow field-based research to be conducted throughout the year with clubs and teams who are using the new facilities. Further facility developments at the Oxstalls campus are ongoing alongside allied health professions, especially physiotherapy, with the design of a new functional rehabilitation space for strength and conditioning and sports therapy. The new functional rehabilitation spaces will support the ASES research strands, and further enhance the impact case study work into movement competency and injury risk/rehabilitation. Bespoke areas for sports therapy and strength and conditioning have been expanded since the 2014REF outcome. A new strength and conditioning suite was built at a cost of £350k which also included a remodelling of the biomechanics laboratory. This space is regularly used for teaching and research but is also used by the national governing body (UKSCA) for weekend workshops and seminars. Investment in sports therapy saw the creation of an additional 18 bed space at a cost of £45k. More recently additional research and teaching space on the Oxstalls campus has seen the creation of a new psychology laboratory and a new physiology/nutrition lab. These additional facilities since the 2014 cycle complement the existing extensive facilities that include physiology, biomechanics, biochemistry labs, and an environmental and altitude chamber. Alongside teaching facilities for sports therapy the University hosts a separate sports injury and massage clinic space that is also used for research projects. PGR students enjoy protected workspace and facilities in the newly built business school at the Oxstalls campus.

Equipment

There has been substantial strategic investment in equipment since the 2014REF which mainly involves purchasing equipment that is portable so that applied work can take place in the field. Circa £700k has been spent during the cycle by updating and complementing existing equipment, alongside the investment in new equipment from RPA research funding. This includes but is not limited to 5 portable force plates, timing gates, portable contact mats (Smartspeed) and Optojump system, 30 GPS units, and portable strain gauges. As significant aspects of the research of the UoA takes place in applied settings, and the recognition that the industry is embracing digital and wearable technologies, there has been a strategic investment in mobile technology. This includes significant investment in iPads, APPS, and Macbooks. The success of this strategy means that equipment can be based at professional clubs so that season long/longitudinal data can be collected. A good example of this is the purchase of a GPS system from RPA research funding which has been used season long by Bristol City Women's football team (as part of the University's status as an FA High Performance Centre for Women's Football). Partner clubs have bought the same equipment so that joint research can take place using the same equipment. For example Bristol CityFC academy purchased an Optojump system so that season long data could be collected. Via the RPA QR funding investment in a new ultrasound unit has enabled both the vascular physiology staff and muscle mechanics staff to measure blood flow dynamics and muscle fibres, as well as looking at novel techniques for determining muscle volume. The purchase of a new 10 camera Vicon system, to complement an existing 8 camera system, allows for more detailed 3D analysis for movement. A new cryotherapy pool is housed at the Oxstalls sports park arena to examine recovery from sport and exercise. New blood pressure monitoring equipment

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and two near infrared spectroscopy equipment has allowed the vascular physiology group to make new novel measurement in vascular flow dynamics, and collaborate with colleagues in the USA.

4. Collaboration and contribution to the research base, economy and society

Beyond the collaborations identified in the impact case studies, staff from across the UoA have forged strong collaborative research partnerships with local sports teams, local and regional NHS providers, community groups and charities, National sports governing bodies, International Sports governing bodies, and academic partners around the world. Aside from formal collaboration within the institutional structure of the RPA and UoA, staff collaborate regularly with a wide range of organisations including inter-disciplinary collaborations within the UK and across Europe; such as psychology, public health, nutrition, physiology and public policy. In terms of multidisciplinary working, co-collaborators include those from primary care (GP's, nurses, physiotherapists), mental health (psychiatrists, mental health nurses, exercise scientists), public health (public health consultants, promoters), local government (leisure services, physical activity promotion specialists), and the Third sector (CEO's). UoA staff have forged many long-standing partnerships with colleagues at other HE institutions with whom they have actively tendered for a variety of research projects. Principle examples in the UK include the Universities of: Loughborough, Exeter, Salford, Warwick, Birmingham, Leeds, York St John, Chichester, Royal Holloway, Portsmouth, Lincoln, King's College, Swansea, Chester, Plymouth, Ulster, Bath Spa and Cardiff (Metropolitan); and Internationally: Bielefeld (Ger), Southern Denmark, Thrace (Greece), Murcia (Spain), Vitoria (Spain), Olomouc (CZ), Massey, (NZ), Rochester (US) and New England (Australia). An excellent example of this collaborative working is the joint work of **Fryer** and PhD students focusing on vascular function and disease, often working on multi-million dollar research projects with the University of North Carolina in the US. The success of the UoA in securing significant European funding over the period is testament to the quality and depth of some of these relationships. Collaborations with high level consultancies, NGBs and private industry providers are also central to the UoA's mission and success in securing commissioned research; notable examples include the Football Association, Sport England, UK Coaching, UKSCA and ECB. Members of the UoA contribute to the discipline and research base in a variety of ways through the provision of expertise, assessment and peer review across the external academic and research environment. **Ryall** is Chair of the British Philosophy of Sport Association and Executive Committee member of the International Association for the Philosophy of Sport. **Roberts** is vice chair of the International society for Physical Literacy and **De Ste Croix** is Deputy convenor of the BASES special interest group: Paediatric Sport and Exercise. **Cote** was Chair of the Research Committee for the International Council for Coaching Excellence.

All research staff regularly peer review papers for high quality international journals across a range of mainstream and specific disciplinary areas including: physical activity, public health, psychology, physiology, biomechanics and social science and collectively, UoA staff act as reviewers for over 80 academic journals. Staff sit on a variety of journal editorial boards including: Isokinetics and Exercise Science and BMC Pediatrics (**De Ste Croix**), Journal for the Philosophy of Sport (**Ryall**), Sports Medicine and Frontiers in Cardiovascular Medicine (**Fryer**); Frontiers in Rehabilitation Sciences (**Theis**), Scientific data - Nature (**Bissas**), International Sports Coaching Journal, International Review of Sport and Exercise Psychology and The Sport Psychologist (**Cote**), Higher education journal of teaching and learning (**Roberts**). A number of staff in the UoA have been grant reviewers for a number of organisations including **Bissas** for the Czech Science Foundation and Aristotle University of Thessaloniki University, Greece; **Cronin** for international grant agencies

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in Belgium, Netherlands, Austria and France; **De Ste Croix** for MRC and Social Sciences and Humanities research council of Canada (**Cote**).

Through their research the majority of staff are Accredited members/members of their respective academic societies (i.e. BASES, UKSCA, SST, BASRAT), hold Chartered Scientist status (CSci), and regularly make contributions as members of the organising committees of national and international conferences, as well as contribute to expert statements. Academic and disciplinary development is especially pertinent to HE collaborations, and UoA staff are regularly involved in higher degree external examinations; recent PhD examiner appointments at Durham, Cardiff, Leeds Beckett, Liverpool John Moores, exemplify this. The international reach of staffs work within the UoA has also led to invitations to examine PhDs in other countries including Spain (Murcia University, University of the Basque Country, Elche University); Czech Republic (Palacky University); Singapore (Nanyang Technological University); Denmark (Aalborg University); Belgium (Ghent University); Australia, and Turkey (Middle East Technical University). At a broader consultancy level with national organisations, **Hughes** has worked with the Great Britain Ice Hockey Association, and Italian Lacrosse; **De Ste Croix** with English and Welsh FAs, the England and Wales Cricket Board, Czech and Spanish Football Federations, Czech handball and volleyball federations; **Roberts** and **De Ste Croix** have worked with UK Coaching, Sport England; **Bissas** and **Cronin** with World Athletics have carry out the biggest biomechanics research project ever conducted in athletics during the IAAF World Championships London 2017.

Strategic dissemination of research within the UoA is central to the reach of the work and staff have presented their research at International conferences around the world. **Over 700** conference presentations from staff and students in the UoA during this REF cycle have contributed towards the research reach and significance. Importantly in recognition of the research reputation of staff, over **55 invited keynotes** have been delivered by submitted staff in the UoA.

Ryalls work has developed strong links with **Sports Resolutions** which has enabled the organisation to thoroughly review their cases and led to the provision of a public repository of cases. This repository is available in three other languages and therefore can be utilised in other countries to improve their sports governance. This research has led to the development of resources across Europe via the Erasmus funded project 'Teaching Awareness of Ethical Governance in Sport (TAGS)' in that a compendium of case studies relating to ethical governance in sport, to be used in educational settings, is now being used in 5 European countries. **Ryalls** Internationally recognised research has also led to her being appointed onto **UK Athletics** new Standards, Ethics and Rules Committee. **Ryalls** work has also led to her being invited onto a working group as part of **Sport England's** evaluation of their guidance on transgender issues in sport, and she has been part of a working group for **UK Coaching** reviewing their framework for safeguarding children. Alongside this the research of **Bullingham** on homophobia in sport has led to her appearing on the BBC and Radio 5 Live. This research area has been identified as a potential impact case study for REF2027, given its wide-reaching impact on people, practice and policy.

Theis research into children's disability has led to her becoming Head of Research and development for the Chamwell Centre Charity. Both **Theis** and **Campbell** sit on the board of Trustees for the charity. The Chamwell centre is a newly built £5.1 million facility in Gloucester, funded by numerous disability charities, for both children and adults with varying disabilities. **Theis** and **Campbell's** research helped to design the facility to allow for research to be conducted

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through a range of organisations including **muscular dystrophy UK, cerebral palsy UK**. Gloucestershire NHS are already using the facility and conducting research on quality of life based on the research of **Theis**. **Theis's** research into race running (funded by Action medical research for children) has directly led to an upsurge in race running clubs around the country and increased the number of participants in race running.

Hughes research expertise has led to him being a founding member of the **UKSCA** research grant awarding board. This national governing body allocates research funding to a number of strength and conditioning projects yearly across the UK. **Hughes** research expertise in paediatric strength and conditioning has led to him consulting with a number of sports teams, leading to funded scholarships from **Bristol City Football Club and Bristol Bears rugby**. Based on his research he has been invited as the academic lead for **Wales Women's Rugby Union Research group**. Locally Hughes has developed and managed the Kings school (Gloucester) Gifted & Talented Programme.

De Ste Croix's research into injury risk and management in youth sport, alongside talent development research, has led to invitations to contribute to expert statements, national media events, delivering at CPD events for national organisations and steering groups for women's football, coaching children and talent development. Based on his talent development research **De Ste Croix** was invited by the FA to be part of a working group, tasked to develop the FA Level 3 Talent Identification course. **De Ste Croix** now delivers his research on growth and maturation in elite soccer on that course as an FA tutor. Based on his work into women's football **De Ste Croix** was also invited as a founding member of the Research in Women's football group, formed by the FA in 2019. He was invited to act on a steering group for **UK Coaching** exploring developing an operational plan and framework for coaching children.

Fryers world leading research into rock climbing led to him becoming the founder member of the International Rock Climbing Research Association. In 2018 he was an invited keynote speaker at the International Mountain and Outdoor Sports Conference in the Czech Republic and the International Rock Climbing Research Association Congress hosted by the **International Olympic Committee** in France. **Fryers** Internationally recognised work on vascular flow and health has led to him being invited onto the European Network for the Promotion of Health-Enhancing Physical Activity (HEPA) who report to the **World Health Organisation (WHO)**

Based on his Internationally recognised research **Roberts** is the research lead and vice-chair of the International Society for physical literacy. His research has led to working as an Expert Advisor on Pedagogical Approaches to Academy Coaching for **Southampton football club** and **Manchester United football club**. This work based on his research into constraints coaching and physical literacy and play has impacted the philosophy of the types of training and direct practice that coaches have adopted by these world leading football academies. **Roberts** research impact within communities is evident in the commissioned evaluation of two projects: 'Engaging hard to reach young people through sport: a 5-year evaluation' (commissioned by The Berkeley Trust) and 'Street Elite' (commissioned by The Berkeley Trust and the Change Foundation).

Garners research on coach-athlete interactions has resulted in him being invited as a performance consultant for **England Lacrosse**. **GB Rowing** have conducted a full review of their coach education systems and processes based on **Garners** research on coaches learning in social spaces. **Garner** also consults for the **British Association of Snowsport Instructors (BASI)** and

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his research has informed the training and assessment syllabus across four levels of qualification, including the highest level which is internationally recognised and aligned with other European nations.

Cotes world leading research on youth athlete development has resulted in numerous invited positions and consultancy including the International Olympic Committee (IOC) consensus group on Youth Athlete Development. His research on transformational coaching has been disseminated to organisations around the world including: World Rowing Coaches, Italian Olympic Committee, Swedish Sport Federation, Canadian Sport Institute, Singapore Youth Sport Institute, Canada Soccer Association, Swedish Hockey Federation, and Norway Soccer Association.