

Institution: University of Huddersfield
Unit of Assessment: UoA24 Sport and Exercise Sciences, Leisure and Tourism
<p>1. Unit context and structure, research and impact strategy</p> <p>Overview</p> <p>The discipline of Sport and Exercise Science at the University of Huddersfield is driven by an ambitious programme of research, with a desire and commitment to create knowledge that has a positive impact on health and athletic performance. Our Mission is to foster a spirit of (co)enquiry and partnership for innovation and change, making a difference in organisations, services and communities, locally, nationally and internationally. We are highly collaborative, working closely with colleagues from around the world in order to address important real-world problems.</p> <p>The Unit comprises staff from the Division of Sport, Exercise and Nutrition Sciences which sits within the Department of Allied Health Professions and Sport and Exercise, as part of the School of Human and Health Sciences (referred to as 'School' throughout). This is our first independent submission to the REF and no staff submitted have been part of previous research assessment exercises. Research within the University/School is organised around Institutes and Centres of Research and staff within this Unit are part of the Centre for Applied Research in Health (CARH) and in particular, within the theme Physical Activity for Performance and Health Promotion. The emphasis of the Centre is on applied research which positively impacts health outcomes as well as the quality, effectiveness and efficiency of services. The Centre has strong links with NHS-funded service providers and community organisations, with emphasis on collaborative research that is pertinent to current needs and priorities in health research, such as the ageing population, and the prevalence of obesity and type II diabetes. Whilst CARH is an established University Centre, there is also a Sport, Exercise and Nutrition Sciences Special Interest Research Group (established in 2017). This group is multidisciplinary in nature and staff within the group are predominately interested in factors relating to performance for athletes and promoting physical activity for health promotion and wellbeing.</p> <p>Our aim is to produce research of the highest quality with an emphasis on the application of theoretical perspectives to the real world, the use of innovative methodologies, the critical examination of policy and practice, effective knowledge transfer, public engagement, and professional development. We therefore place emphasis on working collaboratively with research stakeholders including service users and professionals to tackle real-world problems. Our focus is on applied research working with end users, as highlighted by ~45% of our outputs (overall, not just submitted to this exercise) having non-academic co-authors. In Sport and Exercise Science, our staff are looking to find ways to bridging the gap between research and practice, as exemplified by Naughton working as a consultant in high performance sport; Harper publishing an invited commentary on using qualitative methodologies to assess and address practitioner-led research questions (Harper & McCunn (2017); doi.org/10.1123/ijsp.2017-0081) and from a Physical Activity and Health perspective, Lewis and Azevedo being part of a number of networks and initiatives that work closely with external organisations nationally and internationally, and communities and the public to improve health.</p> <p>Research Strategy</p> <p>The University Research Strategy sits immediately beneath the overarching institutional Strategy Map and has a primary vision of excellent research with impact, contributing to important advances in human knowledge and significant improvements to the global quality of life. At the unit level,</p>

since 2014, there has been an expansion of research interests due to increases in staff numbers (see Section 2), identifying and aligning with contemporary research questions, external drivers from policy and practice, and the University requiring all academic staff to enrol on doctoral study programs. In particular, there has been growth in research on team sport performance, physiology, and nutrition, led predominately by **Harper**, **Naughton**, and **Haines**. Research associated with this unit is committed to focusing on two key themes: Physical Activity and Health, and Sport Performance.

Physical Activity and Health: Led by **Lewis**, this theme focuses on improving the health of the general population and those living with from clinical conditions through the use of physical activity and exercise interventions. Research in this theme includes investigating time-efficient exercise interventions (**Haines**), physical activity for breast cancer survivors (**Kipling**), the impact of exercise training interventions on endothelial and angiogenic cell function (**Harris**), novel exercise interventions for older adults (e.g., walking football; **Harper** and **Naughton**), environmental nudges to increase activity levels (**Lewis** and **Eccles**), the development and evaluation of interventions to promote physical activity in children and young people (**Azevedo** and **Horner**), and the mental health of elite athletes (**Lewis**). The developing PGR environment within this theme comprises three PGR students (two PhD and one MRes), with research on exercise for females with polycystic ovary syndrome and increasing physical literacy in children.

Sports Performance: Led by **Harper** and **Naughton**, this theme focuses on research that is applied in nature, addressing key issues in sport. There has been particular attention paid to establishing meaningful relationships with local sports clubs. This has included Memoranda of Understanding with Huddersfield Town Association Football Club and Wakefield Hockey Club. The established and vibrant PGR environment within this theme comprises eight PGR students (five PhD and three MRes) with research in football (soccer and American Football), field hockey and tennis environments, elite level taekwondo, and recovery from exercise in females. Staff within this theme have published research from collaborative projects with professional sports teams, predominately in the areas of physiology, nutrition and biomechanics.

The School support the development and career progression of existing staff (early- and mid-career researchers and emerging and established research leaders) through research training, mentoring and coaching to support research career progression and by actively developing opportunities for staff to gain first-hand experience in research (see Section 2 for further details). Research training is delivered both locally and centrally; there is a clear interface to ensure coordination, consistency and quality. All staff with a significant responsibility for research are allocated time for research within the Workload Allocation Model according to their individual potential contribution to the research function.

Research Impact

Through our research and partnerships, we have been able to achieve significant **impact**. In particular, **Lewis's** work has led to a number of policy and practice changes within the Rugby Football League SuperLeague to welfare provision. As a result, all SuperLeague clubs are now recommended to have a fulltime Player Welfare Manager (PWM). The PWMs are better trained and supported in their own welfare and are able to more fully support the welfare needs of the players. Furthermore, **Harper** and **Naughton** have conducted research with English Premier League academy players that has contributed to changes in the day-to-day practices and wellbeing provision at English Premier League academies. The Unit's two submitted impact case studies (Improving Welfare Support for Professional Rugby League Players and Monitoring Wellness and Mental Fatigue in Soccer: Implications for Recovery Practices and

Psychological Support) align with our commitment to conducting research in team sports and working with end users to create meaningful and impactful research. We strive to conduct all our research in this manner and encourage staff to do so. All staff are required to write strategies for achieving impact when applying for internal funding. Our aim is that all research in our two key themes will continue to have impact; increasing physical activity, improving health, and enhancing sports performance. The Unit's impact strategy is informed by the School strategy. Key tenets of the strategy include:

- Engaging public stakeholders and ensuring our research translates to research users and beneficiaries
- Building meaningful and mutually-beneficial research partnerships
- The co-design of research with end users from the start and working closely with the School's Public Participation Group
- Actively recruiting staff who are known for generating impact beyond academia
- Supporting staff to engage in activities that facilitate the positive impact of research

Research Futures

Physical Activity and Health: Within this theme staff will continue to focus on key research priorities in health. This will include the continuation of research into exercise interventions for older adults, such as walking football and netball (**Harper, Naughton and Lewis**). Furthermore, the use of food and nutrition to improve health outcomes in older adults will also be researched (**Harper, Naughton and Pufal**). **Haines** will continue to identify clinically useful exercise interventions for individuals who are living with or may be at risk of developing type II diabetes. **Lewis and Kipling** will continue to work in the area of physical activity for cancer survivors and **Azevedo and Horner** will continue their work on the development of interventions that promote physical activity and reduce sedentary behaviour in children and young people.

Sports Performance: Within this theme, staff will continue to focus on answering applied questions, working directly with practitioners to address the emerging key areas in sports performance. In particular, we plan to work closely with female athletes. Ongoing research projects include assessing the nutritional knowledge of professional and semi-professional female football players and eating behaviour. We plan to focus on a) improving acute performance; b) accelerating recovery; and c) enhancing athlete health. We aim to set-up collaborative PGR studentship models, which have proved successful elsewhere, to allow collaborative, meaningful and impactful research to be conducted in applied settings. We are aiming for international recognition for our work within team sports, particularly soccer.

Through collaborative development, our strategic **aims** as a Unit for 2021-2026 are:

- 1) Further **increase** and **sustain** overall research activity, particularly of an **interdisciplinary** nature. We will do this by continuing to support and retain current staff (particularly those who are still finishing their doctorates), continue to invest in equipment, facilities and new staff, and capture external grant income to ensure our research activity is sustainable.
- 2) All staff to have **doctorates**. Currently there are three members of staff working towards this, with all other staff (12) already holding a doctorate.
- 3) Grow our **postgraduate research environment**. We will continue to recruit and mentor exceptional undergraduate students who are able to transition to PGR study, including taking advantage of fee waivers and competitive scholarships offered by the University and

the School. We will also aim to set-up a structured programme of collaborative MRes and PhD studentships with external organisations to attract the highest quality PGR students. We will also aim to have all academic members of staff as part of at least one PhD supervisory team.

- 4) Co-produce research in **key public priorities** such as an ageing society, childhood obesity, and prevention/treatment of clinical conditions with research end users and other stakeholders. Support for external grant bids (e.g., NIHR) is available from the wider School of Human and Health Sciences staff who have experience and success, and established collaborations with a number of other research-intensive Universities (e.g., University of Sheffield).
- 5) Work towards transitioning from a Sport, Exercise and Nutrition Sciences Research Group to a Research Centre. We will do this by increasing the number of quality outputs, developing the burgeoning postgraduate researcher environment, capturing funding from external bodies, and continuing to set-up links with established academic institutions in the Sport and Exercise Sciences.
- 6) As part of the wider School and University commitment as a 'Civic' School and University, we will continue to consolidate and establish new local and regional partnerships, both in physical activity and health, and sports performance, to ensure our excellent research has a positive, translational **impact** on our local community. We will also actively seek out opportunities to collaborate with **international** partners.

Research Culture

Research Integrity

The unit and the University as a whole strongly advocate a culture of research integrity, aligning with the Universities UK Concordat for Research Integrity. Furthermore, staff within the Unit (**Harper, Naughton and Haines**) are active members on the School Research Ethics and Integrity Committee and thus contribute to the development of appropriate ethical procedures across the School and the Unit. As a Unit, we ensure that all research conducted meets all ethical and legal guidelines and adheres to GDPR.

Open Research

Staff in the Unit follow the University of Huddersfield Open Access (OA) Policy and School guidance, which supports both Green and Gold routes to achieving OA compliance and ensures maximum reach of research outputs. The University has invested in systems to facilitate Open Research including the Elsevier PURE management information system and a University Data Repository and content management system (Box). Further support is provided by an Open Access Manager and Research Data Management Officer whose roles are to assist in the delivery of mandatory central training for staff and students, support the wider open research strategy and assist academic staff in making data open and accessible.

Staff in the Unit have been encouraged to use the Open Science Framework (OSF) and International prospective register of systematic reviews the international prospective register of systematic reviews (PROSPERO) to pre-register studies/systematic reviews and meta-analyses, as well as use OSF to publicly share associated files such as data used for a meta-analysis and excluded studies. Furthermore, they are encouraged to use OSF as a data repository for the open sharing of research data (within the boundaries of GDPR and participant anonymity). The Unit supports the idea of 'Registered Reports', with studies undergoing an initial peer review prior to

data collection to ensure that research and the subsequent data collected is conducted and analysed in a predetermined manner, therefore preventing hypothesis switching or selective reporting. As more journals in Sport and Exercise Science encourage this practice, staff will engage with this process.

2. People

At the time of writing, our Unit comprises seven Category A staff with submitted outputs (four female, all full-time), including an Acting Head of Department (Allied Health and Sport and Exercise), a Head of Division (Sport, Exercise and Nutrition Sciences), a Research Fellow, a Reader, and three Senior Lecturers. Three members of staff are Early Career Researchers (ECRs), with post-PhD duration of 3.5 ± 1.0 (2-4) years. However, it should be noted that whilst they fit the definition of an ECR, none of the three declared ECR status. We also have a further eight staff within the Unit who were not eligible for submission based on the Code of Practice (four female, five full-time), including three members of staff undertaking PhDs. All staff are under the age of 55, with 43% in the 25-44 category, demonstrating sustainability in progressing the research culture and environment.

Recruitment, retention and staff development

Within the Division there have been seven academic staff appointments since 2014 (with one retirement). Since 2016 in particular, this investment in academic posts has focused on employing promising ECRs who have just completed PhDs or are close to doing so. These appointments comprise: a Senior Lecturer in Sport Psychology (**Ellis**), three Lecturers in Sport and Exercise Physiology/Nutrition (**Fish**, **Harper**, **Naughton**), a Lecturer in Sport Biomechanics (**Hudson**), and a Senior Lecturer in Exercise Science (**Eccles**). Furthermore, a Reader was employed in January 2020 (**Azevedo**) to bolster the Physical Activity and Health theme. Their research focuses on the development and evaluation of interventions to promote physical activity and reduce sedentary behaviour, as well as conducting systematic reviews (including Cochrane reviews). Within the same timeframe **Lewis** has been promoted to Acting Head of Department for Allied Health and Sport and Exercise and **Haines** has been promoted to Head of Division. Furthermore, **Fish**, **Harper**, **Hudson** and **Naughton** have been promoted from Lecturer to Senior Lecturer, demonstrating that the strategy of employing promising and exceptional academics in order to sustain areas of strength is working. This strategy of employing promising ECRs and developing the research skills of present staff through the completion of a PhD has fostered a collegiate environment whereby staff feel a personal investment about the development of research within the Division and that their research does make a difference not only outside academia, but to the Division and the University.

The University has an open and transparent internal promotion procedure, with relevant guidance and documentation available on the Human Resources website. There is an annual call for applications for Principal Research Fellow, Reader and Professor. For newly-appointed staff (and for staff who have recently completed a Doctorate) the School offers a structured induction programme and aspires to: one year of minimal teaching, tailored active research mentoring, the possibility of a start-up financial package for consumables, and priority over PhD scholarship student co-supervision. The School actively encourages the inclusion of post-doctoral positions and PGR studentships in larger grant applications.

Since 2014 there has been a University-wide mandate for staff to hold doctorates. Prior to 2014 there were **no** members of staff with doctorates within the Division, there are now twelve. It is hoped that by January 2023, 100% of staff in the Division will hold doctorates. A number of staff have completed, or are completing, their doctorates part-time alongside full-time teaching

commitments. Support is in place for staff to become research independent following completion of a doctorate. Staff are provided with internal funding for their research, as well as a minimum of one protected day a week. Furthermore, staff have been allowed to take semester-long sabbaticals to focus on writing their PhD thesis. These processes have allowed staff members to conduct research on exercise interventions for breast cancer survivors (**Kipling**), ankle muscle strength (**Fish**), reduced-exertion high-intensity interval training (**Haines**), physical activity interventions for young people in a pupil referral unit (**Horner**), the application of biofeedback in sport (**Ellis**), and engaging children and young people in physical activity (**Lewis**). A member of the Division's technical team is also completing their doctorate part-time and supporting staff with their research. With so many staff now beginning their post-doctoral journey, there is real vitality within the Division and the future is bright for research.

Early Career Researchers within the Division are part of PhD students' supervisory teams (in some cases, principal supervisor alongside an experienced co-supervisor from within the School). The School conducts regular mandatory training for new supervisors, as well as three-yearly refresher sessions. This enhances ECR's skills and future-proofs the Division's ability to support and grow PGR student numbers. Staff members who are ECRs are also involved in important School-wide panels and committees, including the REF Management Committee and School Research and Enterprise Committee, as well as leading the UoA's Research Group. This allows ECRs to acquire invaluable experience and expertise to increase the sustainability of the research environment.

The University adheres to the principles of the UK Concordat to Support the Career Development of Researchers and is committed, as recognised by the European Commission's HR Excellence in Research Award, to the implementation of the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers. Tailored active research mentoring is available to all staff (through the Research Mentoring scheme) and through customised support with specific research activity. All staff, in particular early- and mid-career researchers, are able to access postgraduate research training courses and relevant Masters modules. Sabbatical or study leave is considered on a case-by-case basis in line with University Policy. Staff are encouraged to engage with industry partners, as consultants, or to facilitate knowledge exchange.

The Personal Development and Performance Review process promotes, supports and celebrates excellence in research with an emphasis on researcher development and the establishment and monitoring of ambitious but achievable performance targets around key research functions such as publishing. The School offers extensive provision of support for writing for publication, such as 'Shut Up and Write' sessions, facilitated 'Writing Retreats', writing skills training at different levels ('Getting Off the Blocks' and 'Moving from 2* to 3*') and a structured group coaching programme ('Write Your Paper in 12 Weeks'). These initiatives have contributed to the very significant increase in the volume and quality of research outputs from the UoA in the current REF period.

Research Students

We maintain an active pipeline of excellence from our undergraduate programmes, through our postgraduate taught programmes, to PGR and subsequent academic posts. Pre-conditions to acceptance onto our PGR programmes are a first degree (at least upper second-class honours) and a good relevant master's degree (or equivalent), though exceptional candidates who performed highly in their first degree may be considered without a master's degree. We interview all prospective PGR students and give consideration to their qualifications and previous research experience, the feasibility of their planned project, and their commitment to postgraduate study and research. All project proposals undergo review for significance, rigour, feasibility and fit. Each year the School offer highly competitive fee waivers and scholarships for exceptional candidates.

Two PhD students within the Division were awarded fee waivers during the current REF period. The recruitment of three PGR students has also come from self-funders, under the supervision of **Harper, Naughton** and **Haines**, demonstrating our appeal as a Unit with a strong research culture, especially as one student is also a full-time lecturer at another UK University and one is the Director of Sports Nutrition at the University of North Texas. All staff in the Unit are able to advertise self-funded PhD and MRes opportunities on their institutional webpages to attract potential self-funded students. Since 2014, we have had four PGR graduates (non-staff members, two MRes and two PhD).

The School offers a personalised research training programme to each PGR student via their supervisory team and a coordinated programme of research training which is delivered within the School (discipline-specific training to support the programme) and at University level (generic transferable skills training, to support independence and employability e.g., knowledge exchange, impact and citizen engagement). In common with training for staff, each element of the PGR training is mapped to the Vitae Researcher Development Framework to ensure coverage and to avoid duplication. The School PGR training has recently been revised to offer a wider portfolio of sessions, catering for both novice researchers and those seeking more advanced training in a range of research designs and methods of quantitative and qualitative data collection and analysis. Furthermore, training in research ethics and integrity is compulsory. There is a fortnightly workshop organised by PGRs where staff (internal and external) offer support for various aspects of development, including writing, presenting, research impact, and transitioning in to post-doctoral research/work. We encourage our PhD students to value teaching as well as research, and opportunities are provided for PhD students to contribute to teaching provision, particularly seminar and practical sessions, as well as team-teaching with academic staff. Furthermore, they are encouraged to act as co-supervisor to final year dissertation students to gain experience in supervising research projects.

Participation at national and international conferences is encouraged and supported through the PGR student support fund, which provides additional financial support for project, travel and other costs. Students are eligible for £550 for an international conference during their studies, and £350 for a national conference. They are also provided with up to £150 per year for additional networking and up to £200 a year for research consumables. PGR students are also encouraged to take part in the national Three Minute Thesis competition. Student progress is monitored through monthly supervisory meetings (for full-time students; two-monthly for part-time), with a short report required through an online portal (SkillsForge) where students and supervisors can make comments, identify areas of strength and improvement, and formalise future plans. This is mandatory and students and supervisor(s) have to sign off the final iteration. Annual student progression reviews (or biennial for part-time students) are carried out by academic staff, independently of the supervision team and the University has recently introduced an additional end of year report by supervisor and student for part-time students during years 3 and 5 when a full progress review is not required. PGR student progress is monitored via School Postgraduate Progressions Boards (which meet three times a year) which highlight any anomalies to the School Director of Graduate Education and the relevant Deputy Director with pastoral responsibilities for Sport and Exercise. The world class support and training that PGR students receive is reflected by PRES (2019/20) data that indicates an overall satisfaction of PGRs within the School of 82.8%, above the national average of 80%.

Since 2016, PGR students within the Unit have been encouraged where possible to write their data for publication as they go through their studies. This was not previously the case, with the production of the thesis itself the only focus. This change in culture has led to PGRs publishing

their research early on in their studies, going through the process of peer review and addressing critical feedback from external reviewers. This method is also beneficial for staff and supervisors as they are co-authors on the articles.

All PGR students (and staff) have access to the School and University's excellent pastoral and wellbeing support systems. Each research student also has a named personal tutor and due to the broad range of methodological expertise across the School, our PGR students are able to consult directly with staff who hold identified research expertise. Due to the coronavirus pandemic and the lockdowns and University closures that have ensued, PGR students have received remote support from academic, technical and administrative staff. This has included using video conferencing for meetings and for research training, workshops and seminars.

As a Unit we aim to integrate and absorb research students fully in our research culture. They are members of our Research Group and are invited to all meetings (and encouraged to present their work when appropriate). This provides a safe environment where students can receive feedback and engage with fellow students and staff members. They are also responsible for the administration of the Sport, Exercise and Nutrition Seminar Series (SENS), that received internal funding (£2000). Their role involves identifying external speakers, contacting staff and other PGR students from other Universities to invite them to the talks, and overall co-ordination of the speaker's travel, accommodation and day of the talk. This provides an excellent opportunity for PGR students to develop their communication and networking skills and enhance their external research contacts, forming current and future collaborations in the process. The School ensures meaningful pathways to consultation with PGR students, with PGR student representation both on the School Research and Enterprise Committee and PGR committee, and at University level via Graduate Board and Graduate Council. The School hosts a PGR-led conference called "Engage", and the University hosts a very successful annual postgraduate research conference, with all PGR students encouraged to present their work. At the 2019 conference, PGR students from the Unit had a whole session (four presentations) devoted to their research. In 2020, the steering committee was co-led by a PGR student from the Division. PGR students are encouraged to be involved in staff research projects and this has led to productive collaborations.

Equality and Diversity

Through an Equality Impact Assessment, differences between the Unit as a whole and staff identified as SRR/IR for gender, nationality, ethnicity, disability, sexual orientation, religion, age and marital status were small (all less than 16.5%). Therefore, in the final selection of equivalent quality outputs, we were not required to take specific action to ensure diversity (in line with the University REF Code of Practice). All staff involved in the Unit's decision-making for REF2021 have completed REF-specific Equality and Diversity training. By strictly following the University's Code of Practice, the output selection for this submission was guided by internal and external peer review by experts in the discipline; ensuring that less than 5% of outputs were non-OA compliant; and that the outputs aligned with the Research Strategy and Futures detailed above.

All new staff recruits are required to undertake training on diversity and on unconscious bias. The School monitors recruitment and promotions data annually by protected characteristics and any resulting trends or anomalies are highlighted for action. The School is committed to equality and to increasing diversity at all levels, and taking positive action to maximise the chances of recruiting, promoting and allocating the best person for any particular role. School staffing policies support flexible working, career breaks and part-time working with accommodation of carers' responsibilities whenever practicable. Future academic vacancies will be advertised as suitable for job share, part-time or flexible working, in order to enable a balance of work and home

requirements. The duties of those on parental leave are fully covered (also for some time after return, with accommodation of the needs of breastfeeding mothers).

The School subscribes to, or actively aspires to joining a range of external equality and diversity initiatives, either at University level or at School level, in order to guide and sustain best practice:

- The University participates in 'Every Researcher Counts' to improve equality and diversity for researchers in HE
- The University has an implementation plan that aligns with the Concordat to Support the Career Development of Researchers, the European Charter for Researchers and Code of Conduct for their Recruitment, UK Quality Code for HE, and the Vitae Researcher Development Framework
- The University is recognised as a Disability Confident Employer at Level 2, which covers the themes "Getting the right people for your business" and "Keeping and developing your people"
- The University has received the organisational Athena Swan Bronze Award and the School is working towards a departmental award
- The University is a Stonewall Diversity Champion member
- The University Equality, Diversity and Inclusion Enhancement Committee leads the development and implementation of University EDI policies, framework and schemes, identifies areas for enhancement through dialogue with the University Research Committee and provides a forum for discussion and oversight relating to REF.

The University's Black, Asian & Minority Ethnic (BAME) Staff Network represents the views of staff working at the University of Huddersfield who self-define as BAME, and supports the School's shared commitment to systemic change. The School has also recently appointed a dedicated Director of Equality, Diversity and Inclusion. There is commitment to enabling leadership potential and target support particularly at under-represented groups. For example, the University partners with AdvanceHE's Aurora development programme for people who identify as women. **Lewis** has taken part in the Aurora development programme, as well as the Chartered Management Institute Level 7 award in strategic management and leadership (CMgr). This is part of a wider University initiative for University managers to become CMgr. This has provided the Department and the UoA with best practice leadership and management behaviour thereby ensuring that staff have the necessary knowledge and the skills to manage research effectively.

Research investment

The School returns a proportion of research overheads back to the Research Centre for fair and transparent re-investment through an agreed unified approach to distribution. Competitive funding (up to £5000 per project) is available to all academic staff within the School for staff development and strategic research investment (and post-doctoral researchers). This includes an annual round of competitive seed funding (which was supplemented by a COVID-19 rapid response fund in 2020), with positive action to encourage applications from early- and mid-career researchers. Staff within the Unit (**Harper, Lewis, Naughton, Horner** and **Haines**) have been successful in obtaining this competitive funding, which has led to research and publications on walking football, extra-time in football, and the Special Olympics World Games. The University also provides additional support for internationalisation of research. **Harper** was successful in obtaining this funding for a research trip to Australia in February and March 2019, and **Azevedo** was awarded £3400 for a project related to physical activity during the COVID-19 pandemic. **Lewis** has been successful in

gaining University 'Collaborative Venture Funding' to further collaborative work with the local council.

3. Income, infrastructure and facilities

Income

This is a newly established research grouping, which contains predominately ECRs, many of whom only obtained their doctorates after 2016. Therefore, it has only been since 2017 that the majority of staff have actively started to bid for external funding. Staff have applied for funding from organisations such as National Institute for Health Research (NIHR; **Lewis** and **Azevedo**), Nuffield Foundation (**Azevedo**), Sport England (**Lewis, Harper, Naughton**), UEFA (**Harper**), FIFA (**Harper**), British Association of Sport and Exercise Sciences (BASES; **Haines** and **Harper**), The Borrow Foundation (**Azevedo**), Research England – Strategic Priorities Fund (**Azevedo** and **Horner**), Comic Relief (**Lewis** and **Horner**), Physiological Society (**Harper**), HTA (**Lewis**), Defence Science and Technology Laboratory (**Harper, Haines, Hudson** and **Naughton**). The latter bid was in collaboration with colleagues from the Division of Psychology in the School.

Strategies for generating future income

Acknowledging the size of the unit and the research career stages of staff members there will be a staged approach to bidding activity, with staff applying for smaller grants such as those provided annually by charities (e.g., British Lung Foundation, Age UK, Diabetes UK etc.), UEFA, FIFA, and the Physiological Society, whilst collaborating with experienced members of staff within the School (and other more prestigious institutions) for bids to the NIHR Research for Patient Benefit Scheme for physical activity and health projects. **Lewis** and **Azevedo** have both been successful co-investigators on grant bids to NIHR and we will continue to apply for larger grants to support our research in physical activity and public health. Through staff connections and collaborations with professional sport teams (see Section 4), there is a drive to set-up collaborative postgraduate studentship models. We plan to conduct funded research with nutrition companies, particularly related to enhancing performance and recovery in team sport athletes. Staff within the Unit are also cognisant of Government 'Grand Challenges', particularly the 'Ageing Society' challenge. Indeed, **Harper** and **Naughton** were awarded £8000 at an internal sandpit event to conduct research on the efficacy of pomegranate juice for cognitive function with older adults, in collaboration with colleagues from the School of Applied Sciences. Therefore, funding from the British Society for Research on Ageing, MRC and BBSRC (food, nutrition and health is a key priority) will be applied for. Furthermore, businesses, locally and nationally will be approached to set-up Knowledge Transfer Partnerships (KTP). There is a KTP manager within the University Research and Enterprise team, and a Business Development Manager within the School who assists in the identification of bidding opportunities.

Infrastructure, Facilities and Equipment

We have a strong social infrastructure within the Unit. This allows for the development of interpersonal relationships between staff and students, both postgraduate and undergraduate alike. Whilst the COVID-19 pandemic has meant our social meetings have been confined to video conferencing, prior to this we ensured that our regular journal club meetings and seminar series events included the opportunity for informal conversation both before and after the meeting, with food and refreshments available. This facilitated unscheduled discussions both among colleagues and any external guests that were present. As a Unit we value these moments as opportunities for the seeds of research ideas to be planted.

The Division has three laboratories for teaching and research (Physiology/Human Performance (2) and Biomechanics). Furthermore, there is access to the University's Sports Centre Sports Hall

and Studios. Since 2014 there has been capital investment of approximately £325,000 for equipment for research within the Unit. The laboratories are serviced and supported by two full-time technicians, one of whom is also a PGR student within the Division. PGR students are provided with dedicated shared office space with workstations, storage for personal belongings, quiet areas, an interview/meeting room with data projection facilities, two rooms for private study, a kitchen area and an adjacent relaxation room. PGR students also have access to free printing. Viva voce examinations are conducted whenever possible in the familiar School research meeting room. The School provides dedicated administrative support for the PGR function in addition to any central support from the Graduate School.

Physiology/Human Performance Laboratories

The Physiology and Human Performance Laboratories are equipped with two treadmills (including a h/p/cosmos with Airwalk for unweighting and balance training). This was purchased in 2016 (£30,215). This purchase helped forge a relationship with Huddersfield Town AFC first team, for use for physiological testing of their players across a season. This has provided a small income to support research consumable purchases. The laboratories also contain 10 Monark ergometers, two Concept2 Model D Rowing Machines, and a Velotron system. The Velotron was purchased in 2017 (£8920). The laboratories contain two Cortex Metamax 3B systems for respiratory gas exchange measurements, both within and out with the laboratory. Both systems have been purchased since 2014 (£54,642). Within the laboratories there are 12 desktop PC's all with Dartfish TeamPro Software (all purchased in 2017; £32,346), as well as a Biosen C Line Glucose and Lactate Analyser, two portable OptoJump systems and a FixxXL NeXus-10 bio and neurofeedback system, all purchased in 2017 and 2018; £24,048).

Biomechanics Laboratory

The Biomechanics Laboratory is equipped with a Simi Reality Motion Systems 8 camera system for kinematic and kinetic analysis of movement (purchased 2018; £51,372), a force plate (Kistler), and a portable EMG system (Delsys Trigno Avanti Research+. purchased 2018; £14,208). There is also a Biodex isokinetic dynamometer which has been used by **Fish** and **Haines** for research and testing with professional sports teams. The recent investment in the Biomechanics Laboratory has coincided with the appointment of a new Lecturer (now Senior Lecturer) in Sports Biomechanics (**Hudson**).

Through capital investment awarded in late 2020, the following equipment will be purchased in early 2021: Sportcode Performance Analysis software and necessary Apple hardware, another h/p treadmill, IMeasureU Step lower limb monitoring sensors, Kistler force plate, Lode ergometer, a SIMI Motion capture system, and a new research-only gas analysis system. All of this equipment will further enhance our research capabilities and emphasises the sustainability of our research environment. The laboratories will also be moving to another building on the University campus in 2021 that will increase the amount of space available and allow for the implementation of facilities such as a running track and lifting platforms to support strength and conditioning, biomechanics, physiology, nutrition and metabolism research.

The School was recently awarded £45 million of investment from the University for the construction of a new building, as well as further investment for facilities that will support research in the Unit. This will form part of a new National Health Innovation Campus, which is to be led by the University.

Structures and Systems

The School provides systems and processes that support research such as:

- the PURE research management information system and repository
- the Peer Review of Research Applications Management System for the (mandatory) internal peer review of research bids
- Microsoft Dynamics for contact management
- Pre-Award/Post-Award (PAPA) and Agresso for financial information
- SkillsForge for keeping contemporaneous notes of PGR supervision meetings, training and development opportunities, and an area for students to complete a Research Skills self-assessment based on the Researcher Development Framework

A number of groups and committees help to drive, monitor and coordinate research activity:

- The School Research and Enterprise Committee (SREC) reports into the School Management Team (SMT) and the University Research and Enterprise Committee and is responsible for interpreting central policies, procedures and guidance into the School and for delivering the School research strategy. **Lewis** and **Azevedo** are on the committee, and there is representation from PGRs.
- The School Research and Ethics and Integrity Committee (SREIC) reports into SREC and the University Research Ethics and Integrity Committee and is responsible for delivering good research governance across the School. All research activity in the School requires consideration by SREIC. **Harper**, **Naughton** and **Haines** are on Panel and so staff within the Unit are kept up-to-date with current guidance.
- The Postgraduate Research Committee reports into SREC and is responsible for delivering the School PGR function.
- The REF Management Group reports into SREC and is responsible for delivering on the School REF agenda. **Lewis** and **Harper** are members of the group.
- The School has a defined Impact Strategy and employs Senior Research Fellows who, as part of their role, act as Impact Champions, leading Impact-related activities and supporting staff with collecting and evidencing impact. Furthermore, the School has two co-Directors of External Engagement, and they provide regular updates at Research Group meetings on ways to achieve impact.

Professional services staff within the School play a key role in:

- Bid development and management
 - Delivering training and advice on grant writing
 - Providing tailored end-to-end bidding support, including personalised support for fellowship awards
 - Maintaining a library of previous bids and sourcing 'boilerplate' information
- Research intelligence
 - Disseminating and targeting timely alerts to funding opportunities (e.g. internal and external, responsive and speculative, national and international)
 - Coordinating the development of strategic large-scale grant applications
 - Advising on funding body's terms and conditions.

There is significant School and University level support for the Unit's ECRs who are enhancing their research profiles within the Sport and Exercise Science discipline. There are yearly calls for capital investment bids for equipment that can be utilised in research, making staff more attractive to external funders and collaborators. The money available for conferences allows staff to present their research on international platforms. Contemporary research and relevant information are shared across the research community via email and monthly Journal Club meetings (which PGR students are invited to). Indeed, PGR students are encouraged to present new journal articles relevant to their research to the rest of the Unit with critical insight. With continued investment there will be increased vitality and sustainability and a continual development of the research culture within the Unit.

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

The unit is committed to collaborative, interdisciplinary research that is international, national and local, working closely with other academic institutions, businesses and organisations. Examples of academic collaborations include with Liverpool John Moores University (best overall profile in REF2014 for UoA 26 (now 24), **Naughton**), University of Cambridge (QS7, **Azevedo**), University College London (QS10, **Azevedo**), Universidade de Sao Paulo (QS115, **Azevedo**), University of Technology Sydney (QS133, **Harper**), Loughborough University (QS Top University in the world for Sport-Related Studies, **Naughton and Harper**), KU Leuven (QS84, **Hudson**), and University of York (QS150, **Harris**). These collaborations have led to research outputs and grant applications. The Unit's publications have co-authors from more than 50 academic institutions (including 25+ international), and 25+ from beyond academia.

The Unit has memoranda of understanding (MoU) with Huddersfield Town Association Football Club (HTAFC) and Wakefield Hockey Club. The MoU with HTAFC has led to two PGR collaborations in nutrition and training prescription and has laid a foundation for future funded studentships. Furthermore, within the assessment period staff have conducted or are conducting research with the following sports teams and institutions: Liverpool FC, Brighton and Hove Albion FC, Sunderland AFC, Barnsley FC, ASPETAR, Southampton FC, English Premier League, Schalke 04 FC, Huddersfield Giants RLFC, Celtic FC, ORIAM and Heart of Midlothian FC. These partnerships and collaborations have been set-up and designed to mutually answer important research questions in Sport Science for Team Sports. Staff have also collaborated and continue to collaborate with the following organisations and initiatives: World Health Organization (**Lewis** contributed to a workshop on cross-cutting approaches to health promotion in health care), Public Health England, Mid Yorkshire Hospitals NHS Trust, Calderdale and Huddersfield NHS Foundation Trust, NIHR Devices for Dignity MedTech Co-operative, Kirklees Council and West Yorkshire Sport. **Lewis** also contributed to a scientific consensus meeting in 2018 on updating the UK CMO 2011 physical activity guidelines. Staff (**Naughton, Haines, Ellis, Hudson, Fish, Harper**) have also provided consultancy and scientific support over the assessment period to a number of sports teams (Celtic FC, Liverpool FC, Huddersfield Town AFC, Huddersfield Giants RLFC, Leeds Rhinos RLFC, Hull RLFC, Halifax RLFC, Bradford Bulls RLFC, Halifax FC and Rochdale FC), the British American Football Association, and international level and professional boxers, runners, golfers, cyclists, swimmers.

Since 2014, staff within the unit have given over 25 invited presentations (both to academic and non-academic audiences), chaired four conference sessions and presented 36 conference papers nationally and internationally. **Hudson** and **Fish** organised the BASES Biomechanics Interest Group annual meeting that was held on the University campus in April 2019, with over 100 delegates in attendance. In February 2020 BASES announced that their annual student conference will be held at the University of Huddersfield in 2021 (now moved to 2022 due to the

COVID-19 pandemic), following an application led by **Fish, Harper and Naughton**. Staff have written articles for professional body magazines, blogs, online media outlets, and national newspapers, including BASES Sport and Exercise Scientist magazine (**Lewis, Harper, Haines**), The Conversation (**Haines and Lewis**), Cycling Weekly (**Haines**), British Journal of Sports Medicine Blog (**Harper**), The Guardian (**Ellis**) and The Telegraph (**Ellis**).

Lewis is a Fellow of BASES and on the Editorial Board for the BASES Sport and Exercise Scientist magazine and is one of the founders of the Yorkshire and Humber Physical Activity Exchange (YoHPAKE), an organisation whose aim is to bridge the gap between research and practice in physical activity and sport. This involves collaboration with other academic institutions (e.g., Leeds Beckett University) and Public Health England. The annual YoHPAKE conference was held at the University in January 2019, with over 100 delegates in attendance. **Lewis** is also an Executive Board member of Everybody Active and Kirklees Active Schools, a member of the Project Active Yorkshire Steering Group, and part of a HEPA Europe working group for children and young people (Health Enhancing Physical Activity; which the University is a member of). **Hudson** was on the BASES Biomechanics and Motor Behaviour Division Committee from 2017-2019, and a PhD student, **Noblett**, is the student representative on the BASES Sport and Performance Division Committee.

All staff are Fellows of the Higher Education Academy, four (**Harper, Lewis, Haines and Ellis**) are BASES Accredited Sport and Exercise Scientists, one (**Harper**) is a Sport and Exercise Nutrition Register (SENr) Academic Associate, one (**Naughton**) is a SENr nutritionist, one (**Kipling**) is a British Association For Cardiovascular Prevention and Rehabilitation (BACPR) exercise professional who is a tutor for Level 4 Cancer and Exercise Rehabilitation courses, and one (**Ellis**) holds certification approved by the American Psychological Association on biofeedback and neurofeedback. Staff are members of key organisations in the field including BASES, American College of Sports Medicine, European College of Sport Science, British Dietetics Association, Nutrition Society, and the International Society of Biomechanics.

In the assessment period three members of staff (**Naughton, Ellis and Harper**) have written invited book chapters in Reflective practice in the sport and exercise sciences: Contemporary issues, Knowles et al. (Eds.) 2014, Routledge; Global practices and training in applied sport, exercise, and performance psychology: A case study approach, Cremades & Tashman (Eds.) 2016, Psychology Press, and Elite soccer players: maximizing performance and safety, Curtis et al. (Eds.) 2019, Taylor and Francis respectively. **Azevedo** has externally examined one PhD thesis (Leeds Beckett University) and was the winner of the Community Partnership Award at the 10th Nouveau Anniversary for her Bump to Buggy project (November, 2018). **Harper** has externally examined three PGR theses at Edge Hill University (2016), University of West of Scotland (2017) and La Trobe University, Australia (2020), and was awarded second place in the Young Investigator Award at the International Science and Football Association annual conference in Doha, Qatar in 2016.

All staff actively peer review for journals in the field, including but not limited to: Medicine and Science in Sport and Exercise, Sports Medicine, International Journal of Sports Physiology and Performance, International Journal of Obesity, International Journal of Behavioural Nutrition and Physical Activity, International Journal of Sports Nutrition and Exercise Metabolism, and Scandinavian Journal of Medicine and Science in Sports. Furthermore, **Harper** has been a Section Editor for Biology of Sport since July 2020. Staff have also reviewed grants for funding bodies (Physiological Society – **Harris** and Breast Cancer Now – **Lewis**).

The unit set up a Sport, Exercise and Nutrition Seminar Series (SENSS) in February 2019 that received competitive internal funding and is run by two PhD students supervised by **Harper, Haines** and **Naughton**. Internationally acclaimed academics from other academic institutions (e.g., Newcastle University and Swansea University) have spoken on a range of interdisciplinary topics within the Sport and Exercise Sciences. SENSS is marketed to the general public and staff and students from other local academic institutions to foster further collaborations and engagement with research end users.

This is the first submission for Unit 24 at the University of Huddersfield and is born out of a robust research environment that fosters development, facilitates discovery, stimulates growth and encourages excellence. The research culture is vibrant and has a positive forward trajectory, with academic staff who aim to make an impact on the research base, and the economy and society at local, national and international level.