

Institution: Plymouth Marjon University
Unit of Assessment: 24 Sport and Exercise Sciences, Leisure and Tourism
<p>1. Unit context and structure, research and impact strategy</p> <p>1.1 Marjon has a growing International reputation for research and knowledge exchange related to sport and exercise sciences, leisure and tourism. This submitting unit consists of 14.0 FTEs, comprising 17 members of staff who are employed to undertake teaching and research. While this is our first REF submission, unit members have strived collectively, to fulfil the institution's vision of building an impactful, influential and sustainable research culture, placing our values of humanity, ambition, curiosity and independence at the centre of how we operate.</p> <p>1.2 Marjon research strategy (2015-2020) identified five key strategic drivers (see REF5a, paragraph 7). Significant and sustained achievement against these strategic drivers at unit level includes high quality research outputs, collaborations and networks as well as other indicators of International esteem, see paragraphs 1.5 to 1.9.</p> <p>1.3 Members of this unit are located within the School of Sport, Health and Wellbeing. Four interdisciplinary research clusters, formed in 2017, supported a deliberate step change in the research environment at Marjon (see paragraph 1.3a to 1.3d). The research clusters have supported a critical mass of research active staff to produce internationally excellent research around thematic topics, alongside a network of collaborations and partnerships that have grown our reputation regionally, nationally and internationally. Exemplar successes are summarised in relation to the research strategic objectives in paragraph 1.5 to 1.9.</p> <ul style="list-style-type: none"> a. The exercise medicine and wellbeing research cluster (EMpoWER) has focused on application of the sport, exercise and health sciences to wellbeing. Submitted staff in the cluster are Professors Bloxham, Dawson and Hyland and early career researchers (ECR, Downey, Jane). b. The experimental myology and integrative physiology research cluster (EM&I Phys) has focused on environmental physiology applied to occupational, health and performance contexts. Submitted staff in the cluster are emerging researcher Layden and ECR Westwood. c. The rehabilitation and performance research cluster (REAP) has focused on the application of the sport and exercise sciences to injury prevention and rehabilitation and to sports performance at all levels of participation/performance. Submitted staff in the cluster are Professor Shum and Jones, emerging researchers (McCormick, Walter-Symons) and ECRs (Choy, Coyle). d. The sustainable sport and leisure development (SSLD) has focused on application of social sciences to the development and sustainability of sport and leisure. Submitted staff in the cluster are experienced researcher Beacom, emerging researcher (Gibson) and ECRs (Brown, Stonebridge). <p>1.4 Through the research clusters the unit has sought to proactively solve real-world problems in sport and exercise, leisure and tourism through collaboration, to develop impactful, applicable solutions. The strength of the unit has been utilising multi- and interdisciplinary research approaches, underpinned by the sport and exercise sciences, to seek solutions suitable for the applied context. To reinforce the value of this approach, our research has informed and facilitated improvements in national policy and practice at organisational level. Our unit members achieve this by developing, designing and evaluating innovative methodology and methods, and by applying and influencing theoretical frameworks.</p>

Achievements Against the Research Strategic Aims

- 1.5 *Research strategy aim 1: To establish a reputation for research excellence.* Since 2013 the unit has focused on developing an inclusive and vibrant research environment in line with our values. This has been driven by the Research and Knowledge Exchange committee, with membership from the academic community, including unit members. Marjon have invested £1.29 million in centralised support through the Research and Knowledge Exchange Office, PhD studentships, staff, and facilities (see REF5a, paragraph 23). These activities and initiatives have supported the unit in maximising the International reach of research. Indicators of esteem in relation to research excellence include examples outlined in paragraph 1.5a to 1.5b.
- a. Members of the unit have contributed to and collaborated with partners to influence policy and practice regionally, nationally, and internationally. For example, from SSLD, Beacom's specialism within disability sport enabled engagement with commissioned research for the Invictus Games Foundation (2016) and informed his role as Member of the IOC review panel (2014/15 and 2016/17). Gibson co-authored the BASES Expert Statement on Mental Health Literacy in Elite Sport (2019) and his research informed the IOC consensus statement on Mental Health in Elite Athletes.
 - b. Members of the unit have contributed to editorial boards, delivered invited keynotes, and have actively contributed to learned organisations. For example, from REAP, Professor Shum has been on the editorial board of Journal of Spine, Archives of Sports Medicine and Physiotherapy and has delivered invited keynote lectures at The Hong Kong Polytechnic. Professor Shum is also Honorary Professor of the Royal Devon and Exeter NHS Foundation Trust. Emerging researcher McCormick has informed a network of researchers from universities across the UK and internationally as part of the RESIST working group with his applied sport psychology research (Research-evaluated Endurance Strategies Intending to Support Training).
- 1.6 *Research strategy aim 2: increase and continually improve research outputs in both number and quality.* There are strong indicators of success in terms of number and quality of research outputs alongside the number of staff with research outputs over the assessment period, see paragraph 1.6a to 1.6c.
- a. The staff submitted to the unit have published 194 outputs in the open access [Marjon Research Repository](#). This is an average of two outputs per year per FTE over the assessment period, which is productive in the context of a teaching led/research informed university. Outputs per annum increased threefold from the start to end of the assessment period, demonstrating the unit's positive trajectory in research capacity building (e.g. 2013-2015, 11 outputs per annum versus 2016-2020, 32 outputs per annum).
 - b. Unit preparations for the REF submission, following the processes in the code of practice, identified 80 research outputs which formed the UoA24 output pool. Each of these has been assessed against published criteria for rigour, originality and significance through an internal and independent external review process. Through this rigorous process over 90% of the outputs were judged to have qualities aligned to the criteria for 'internationally recognised' outputs, with nearly half demonstrating qualities aligned to the 'internationally excellent' criteria or above.
 - c. Impact factors have not been analysed or reported since the unit has committed to the principles of the [DORA](#). It is appropriate to note 96% of the output pool were published in established journals with rigorous peer review processes. Additionally, two thirds of the research outputs in the output pool were published in high-quality, often world leading, Q1 journals. For instance, from i) EMpoWER published outputs in *Journal of Health and Social Behaviour* (Dawson), *European Journal of Applied Physiology*

(Bloxham), *Scandinavian Journal of Medicine and Science in Sports* (Downey), HTA Journal Series (Jane) and *European Respiratory Journal* (Hyland); ii) EM&I Phys have published outputs in *Physiology and Behaviour* (McCormick) and *Nutrients* (Layden and Westwood); iii) REAP have published outputs in *American Journal of Sports Medicine* (Shum), *British Journal of Sports Medicine* (Jones), *European Spine Journal* (Choy) and *European Journal of Sport Science* (Walters-Symons); iv) SSLD have published outputs in *Sport in Society* (Gibson), *Journal of Sport and Social Issues* (Beacom) *Physical Education and Sport Pedagogy* (Stonebridge) and *International Journal of Sport Policy* (Brown).

1.7 **Research strategy aim 3: Achieve maximal societal impact for our research:** Societal impact is an important strategic driver for the unit, aligning to our value of humanity. The approach to societal impact is built upon partnership, public and community engagement and our University civic commitments (see REF5a, paragraph 9). Collaboration with organisations regionally, nationally, and Internationally underpin much of this activity and is reported within the Knowledge Exchange Framework submission. The unit have embodied the philosophy of engaging with the whole of our community, including students, staff, alumni, public, key stakeholders, and peers to help us co-create knowledge, to question our knowledge and to ensure it is shared in meaningful ways. Some of the more sustained research activity of the unit were selected to feature in the submitted impact case studies (see paragraph 1.7a and 1.7b).

- a. A significant success of EMpoWER has been to inform and design new wellbeing services to deliver improvement in community settings and clinical practice. Marjon hosts over fifteen health and wellbeing clinics for patients with long-term conditions, which focus on person-centred care. The approach, involving collaboration with partners, has resulted in social, economic and health improvements for local and regional communities as featured in the impact case study 'Marjon Health & Wellbeing: A new approach to enable the self-management and prevention of long-term conditions in the community' (see REF3). Unit members continue to work with providers of health, wellbeing, and social care, e.g., the Devon Clinical Commissioning Group, Plymouth NHS Hospital Trust, Devon Doctors, Sentinel Health Care and charitable organisations, such as Macmillan Cancer (Bloxham, Dawson, Downey, Hyland, Jane).
- b. Supporting the performance, health, and mental wellbeing of athletes across a range of sports and enhancing enjoyment and resilience at all levels of participation has been a focus of REAP. The '*Enjoyable and Injury-Free Running: Evidence-Based Support for Recreational Endurance Runners*' (see REF3) draws together psychology informed interventions for instance through delivery of mental preparation workshops and 'Psyching Team' support at 5k, 10k and half marathon events (McCormick, Coyle) alongside biomechanical support including gait retraining workshops and injury clinics (Shum, Choy).

1.8 **Research strategy aim 4: Develop an enviable network of external collaboration:** There is good evidence of a strong network of external collaboration with practitioners, private and public-sector organisations, and other research institutions across the unit (see paragraph 1.8a to 1.8c). External collaboration has been driven by the research clusters, knowledge exchange activity alongside individual researcher networks. Visiting professors have also contributed to the growing network and enrich the research environment (see paragraph 2.4).

- a. Marjon secured a research grant from EU Research and Innovation programme, Horizon 2020 - Marie Skłodowska-Curie Research and Innovation Staff Exchange (Project title: [Muscle stress relief: an integrated research program linking together basic research on secondary myopathies in stress states to innovative translation in applied myology](#)). Marjon is part of a consortium consists of twenty partners, receiving a total contribution of €1,458,000 from European Union (Plymouth Marjon University:

£117,519.00). This research grant enabled us to host external researchers and to send our staff to undertake international research with our academic, industrial and commercial partners.

- b. Analysis of outputs of the unit in the repository reveals 165 repository outputs (88%) have been co-authored with academics from HEIs across the UK and Internationally (e.g., the University of Calgary, The Hong Kong Polytechnic University, The University of Toronto, James Cook University, University of Western Sydney, Texas A&M University).
- c. Unit members collaborate with partners outside of academia to identify real world problems, draw on professional expertise and co-create new knowledge; 20% of the research outputs published by the unit during the assessment period have involved co-authored outputs with those outside academia. For example, collaborators have included: UKactive Research Institute (Jones); Mustard Tree Macmillan Cancer Support Centre, Plymouth Hospital Trust (Bloxham, Layden, Jane); Australian Institute of Sport (Edwards); Royal Cornwall and Plymouth Hospitals NHS Trust (Edwards, Bloxham, Karatzaferi, Sakkas); Institute of Naval Medicine (Layden, Westwood), Moor Instruments (Layden, Bloxham) and Livewell Southwest (Shum, Choy).

- 1.9 *Research strategy aim 5: Become a supportive generator of and magnet for world-class researchers:* We have strategically and deliberately invested significantly in the development of unit staff and recruitment of new team members to support the sustainability of a vibrant research environment. This support has achieved a fourfold increase in the number of staff with a significant responsibility for research from 3 FTE in 2013 to 14.0 FTE in 2020. Unit members include experienced researchers submitted to previous research assessments (e.g., Beacom, Dawson, Hyland, Jones, Shum) alongside members who are being submitted to their first exercise.

Research Integrity, Culture and Ethical Standards

- 1.10 Marjon values sound learning, new discovery, and the pursuit of wisdom for the good of all. Unit members are guided by the need to conduct research and their behaviours to the highest ethical standards. This is expected at all levels of decision making, especially considering how these decisions might affect others and the natural world. The code of conduct for research and knowledge exchange outlines the expectations. As members of representative organisations, including Guild HE Research and Cathedrals Group Research and Enterprise Group, BASES, and CIMSPA we are supported to ensure we stay up to date with key policy agendas.
- 1.11 The unit and its research are guided by the Marjon Research Ethics Panel's policy and code of conduct. This panel is committed to supporting the development of research which is original and leads to the creation or gaining of new knowledge and understanding. Marjon's ethical procedures align with the core values, ideas and five commitments set out in the Concordat for Research Integrity. The Chair of the panel (Gibson) is a member of the submitting unit and supports us to ensure our research environment and all aspects of research are 'ethically, legally and professionally informed'. Gibson is also Vice-Chair for the Health Research Authority, National Research Ethics Service and NHS South West Research Ethics Committee.
- 1.12 Marjon is committed to open access research demonstrating our dedication to collaboration and commitment to providing open access to improve knowledge-exchange. Outputs from the unit are deposited in Marjon Research Repository. Analysis identifies that outputs from unit members have been accessed over 1000 times during the assessment period from the repository e.g., McCormick 3312 downloads, Beacom 1377 downloads, Jones 1170 downloads and Bloxham 1069 downloads.

- 1.13 The submitting unit aims to meet the expectations of the Open Science Framework (see REF51, paragraph 12). We are working towards the ambitions in the concordat on open research data and are exploring open data repositories. In line with our values, we are committed to ensure all research is conducted with the highest standards of rigour and integrity. The unit has made progress towards this for instance pre-registering clinical trials (Choy, Jane, Shum) and systematic reviews (Downey, Jones).

Aims for the next five years 2020-2025

- 1.14 A revised research and knowledge exchange strategy, '*Building Knowledge Together*' (2020-25) was recently approved (see REF5a paragraph 8). This revised university level strategy builds upon the significant strengths and achievements at unit level where applied research, built through collaborative partnerships, has grown and led to impactful internationally excellent research. This revised strategy reinforces the priority for the unit to sustain growth in interdisciplinary research activities, knowledge exchange and impact.
- 1.15 In line with the revised strategy, and informed by key stakeholders, the research clusters were reviewed and restructured during 2019-20. Two new research and knowledge exchange groups will sustain growth into the next research assessment aiming to enhance multi and interdisciplinary collaboration between unit members and to strengthen links with partners, to support impactful and high-quality research (see paragraph 1.15a to 1.5b).
- a. The Lifelong Health and Wellbeing research and knowledge exchange group, led by Professors Bloxham and Dawson, builds upon the successes of EMpoWER and is informed by collaborative partners as well as regional and National health needs. This group is thematically based around ageing well, self-management of long term mental and physical health conditions, physical activity for health promotion, patient safety and effective management of health and social care transitions.
 - b. The Resilience and Human Performance group, led by Professors Jones and Shum, draws together expertise from EM&I Phys and SSLD. This group address themes pertaining to resilience and performance in occupational and sport settings and covers themes such as the acute and chronic physical and mental strain, interventions to enhance resilience and human performance and exploration of social and cultural contexts that impact on policy and practice.
- 1.16 The strategic headlines applied to the unit priorities for the next five years are summarised in paragraph 1.16a to 1.16d (see REF5a paragraph 8).
- a. *Humanity, building knowledge capacity inclusively across our community including students and the public, built on trust and integrity.* The unit will continue to recruit, attract and develop ECRs and emerging researchers. We will continue to offer strong mentorship from research leaders aligned to the new research and knowledge exchange groups.
 - b. *Ambition, working in partnership to empower our community to be the best we can be, enhance decision making and promote our knowledge capacity.* The unit will increase the quality of research outputs supporting colleagues through the research and knowledge exchange groups. We will continue to grow our PGR community and have demonstrable PhD completions supporting the university's ambition for RDAP.
 - c. *Curiosity, stimulating debate and discussion to develop questions, establish new insights and encourage innovation.* The unit will continue to adopt principles of open science improving the transparency and rigour of our research. Our research methodological expertise will continue to push boundaries in the field and will support academic engagement in policy and practice.

- d. *Independence, exploring what we can contribute individually and in partnership, appreciating we can all make a difference in the world.* Driven by our research and knowledge exchange groups the unit will continue to work in partnership through public and community engagement and knowledge exchange to meet our civic commitments and ensure societal impact from our research.

2. People

- 2.1 As outlined in paragraph 1.1 the unit comprises of 17 staff members; 12 are full-time and five part-time. This is 54% of REF eligible academic staff at the census date from the subject centre 'Sport'. There are five professors (Bloxham, Dawson, Hyland, Jones, Shum), one associate professor (Gibson), seven senior lecturers (Beacom, Brown, Coyle, Jane, Layden, McCormick, Westwood) and four lecturers (Choy, Downey, Stonebridge, Walter-Symons). Some colleagues provided a meaningful contribution to the unit during the REF assessment period but were not employed at Marjon at the staff census point (e.g., Edwards, Karatzaferi, Sakkas).
- 2.2 Professional development and support for staff has been a key commitment of the university and submitting unit (see paragraphs 2.7 to 2.10). The philosophy of the unit is that enabling knowledge exchange and strengthening research capabilities of all staff will escalate the vibrancy of the research environment. It is this commitment to developing a vibrant, inclusive, and forward-thinking research culture, incorporating PGR students, ECRs and emerging researchers alongside established research leaders which provides the foundations upon which the International reach of research has excelled, and which lay strong foundations for sustained vibrancy of the research environment.

Staffing Strategy and People Management

- 2.3 The overarching staffing strategy of the unit has been to focus on the recruitment of emerging researchers who have not yet submitted to a REF but have established post-doctoral research expertise (e.g., Gibson, McCormick, Walters-Symons) and early career researchers (e.g., Downey, Stonebridge) to increase the number of research active unit members aligned to the research clusters. The development of existing academic staff to become research active (e.g., Brown, Coyle, Jane, Westwood), through an inclusive and supportive research environment, has also been intentional. This strategy explains why 12 members of the submitting unit have not been submitted to previous research assessments. Additionally, we have deliberately invested in experienced research leaders, many on a fractional basis, who support a vibrant research environment, provide intentional research leadership, and offer mentorship to unit members. This explains why some of the experienced professors in the unit are fractional (e.g., Dawson 0.2 fte, Hyland 0.3fte, Jones 0.2 fte).
- 2.4 The unit has also actively sought to expand the network of visiting professors to support the vibrancy of the research environment. For example, aligned to EM&I Phys, are visiting professors Cardinale (Aspire Academy, Doha), Delves (Institute of Naval Medicine), Fallowfield (Institute of Naval Medicine) and Smerdon (DDRC Health Care, Plymouth Science Park).
- 2.5 The unit aim to recognise and develop the talents, skills and experience of academic staff and research objectives form a substantive aspect of the Performance and Development Review (PDR) discussions, which may involve dialogue with the UoA lead. Research is one of four academic career pathways that staff can demonstrate sustained and significant achievement within the academic promotion and career development procedure (see REF5a, paragraph 17). Unit members have been promoted during the assessment period, including recognition of their sustained and significant research contribution, including to

senior lecturer (Coyle, McCormick), to associate professor (Gibson) and to professor (Shum, Bloxham).

- 2.6 Aligned to the PDR all academic staff members engage in a process to establish their academic contribution plan in line with the academic contribution framework (see REF5a, paragraph 17). All unit members make a substantive contribution to teaching and learning (being HESA-returned Teaching and Research), but also have time allocated aligned to their chosen academic career pathway, e.g., 25 days dedicated to research (pro rata) for the research pathway. Time is also allocated to research leadership for example for the PGR coordinator role for sport and health (Gibson), REF unit of assessment lead (Shum), co-convenors of the newly formed research and knowledge exchange groups (Bloxham, Dawson, Jones, Layden) and chair of the ethics committee (Gibson). Such adjustments are made to demonstrate our support for staff, their excellence in learning and teaching, but equally that we value their contribution to research and research leadership.

Staff Development

- 2.7 Marjon is a signatory to the Concordat to Support Career Development of Researchers (see REF5a, paragraph 17) and the unit supports this. For example, a mentoring system includes opportunities for ECRs to research, co-author and apply for grants/funding bids with emerging researchers and professors. As evidence of this, from EMPoWER, a recently successful funding bid for student led knowledge exchange was led by Professor Bloxham (and Professor Cotton from UoA23) and included ECR Downey.
- 2.8 Marjon writing retreats, successfully launched in 2018, have also been implemented to support staff with productive writing time to generate REF outputs alongside developing a community of writing practice. Several unit members have been able to develop and finalise research outputs through the writing retreats (e.g., Bloxham, Coyle, Jane, Jones, Stonebridge, Walter-Symons, Westwood) and as identified in REF5a (see paragraph 16) these have been particularly well attended and valued by females and ECRs.
- 2.9 To generate future prosperity and development of staff, Marjon proactively encourages all staff to become research trained to PhD level (see REF51, paragraph 15), for example, Brown was supported to successful completion during the assessment period. Additionally, unit members have been supported to present research findings to a wide range of international and national conferences, enabling them to build networks, discuss latest research trends and stimulate research collaboration with external research partners. For example, from SSLD members have been supported to present at; UK Sport Development Network (Brown), European Association for the Sociology of Sport Conference (Gibson) and International Conference on Qualitative Research in Sport and Exercise (Gibson).
- 2.10 A programme of scheduled events provides a vibrant environment to enhance staff and PGR student research capabilities and support their professional development (see paragraph 2.10a to 2.10c).
- Researcher development series, aligned to the Vitae Researcher Development Framework, is delivered by internal staff or through external experts. For example, during 2019-20 there were twelve different workshops covering a range of themes including research methods/approaches, funding and bid-writing, research impact, publishing hints and tips, and research ethics.
 - Academy lecture series, which consists of presentations led by established researchers/practitioners from a wide range of disciplines. For example aligned to REAP academy series lectures have included i) Dr Jon Rudd, Ireland National Performance Director, 'Developing a high performance system', ii) Professor Steve Lehman, UC Berkeley, 'More to know in fatigue – sites and mechanisms', iii) Dr

Florentina Hettinga, University of Essex, 'The impact of intellectual impairment and cognition on performance in sport', iv) Professor Samuele Marcora, University of Kent, 'Psychobiology of endurance performance' and v) Dr Steve Ingham, English Institute of Sport, 'Science vs reality: how to support a champion'.

- c. Brown-bag seminar series, which consists of staff and PGR student presentations of their research to their peers in a supportive setting. As an example, during 2019-20 there were ten brown-bag seminars and 23 different presentations covering a range of subject areas/disciplines. From March 2020 these sessions were adapted to be delivered through MS Teams and this increased engagement, so will be sustained moving forwards.

Postgraduate Research Community

- 2.11 An identified priority of the unit has been to build on the teaching excellence in undergraduate and postgraduate courses and extend this to post-graduate research (PGR) provision. At a university level this was facilitated through a partnership agreement with the University of Chichester to offer PGR degrees from 2015 (see REF5a, paragraph 3). The recency of this agreement means the considerable progress made by the unit is not yet reflected in doctoral completion data.
- 2.12 The unit has ensured PGR students are embedded as part of the inclusive research environment and that unit staff are supported to be effective PGR supervisors. Each PGR student is typically supervised by at least two supervisors including a Director of Studies who has supervised at least one student to successful completion. The recruitment of emerging researchers (e.g., Gibson) and professors (e.g., Dawson, Jones), who have supported students to successful completion, has increased supervision capacity. The appointment of the PGR coordinator for sport and health (Gibson) with dedicated time for this role provides additional support to PGR students and supervisors.
- 2.13 The unit has had significant successes in taught Masters of Research (MRes) over the assessment period which has proven to be successful preparation for and a pathway to PGR study. Several students, with appropriate support and guidance from their supervisory team, have produced a peer-reviewed research output. For example, from the SSLD, Beacom has co-authored outputs with MRes graduates (e.g. [Beacom et al., 2016](#)) as has Gibson (e.g. [Paterson and Gibson, 2020](#)).
- 2.14 Marjon made a significant financial investment in Mayflower student PhD bursaries in 2017 to support the ambition to establish PGR provision and work towards RDAP (see REF5A, paragraph 23). Members of the unit internally bid for and benefited from five full-time Mayflower PhD scholarships in 2017. This investment supported the aim of reaching a critical mass to nurture a positive research environment. Additionally, each of the new research and knowledge exchange groups were awarded a Marjon 180 PhD bursary and an additional two students commenced PhD studies in October 2020. In total, bursaries represent investment in the region of £390k by the university and unit research projects are summarised in paragraph 2.14a to 2.14d. It is disappointing that these did not result in completions within the REF assessment exercise (in part due to covid-19 disruption) however the first submission was made in October 2020.
 - a. EMpoWER have supported a Mayflower bursary student on 'behavioural thermoregulation in the elderly' (supervisors Bloxham and Layden, external advisor Professor Pyne, University of Canberra). Aligned to the new lifelong health and wellbeing group in 2020 the Marjon 180 bursary was focused on: 'evaluating innovative health and wellbeing interventions' (supervisors Bloxham and Dawson).
 - b. EM&I Phys have supported Mayflower bursary students on research projects 'gastrointestinal permeability and heat stroke risk' (supervisor Layden and visiting

professors Delve and Fallowfield, supported by Institute of Naval Medicine) and 'non-pharmacological strategies for primary cardiovascular risk prevention' (supervisors Shum and Jones and visiting professor Smerdon, supported by DDRC Healthcare).

- c. REAP have supported a Mayflower scholar on 'ultrasound nerve mobilisation' (supervisor Shum). Aligned to the new resilience and human performance group in 2020 the Marjon 180 bursary was focused around 'An Intervention to Support New Runners Using Evidence-Based Psychology' (supervisor McCormick).
- d. SSLD have supported a Mayflower scholar researching 'the emerging role of the UK university sector in sport development: facilitating sustainable high-performance strategies (supervisors Beacom and Gibson).

2.15 There are currently 13 PGR students enrolled, aligned to research interests within the unit, which demonstrates the successful growth since 2015. The research projects align to the research cluster themes and typically cross traditional disciplinary boundaries within sport and exercise sciences; for instance, mental health literacy in sport psychology practice (supervisors Gibson and McCormick), centralising children's experience in PE, school sport and physical activity (supervisors Gibson and Jones) and an exploration of the active ingredients of group exercise referral interventions (supervisors Jones, Gibson and McCormick).

2.16 There is good evidence of the vibrancy of the research environment and contribution made by PGR students. Several unit research outputs in 2020 included PGR students as lead or co-authors. For example, PGR students Ogden and Millyard from the EM&I Phys group related to exertional heat stress ([Ogden et al., 2020a](#), [Westwood et al., 2020](#)), gastrointestinal tolerance and integrity ([Ogden et al., 2020b](#), [Ogden et al., 2020c](#)) and impairments to thermoregulation in the elderly ([Millyard et al., 2020](#)).

2.17 PGR students have a dedicated annual development budget to support their development (see REF5a, paragraph 18). For example, aligned to the EM&I Phys cluster, PGR student Millyard gave an oral presentation on the 'Influence of age on perceptual responses to thermal stress at rest and following exercise' and PGR student Ogden a poster presentation on 'Reliability of gastrointestinal barrier integrity assessment techniques following exercise in the heat' at the International Conference on Environmental Ergonomics in 2019 prior to publication of the outputs (see paragraph 2.16). Additionally, PGR students can bid for research consumables to support the rigour of their research while at the same time developing their bid writing skills.

Equality and diversity

2.18 Promoting equality and diversity aligns well to the values of Marjon and the inclusive research culture of the unit. The defined process in the approved code of practice resulted in 54% of REF eligible staff from the subject level with a significant responsibility for research (SRR). Of staff with SRR, 34% identified as female which is comparable to 37% female REF eligible staff at subject level. The subject level has a lower female academic staff base (37%) compared to the university level (64%), but this reflects the sector level for sports science (HESA 2018/19 data 36% female). With relatively small numbers other equality analysis at unit level is challenging but in summary; 12% were from an ethnic minority which is above 6% of REF eligible academics and 7% had a declared disability which is comparable to 8% declared disabilities of REF eligible academics. Overall, while numbers are low, this supports that processes were equitable and resulted in a unit level submission reflective of the subject level REF eligible academic community.

2.19 In terms of selecting outputs for submission, in line with the code of practice, equality factors were considered to aid identification of 13 outputs from the output pool to finalise the submission (best of the rest, all equally judged as 2-3*). A lower proportion of outputs

submitted (31%) were attributed to females which reflects the consideration of special circumstances submitted by female members of the unit but also reinforces the importance of university level and unit level action to improve gender equality (see REF5A, paragraph 20). Specific mentoring supporting for female academics will be implemented alongside consideration of further actions enabled through the women's network.

3. Income, infrastructure and facilities

Income

- 3.1 During the assessment period, data in REF4b for HESA cost centre code sports science and leisure studies shows the unit has generated £661 000 in competitively sourced research income, which is an average of £110 000 per annum. It is noteworthy that funding increased ten-fold from 2016-17 onwards in comparison to the earlier part of the assessment cycle, which relates to the launch of the research strategy. Competitive income has included funding from UKRI councils, UK based charities, UK industry and EU government bodies. In addition to the data in REF4b there is substantive income not included, for instance for knowledge exchange activity that aligns to our research excellence which supports the continual generation of new knowledge and its impact. Income and activities associated with each of the research clusters is summarised in paragraph 3.1a to 3.1d.
- a. The established research excellence and extensive collaborative partnership linked with EMpoWER has resulted in success in competitive research funding and knowledge exchange income. For example, during 2018-19, the Marjon Health and Wellbeing approach (Bloxham, Gibson, Jane) successfully bid for; i) back pain clinic (£15 000 income funded by Sentinel health and wellbeing; PI: Bloxham), ii) leg ulcer clinic (£159 000 income funded by Livewell Southwest for a three-year period, PI: Bloxham) and iii) workplace wellbeing interventions (£2430 income from the police and environment agency; PI: Bloxham). New initiatives for 2019-20 include' i) a pilot community strength and stability programme for older people in South Devon (PI: Shum, Bloxham, Choy, Vaughan, funded by NHS Devon Clinical Commissioning Group, £24 500), ii) a pilot pre-surgery exercise programme for cancer patients (Jane, Bloxham, Shum, funded by University Hospitals Plymouth NHS Trust, £4992) iii) Long term Conditions Project with Livewell South West £20 000 iv) Shared medical appointments project, with Evalesco Consulting and Devon Doctors funded by the Health Foundation (£70,000), of which £10,000 was secured by Marjon. The Marjon health and wellbeing clinics underpinned a successful competitive [grant award of £250,000](#), from the Office for Students and Research England, to enable the University to develop a model which other universities could follow. Early career researcher Jane was also a named co-investigator on a successful £900 000 NIHR research project 'e-coachER: Investigation of a web-based behavioural support exercise referral scheme' and while the research income to Marjon was small (£1167). This has enabled his exposure to a major funding council research project and involvement in the design and outputs of a large scale significant International project.

In addition to Marjon body reprogramming clinic for fibromyalgia, that led to Professor Hyland's significant association and subsequent employment within the unit, he is a named collaborative co-investigator on several research projects underpinned by his work on quality of life surveys including; i) body reprogramming as an adjunct to biological administration in patients with Severe Asthma (£11 802, funder GSK) and ii) a qualitative analysis of the experience of super-responders to biologic therapy in severe asthma (£9585, funder GSK). The reach of this research has extended into Europe and a further project on the burden of severe asthma on health-related quality of life in a European population is scheduled (starting 2021, funder SHARP) and this expertise has potential to be applied to 'long-covid' in the future. The addition of Professor Dawson to the unit extends the reach into areas more closely associated with

the University's growing ambitions to grow research aligned to UoA3. Professor Dawson is a named co-investigator on a successful Dunhill grant, 'Developing a co-designed systems-level response to safety issues for residents transitioning from hospital to care homes' (2020-2022), that included support from Plymouth City Council and Devon Clinical Commissioning groups.

- b. EM&I Phys has received funding and/or in-kind support for a range of research projects. For instance, as noted in paragraph 1.8a, Karatzaferi, Sakkas and Shum were successful bidding for €1,458,000 from the EU Framework Programme (Plymouth Marjon University: £117,519.00) for a project titled 'Muscle stress relief: an integrated research program linking together basic research on secondary myopathies in stress states to innovative translation in applied myology' (H2020-MSCA-RISE-2014-645648). Additionally, group members have been successful at small grant income and/or in-kind contribution for example, i) physiological responses of self-heating gloves (Bloxham, Layden, Shum, Westwood, Astec In Nano Tech, £13,400) and ii) the Institute of Naval Medicine have provided, in kind, equipment and resources estimated at circa £17 000.
- c. REAP has successfully received several small grant awards linked to their research for example; i) The impact of pathomechanics leading to postoperative gait abnormalities following total hip arthroplasty (Shum, 2016, £729, funder Royal Devon & Exeter NHS Foundation Trust), ii) mental health literacy in elite sport (Gibson, £1000, 2017, funder British Association of Sport and Exercise Sciences).
- d. SSLD has successfully received several small grant awards linked to their research for example a social research project related to the Invictus games funded by Marie Curie/International Invictus Games Foundation (Beacom, 2016, £2200).

- 3.2 The income from external sources that have supported the development of a vibrant research environment with International reach, has been supported by internal strategic investment of £1.2 million by the University, despite the absence of mainstream QR funding. During the REF assessment period this has included PhD bursaries (see paragraph 2.14, circa £390,000), a vibrant programme of research events (see paragraph 2.10), support for PhD completion and attendance at conferences (see paragraph 2.9). After this first REF submission, the unit expects to continue to be able to generate external grant income while also enabling more seed-corn funding and similar initiatives from the resultant QR funding.

Infrastructure and Facilities

- 3.3 Since 2013 a total of £2.6 million has been invested to enable development of the sports science and research laboratories and sports centre facilities. This includes £1.79 million invested in refurbishing and updating the sports centre outdoor facilities (£1.25 million) and indoor facilities (£0.25 million). In 2016/17 these facilities were ranked as 4th best in the UK (Times Higher Education Student Experience Survey). Following a significant investment of £0.81 million, in sport and exercise science laboratories and equipment, Marjon celebrated laboratory accreditation in 2016 by the British Association of Sport and Exercise Sciences (BASES). The sport and exercise science and rehabilitation laboratories have a comprehensive range of physiology and biomechanics equipment, including an environmental chamber, force plate, cardiopulmonary exercise testing equipment, motion capture system with integrated force plates, duplex diagnostic ultrasound imaging, isokinetic dynamometers, antigravity treadmill, a wireless electromyography (EMG) system, portable three-dimensional motion sensors, laser doppler monitoring system and air displacement plethysmography equipment (BODPOD). The University also has wet lab facilities appropriate for bioscience related research, nutritional analysis and cell therapy studies. The specialist laboratory facilities have supported the unit to conduct high quality original research, for instance enabling the environmental physiology research exploring exertional heat illness, including biomarkers,

by EM&I Phys (Layden, Westwood) and examining rehabilitation technique to optimise recovery (Choy, Shum) by REAP. Additionally, the specialist laboratories and rehabilitation facilities have also supported knowledge exchange for instance, hosting a public facing sports therapy and osteopathy clinic that enables students to gain professional practice experience while supporting clients, applying research which explores novel approaches to rehabilitation.

- 3.4 All Marjon Sport and Health clinics and laboratories are the responsibility of the Director of School for Sport Health and Wellbeing. The Sport and Health Science laboratories have 1.5 FTE technical staff comprised of 0.5FTE Sport and Health Science Officer and a 1.0 FTE Sport and Health Science laboratory assistant. The Sport Therapy and Rehabilitation clinic have a 1.8FTE technical staff comprised of a 1.0 FTE Sport Therapy and Rehabilitation Supervisor and 0.8 Sport Therapist. Marjon Health and Wellbeing services are delivered by 1.5FTE Lifestyle Sport and Health Co-coordinators. A further 0.2FTE graduate intern each of these three teaching, research and specialist spaces was introduced in October 2020. All graduate interns also receive a bursary to complete a PMU Masters level qualification.
- 3.5 There has been significant investment in the sport centre facilities, teaching and research, but also support for a wide range of local clubs and events (e.g., Devon Summer Ability Games, Devon Schools Hockey Finals), regular performance clubs and events (e.g., Plymouth Raiders Basketball, Plymouth Argyle Football Club) and for high performance purposes (e.g., 2015 Rugby World Cup training camp, Rio Olympic games training camps). These partnerships support the research of SSLD for instance examining sports networks and disability sport.
- 3.5 To support a suitable infrastructure for PGR students, a PGR Hub was established in 2018 including a large purpose-built facility accommodating hot-desking facilities (for 18), PCs and storage space and a meeting room.
- 3.6 Overall research of the unit is supported centrally by the research and knowledge exchange office including support for grant bids and funding, organisation of research events, administration processes for PGR students and administration of research ethics (see REF5A, paragraphs 24 and 28). Research leadership within the unit is supported through the release of staff time (see paragraph 2.6).

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

- 4.1 As outlined in paragraph 1.8 a strategic objective during the REF assessment period was to develop a network of external collaboration to support a developing but vibrant International research environment. There is good evidence of a strong network of external collaboration with practitioners, private and public-sector organisations and other research institutions across the unit as summarised in paragraph 1.8a to 1.8b.
- 4.2 As outlined in paragraph 1.7 a further strategic objective during the REF assessment period was to demonstrate and ensure societal impact from our research. The overall approach to societal impact is one built upon partnership, public and community engagement and our University civic commitments. Collaboration with organisations regionally, nationally and Internationally underpin much of this activity and some of the more sustained research and knowledge exchange activity of the unit were selected to feature in the submitted impact case studies (paragraph 1.7a and 1.7b).
- 4.3 Exemplar collaborations, the support for the unit research environment and impact on society are summarised for research clusters in paragraph 4.3a to 4.3d.
 - a. EMpoWER: To support local communities and reduce the burden on the NHS, Bloxham and colleagues research has informed the design and delivery of the Marjon Health and

Wellbeing Clinics (see paragraph 1.7a). These clinics have provided community services, in partnership with various health, wellbeing and Bloxham presented at the Houses of Parliament (2019) and informed the Physiological Society and Guild HE's report, analysing the economic benefits of Sport and Exercise Science (SES) to the UK economy. The partnerships have gone from strength to strength demonstrating the sustainability of this research activity and for instance in 2019-20 led to a ground-breaking project which could prompt a fundamental rethink in how healthcare is delivered. Ernesettle Medical Centre, which is operated by Access Health Care, has received £75,000 from independent charity the Health Foundation to support the project, which centres on the provision of group sessions, in the company of a GP and other health & wellbeing professionals, for patients suffering from similar problems.

Hyland also collaborates with researchers from The University of Exeter, Plymouth University, Birmingham university, Bristol University DUH and the RD&E in conjunction with the National Institute for Health Research Collaboration for Leadership in Applied Health Research and Care South West Peninsula to support patients with severe asthma. This group developed the Severe Asthma Questionnaire (SAQ), designed to measure the quality of life in patients living with severe asthma, considering the disease and treatment from the patient's perspective.

- b. EM&I Phys: An example of long-term sustainable, collaborative research focuses on exertional heat illness and its mitigation. This research has informed the UK Ministry of Defence policy documents (JSP 539). Further work has informed the MoD Future Defence Deployed Nutrition task and will inform future Operational Ration Pack (ORP) design, and interventions to support pre-deployment nutritional preparation and deployed operational feed. Furthermore, our work informs and supports ongoing and future heat illness mitigation work being undertaken by both the INM and the United States Army Research Institute of Environmental Medicine.
- c. REAP: McCormick's networks through the RESIST group (see paragraph 1.5b) who share their expertise in psychology of endurance performance, disseminating research-derived knowledge to the public, through RESIST website pages and videos and public engagement events, are applicable to endurance athletes, competitive and recreational participants, in addition to their coaches and leaders. In addition, we are a partner organisation of the Thrive Plymouth 10-year strategy, Plymouth City Council's policy promoting better health and wellbeing for all, reducing health inequalities across the city. The REAP group also hosted the 2017 British Association of Sport & Exercise Sciences (BASES) Student Conference based on a competitive process but the groups well established links with professional organisations.
- d. SSLD: Our partnership with Active Devon supported Beacom to chair the UK Sport Development Network (UKSDN) national conference '*Creating a Sustainable Sporting Future: Issues, Pathways and Opportunities*'. The conference drew national and international interest and involved SSLD members (Beacom, Brown) to work closely with UKSDN and the co-hosts Active Devon, our local County Active Partnership. Beacom, also participated in the international Symposium 'Where Does Sport Fit in Global Diplomacy?' (2018) and led to him twice fulfilling the role of Member of the IOC review panel and work informing the Invictus Games (see paragraph 1.5a). Research by Stonebridge on coaching behaviours and participation in high performance coaching networks supported Marjon becoming one of nine Football Association's Women's High-Performance Football Centre in 2017. Aligned to this, both the REAP and SSLD groups partner with local professional/semi-professional sports performance clubs, organisations including Plymouth Argyll Football Club, Plymouth Leander's Swimming Club and Plymouth Raiders Basketball Club. For instance, Beacom and Brown are working with Plymouth Argyle Community Trust to assist the development of monitoring and evaluation frameworks, to help assess the efficacy of community sport interventions and the potential of event leverage.

4.4 As outlined in paragraph 1.5 an additional strategic aim during the REF assessment period was to establish a reputation for research excellence, which directly links to influencing and contributing to the wider research base. These activities and initiatives have supported the unit in maximising the International reach of research and progress and indicators of esteem in relation to research excellence were summarised in paragraph 1.5a to 1.5b.