Institution: Sheffield Hallam University

Unit of Assessment: 26 Sport and Exercise Sciences, Leisure and Tourism

a. Overview

UoA 26 at Sheffield Hallam University (SHU) consists of 32 FTEs comprising 34 staff. Category A staff included in this submission are located in four research centres:

- Centre for Sport & Exercise Sciences (CSES) - 10.4 FTE staff submitted;
- Centre for Sports Engineering Research (CSER) - 8.4 FTE staff submitted;
- Sport Industry Research Centre (SIRC) - 8 FTE staff submitted;
- Tourism, Hospitality & Events Special Interest Group (THESIG) - 5.2 FTE staff submitted.

Staff from CSES and SIRC were submitted in RAE 2008. CSER was created in 2009/10 when the sports engineering group within CSES expanded to become a centre in its own right. THESIG encompasses two separate centres included in RAE 2008 (Centre for International Tourism Research, and Centre for International Hospitality Management Research). Researchers from the first three centres are in the Faculty of Health and Wellbeing, based at the Collegiate Campus, whilst researchers from tourism are in the Sheffield Business School, based at the City Campus.

b. Research strategy

UoA research strategy in RAE 2008

The five year strategy in RAE 2008 aimed at consolidating research strengths and building on their successes. Progress against the three objectives laid out in RAE 2008 is as follows:

1. **To grow capacity, develop expertise and academic excellence in each of the research areas and exploit synergies between the themes.** The number of submitted staff is one more than for RAE 2008, and each research centre demonstrates areas of continually developing expertise and academic excellence. Notable examples include: for CSES, evaluating lifestyle interventions designed to create changes in health-related outcomes in clinical populations (Carter outputs 1-3, Crank outputs 1-3, Klonizakis outputs 1 & 2, Tew outputs 1, 3 & 4) and analysing the characteristics of performance under stress for athletes, coaches and officials (Butt outputs 1, 3 & 4, Maynard outputs 1 & 2); for CSER, tennis-related engineering research (Allen outputs 1 & 2, Choppin output 1, Goodwill outputs 1-4, Kelley output 1) and the use of mathematical or numerical modeling to address sports engineering issues and problems (Allen output 1, Goodwill outputs 3 & 4, Haake outputs 1, 3 & 4); for SIRC, forecasting the Olympic and Commonwealth Games performance of national teams (Ramchandani output 2 , Shibli output 1), economic impact analysis for major events (Coleman outputs 1-4, Davies output 2), and sports facilities' performance measurement (Kung outputs 1 & 2, Ramchandani output 3, Shibli output 3, Taylor output 4); and for THESIG, analysis of the political and knowledge requirements for sustainable tourism (Mellon output 1, Bramwell output 2), assessment of tourism governance (Bramwell outputs 1-4), and exploring relationships between hospitality events and marketing through new social science perspectives (Crowther outputs 1, 2 & 3). These all build on previous work and many add capacity by developing researchers new to REF or Early Career Researchers (ECRs). Success in areas of excellence is evidenced by around 170 research projects delivered during the Ref period (REF 4b), with dissemination of key findings to academic, practitioner and policy audiences, and articles in international journals of repute.
2. **To continue to focus on user, and client orientated, areas of applied research.** This objective has been satisfied by numerous client-facing projects in all four research centres, including most areas of academic excellence identified above. Particularly noteworthy in CSES are interventions to change health related outcomes for cancer sufferers, those with post-surgery varicose-veins, and those with heart problems. One impact case study highlights work with local health agencies to influence end users. CSER became a UK Sport Innovation Partner in 2008, allowing it to pursue the development of *in situ* motion analysis systems with a number of commercial clients and governing bodies of sport, including adidas and the International Tennis Federation. In SIRC, client-orientated work includes analysis and guidance on the impacts of major events and festivals, and secondary analysis of National Benchmarking Service data. In THESIG, research on pro-poor tourism involved work with non-government agencies in less economically developed countries. Research projects undertaken by the four research centres have secured income of £5.7 million over the period (REF4b),

which is a significant achievement in a period of economic and financial uncertainty. It serves to demonstrate the synergies between academic excellence and contract research.

3. **To continue to develop areas of research that make a substantial contribution to evidence-informed policy making**. Much of the research already mentioned, as well as developing academic excellence and being client facing, informs evidence-based policy. Notable examples include: the CSES work on health interventions, which influences health policy; CSER's work with governing bodies in sport which provides evidence with which to make informed policy decisions about rules in sport; SIRC's work on the impact of events, which has influenced national and sub-national policy on hosting major events; and THESIG's work on political economy and agency-structure relations associated with state interventions, which has the potential to influence sustainable tourism policy in different countries.

REF strategy 2013 – 2018

Future strategy consolidates objectives identified in 2008 and is consistent with SHU's corporate vision of sustaining research of international standing, designed to promote solutions with a positive impact on quality of life and public policy, and which contributes to the knowledge economy. Our intellectual ambition is to strengthen established areas of research, whilst giving flexibility in responding to client demands for our research expertise. Objectives for 2013-2018 are accompanied by illustrative examples:

1. **To continue to develop expertise and academic excellence in a sustainable manner in existing research areas**. Sheffield is one of three centres of excellence which, along with Loughborough and London, combine to form the National Centre for Sport and Exercise Medicine (NCSEM). The infrastructure and research networks provided by NCSEM give CSES researchers an opportunity to strengthen existing collaborations with research partners, both clinical and non-clinical, in examining the effects of physical activity interventions in treating chronic disease and in disease prevention. In addition, the CSES work on confidence and mental toughness in elite sport is developing through a collaboration with the English Institute of Sport which has jointly funded three PhD students over four years. Staff in CSER will focus on three areas: biomechanics, analytics, and experimental mechanics. This will build upon its foundations in mechanical engineering to design, develop and implement systems to carry out research, with an emphasis on the collection of data during real events. SIRC will consolidate its work on the impacts of major events by applying its expertise and capacity to other forthcoming major events in the UK, including the Ryder Cup 2014; Rugby Union World Cup 2015, World Athletics Championships 2017; and Cricket World Cup 2019. SIRC will also continue to utilise the large data set created by the National Benchmarking Service for secondary analysis and academic outputs using industry standards of performance. SIRC's work in the SPLISS consortium (Sports Policy factors Leading to International Sporting Success) will develop because the current Phase 2 has expanded to 15 nations, offering enhanced comparative research potential in the examination of what produces sporting excellence. THESIG's work on sustainable tourism will apply path-dependence and path-creating concepts for the temporal evaluation of governance arrangements for sustainable tourism in relation to changes in their macro and micro contexts. Other work will continue applying interdisciplinary perspectives to advance understanding of tourism, hospitality and events.
2. **To exploit opportunities for developing expertise and academic excellence in new research areas**. For CSES the NCSEM development will afford new opportunities for research with a broader range of medical conditions, including mental illness, which have the potential to be prevented or managed using physical activity. Research on confidence and mental toughness will be taken into other performance contexts, such as the corporate sector. A key development for CSER will be the expansion of the UK Sport Innovation Partnership, where systems developed will be used with those who exercise for health, elite athletes and coaches, and also with sports companies seeking to develop new equipment. In turn data sets available from these systems will mean that informatics and analytics will become increasingly important. SIRC has recently conducted several studies using Social Return on Investment analysis and anticipates significant academic outputs arising from this technique, particularly on the social value of sport. New avenues for SPLISS work include sport-specific, and Paralympic, analyses.

In addition, complementary research into medal forecasting is developing into analysis of a variety of outputs produced by elite sports events. THESIG will apply new theoretical perspectives from environmental politics to understand the multi-level, and multi-actor, governance of sustainable tourism. Work will also focus on using new critical social science perspectives across tourism, hospitality and events research, and on applied studies of event marketing and events as value creation.

3. **To continue to focus on applied research that can create impact in society and make a substantial contribution to evidence-informed policy making.** All existing and new areas of excellence in the four research centres are characterised by applied research with potential impact on society, typically via evidence-informed policy. A strategic imperative is to promote potential impact, through professional and policy-making bodies and through dissemination of research outcomes.
4. **To sustain or increase the number of research-active staff.** This particularly involves developing a higher proportion of staff currently active in contract research, such that they are also producing high quality REF outputs. Particularly important to this objective will be enhancing research and impact planning at both the individual and group levels, and mentoring of staff new to the REF.
5. **At least to maintain research income and numbers of research students which have been attained in the REF period.** This is a challenging ambition in the current and foreseeable economic environment; however, this remains of continuing importance if levels of research activity are to be sustained.

c. People

i. Staffing strategy and staff development

The approach towards staffing strategy within the Unit is consistent with SHU's principles for research staff development, which are in turn conditioned by the *Concordat to Support the Career Development of Researchers.* SHU's commitment to these principles has been rewarded with the *HR Excellence in Research Award* from the European Commission. SHU aims to create an environment that respects the diversity of all stakeholders, enabling them to achieve their full potential. It has a gender, race and disability equality scheme which ensures compliance with all relevant legislation. Examples include a commitment to good practice in employing people with a disability (*Positive about disability*), a *Right to Request Flexible Working Policy* for parents and carers, and in July 2010 SHU achieved the Bronze award for the Athena SWAN Charter *Women in Science, Engineering and Technology*, recognising the University's commitment to eliminate gender bias and develop an inclusive culture. Four of the UoA's submitted staff are on part-time contracts and 8 are female.

Capability and capacity. The UoA has a core group of research active staff in that 16 of those in the current submission entered RAE 2008. In addition, there has been a policy to develop ECRs (Allen, Choppin, Foster, Kelley, Mellon/nee Cox) and staff new to REF (Breckon, Carter, Charlish, Kung, Ramchandani, Rotherham, Tew). Six new staff have also been recruited (Crowther, Davids, Hopkins, Klonizakis, O'Hagan, Tresidder). The four research centres are committed to the development of research capability and research careers. SHU invested over £2.4 million in the UoA between 2009-10 and 2012-13. This income was provided to the research centres to support infrastructure, facilitate funding of staff to carry out research, and funding of PhDs. The research base for the UoA is relatively young, with around 50% under 35 years. Evidence of the impact of SHU's record of supporting research career development comes from the VITAE *Straight Talking* project (Loughborough University, 2012). This showed that SHU researchers' level of 'satisfaction with / optimism for' their career was 79%, compared with an average of 56% across eight participating HEIs. A key element in the staffing strategy is that researchers are employed on permanent posts to ensure stability and progression. In the 2013 *Careers in Research Online Survey*, SHU was found to have more than two thirds of researchers on permanent contracts, compared to 'the post-92' average of one third and an all-HEI average of 20%.

Staff who consistently deliver beyond their job descriptions are regraded and given enhanced responsibility. In this assessment period submitted staff have been promoted to Professor (Rotherham), Reader (Blackshaw, Breckon, Butt and Copeland), Principal Research Fellow (Crank, Wheat), Principal Lecturer (Crowther), Senior Research Fellow (Ramchandani, Tew) and

Research Fellow (Allen, Choppin and Klonizakis). Two staff have been awarded fellowships: Haake (EPSRC Senior Media Fellowship, 2010-12 and first Fellow of the International Sports Engineering Association, 2012), and Choppin (Software Sustainability Research Fellowship, 2011-12; British Science Association, 2009).

Research support. Career development responsibility is shared between SHU and the researcher: institutional structures support development whilst researchers are encouraged to identify training and development needs that will achieve objectives and career aspirations via an annual appraisal process. Formal staff appraisals occur at least once a year, and for research-active or research-aspirant staff, research and REF activity form explicit parts of the appraisal process. Staff are asked to account for delivery against agreed targets for the previous year and to agree a programme of delivery for future years. Informal monitoring of research outputs occurs on a more frequent basis. A system of staff mentoring for less experienced researchers such as ECRs often extends to team work and co-authorship. Examples include Haake and Goodwill's support for Allen and Choppin; Taylor's work with Ramchandani (output 3) and Kung (outputs 1 & 2); and Bramwell's support for Mellon/nee Cox's output and Meyer (output 1).

The most critical resource for staff is research time. In CSES and CSER the allocation of research time for staff also involved in teaching is reviewed quarterly, conditioned by research activity and plans. In SIRC and CSER, most staff work on contract research but are also allocated 1.5 days a week for personal research, PhD supervision, professional development and other academic activities. In CSES approximately 1 day a week is allocated for non-project/non-teaching time. In THESIG, allocation of research time follows annual applications and appraisals, with separate research hours for established researchers and a bursary scheme for ECRs. Staff development budgets are used mainly for conference attendance and training (and vary between £500 and £1,000 per head p.a.).

Research Centre staffing policies provide individual support and mentoring to research staff. Further research support and development sessions are held at Research Centre away days and Faculty conferences. SHU provides a suite of training courses for researchers, covering personal and professional development and research and knowledge transfer skills, in line with the Vitae Researcher Development Framework. The Faculty hosts skills workshops for its researchers with the involvement of internal and external facilitators and research experts. Examples include cross-faculty workshops by Winter on research and writing skills for PhD students, and CSER workshops on Writing for Publications. In addition, a programme of research seminars is held - 33 between October 2011 and December 2013 - led by either internal or external speakers, the latter including five speakers from the USA and two from Australia.

SHU's approach to promoting research integrity is recognised by the European Science Foundation (Fostering Research Integrity in Europe, December 2012) and it is part of the UK universities research ethics network to establish quality kite marking for research ethics committees. The UoA has clear and cogent support for ethics approval to allow the rapid and safe development of research projects (http://www.shu.ac.uk/research/ethics/). Ethics approval for all studies is based on robust, well established processes. Scrutiny of proposals is managed by Faculties' Research Ethics Committees under the aegis of SHU's Research Ethics Committee. The Health and Wellbeing Faculty Committee is recognised by the National Health Service to undertake independent scientific review of projects. The Faculty Research Ethics Committee intranet website contains a series of good practice research guides.

ii. Research students

The table below shows PhD numbers increased from 13 FTEs in 2008/9 to 44.5 in 2012/13, with 36 successful completions (REF4a) compared with 24 in the previous RAE period.

Table 1. PhD progression 1/8/2008 – 31/7/2013

Year	Full-time	Part-time	Total FTE	PhD Degrees Awarded	Cumulative Award Total
2008/9	7	12	13.0	7	7
2009/10	15	11	20.5	5	12
2010/11	18	13	24.5	7	19
2011/12	21	17	29.5	6	25
2012/13	34	21	44.5	11	36
Total	95	74	132	36	36

Studentships and recruitment. The increase in PhD numbers has been achieved through both internal and external funding. External sponsorship for 15 students (typically for 3 years) came from: ESRC, EPSRC/UK Sport CASE (3 students), British Diving, British Swimming, adidas (2 students), Prince (2 students), Golphysics, English Institute of Sport (3 students), and Universities UK ORSAS scheme (2 students). SHU has provided bursaries for 15 studentships: 4 CSER, 5 THESIG, 3 CSES and 3 SIRC. Admissions criteria conform to Quality Assurance Agency and UK Border Agency guidelines. Recruitment is normally through open competition, with interviews by relevant staff and/or applications to external funding agencies. Induction takes place annually at University level and is supplemented by local induction procedures and an electronic resource available on the Research Student Blackboard site (a Virtual Learning Environment).

Quality of training and supervision. SHU took part in the 2013 *HEA Postgraduate Research Experience Survey*. Comparator data from this placed the UoA at SHU above sector averages in four of the seven main scales; 85% of SHU respondents from the UOA expressed overall satisfaction with their research degree experience. Research students have formal support as outlined in SHU's *Code of Practice for Research Students and Supervisors*. Supervisory teams consist of a Director of Studies and a second supervisor. Members of supervisory teams must have at least two PhD completions or have undertaken SHU's *Research Supervisor Development Programme*. Of the 34 REF submitted staff, 24 supervised PhD students in the REF period. Bramwell supervised 17 and achieved a University Inspirational Research Supervisor award in 2013. All new PhD students go through a bespoke training needs analysis. At least once every two weeks students have minuted meetings with their supervisory team, at which they set the agenda. Students pass through strict gateways to ensure progression. RF1 after three months clarifies the research question and ethics status. After 10 months a review stage assesses progress and suitability for doctoral study. After one year the RF2 process provides a rigorous assessment of the candidate's ability to succeed at doctoral level: the candidate presents a 6,000 word progress report outlining the potential contribution to knowledge of the project, supplemented by an oral assessment. Two rapporteurs provide independent assessment. Research ethics approvals are checked again. PhD training is consistent with the Vitae Researcher Development Framework and operates at three levels: research methods competence; research skills common to cognate disciplines; and transferable skills such as time management and personal development planning. Additional bespoke sessions are also available through the online skills training package Epigeum. Training is directed centrally, but implemented locally, to reflect discipline and epistemologically-based preferences. For example, an annual Faculty programme for CSES, CSER and SIRC students is held with seven PhD training workshops and three careers-orientated workshops.

Research Management and Support. Faculties have Research Degrees Committees to implement SHU's regulations, policies and procedures. A Code of Practice for Research Students and Supervisors outlines the quality framework, thus helping to facilitate timely completion and a high quality student experience. An Annual Monitoring and Feedback Exercise assesses all Research Degree programmes, based on the completion of an online questionnaire by students and supervisors and feedback against performance indicators.

PhD students are encouraged to present at conferences and to publish in peer reviewed journals. Students are funded through Faculty grants to attend and present conference papers: 15 students presented at international conferences in the REF period. Students are funded to undertake overseas and UK fieldwork. For instance, THESIG funds up to £1500 for fieldwork for each research student and since 2008 has supported fieldwork by 13 students in ten countries. THESIG

has a PhD research exchange relationship with researchers at the University of Girona, Spain, PhD students from which have presented their research at two joint PhD conferences with Sheffield University Management School.

Infrastructure. There are well-equipped spaces for doctoral students, with dedicated spaces for full-time students and hot-desk facilities for part-time students generally within close proximity of supervisors and research laboratories. Each research student has computing facilities with access to email, internet and computer software, telephone, fax and photocopying facilities, and to SHU's learning centres/libraries. The libraries have full access to online journals with database search facilities. Technical resources such as laboratories, workshops, consumables or specialist equipment needed for higher degree studies are established at the outset and access agreed.

Career progression and employability. PhD students are treated as rounded academics in the making. They are encouraged to see their PhDs as jobs, which involves keeping office hours and working in a professional environment. PhD students gain experience by supporting the delivery of knowledge transfer and consultancy projects to external clients as part of their extra-curricular paid activity. Under Research Fellow supervision, students learn how to develop and deliver professional projects in a timely fashion. Students have been members of research teams on projects with adidas, British Diving, GB Boxing, Prince, Golphysics, Puma and the International Tennis Federation, which has enhanced both their PhD studies and their vocational experience. PhD students are supported in their career progression and 13 have been recruited as staff within the UoA (CSER 6; THESIG 6, CSES 1), of whom five are submitted in the current assessment (Allen, Foster, Kelley, Mellon/nee Cox, Tew). Former doctoral students in CSES now lead the English Institute of Sport (EIS), EIS Psychology for Northern England and sport psychology support for GB Sailing, GB Boxing, GB Gymnastics, GB Speed Skating, GB Diving, England Cricket and Harlequins RUFC. Destinations for THESIG PhD students include lectureships in China, Mongolia, Taiwan, Thailand, Greenwich, Leeds and Nottingham.

d. Income, infrastructure and facilities

(i) Income

REF4b indicates external research income of £5.7m to 2012-13, representing a 66% increase on the RAE total of £3.5m. This is about half of the total income for the UoA, the other half being £6m knowledge transfer funding, including consultancy. The division of research income across the research centres is approximately: SIRC 47%; CSES 23%; CSER 27%; and THESIG 3%. It includes significant funding from the British Academy for Blackshaw (SIRC) in 2008/9 and 2009/10; from the British Council for Meyer (THESIG) in 2009/10 and 2010/11; from the EPSRC for Haake (CSER) in 2009/10 to 2012/13; and from the NHS/Dept. Health for Copeland (CSES) in 2011/12 and 2012/13.

Most external income reflects contract research projects which provide 'added value' in the form of new empirical evidence, which in turn underpins many outputs listed in REF2. For example, most of the income for the major sports events by SIRC was for primary research and associated reports to contract clients, but the cumulative evidence enabled Coleman (4 outputs) and Davies (output 2) to generate events academic outputs. This illustrates synergy between contract research and academic excellence: income from the former facilitates the empirical base for academic outputs. Success in this respect has determined the UoA's main objective for income generation: to seek income-earning opportunities from all sources, including consultancy contracts, which facilitate research outcomes. This approach helps secure financial viability, enhances our external reputation and provides data to support academic research.

Other strategically important elements service the main income generation objective. First, we ensure that we have skills and infrastructure that are fit for purpose (see c (i) above and d (ii) below). UoA staff have a wide range of technical and research methods skills which enable us to compete successfully for projects from a diverse set of funding sources. Second, we work to develop and nurture 'rich' partnerships with key clients, in order to create continuing research and income-earning opportunities. Relationships which exemplify this approach include those with Sheffield Teaching Hospitals (CSES), Professional Games Match Officials Ltd (CSES), national governing bodies of Sailing and Diving (CSES), the International Tennis Federation (CSER), adidas (CSER), UK Sport/English Institute of Sport/Scottish Institute of Sport (CSER), UK Sport (SIRC), Sport England (SIRC) and the Youth Sport Trust (SIRC). Attributes important to achieving

'rich' partnerships with clients are effective communications, with informal communications being just as important as formal reporting opportunities, and flexibility - adapting to the evolving needs of projects. As testimony to its track record, SIRC has recently secured authorisation to bid for projects under Sport England's Research and Evaluation Framework Agreement, for statistical analysis and modelling, and for mixed methods data collection and analysis.

A third strategically important requirement for success in achieving project funding is the maintenance of high quality research and outputs, both client-facing and academic. This is secured by tight project management procedures, methodological rigour, and close relationships with clients. Project management is directed by senior staff and focusses particularly on resource use and scheduling. It dovetails with staff appraisal processes such that multiple demands on individual staff are managed, rather than being dealt with in an ad hoc manner. Methodological rigour is maintained by experience, team working and professional development.

The search for external funding is driven by an appropriate blend of reactive and proactive actions. We continually monitor appropriate organisations and websites for procurement notices. We use our professional networks to gather intelligence on forthcoming research and knowledge transfer funding opportunities. We also actively engage 'rich partners' in the development of research ideas. Most external research income is achieved after open competition with other HEIs and commercial consultancies. Bidding is typically a collective process, with appropriate teams formed to meet a project's methodological and subject specialism requirements. Where internal resources are insufficient, or internal capacity constraints pose a risk to project feasibility, partnerships are formed with appropriate research and/or consultancy organisations.

(ii) Infrastructure and facilities

All staff have well-equipped accommodation, either in individual offices or open plan space, together with access to a desk, PC and telephone, with shared scanning, photocopying, printing and administrative support. Additional equipment such as iPads, laptops, mobile telephones and data projectors are provided on an 'as needed' basis. SHU supports new technology funding requests through capital expenditure bids. Recent investments include Teleform survey design and scanning software (£16k p.a.), World App online survey package licence (£8k p.a.), Infostrada database licence (£15k p.a.), iPads for surveying (£10k), a Phantom Miro M10 camera (£20k), and a CASE treadmill (£27k).

Each research centre has designated administrators (2FTE in CSES and CSER, 1 in SIRC and 1FTE in THESIG) whose tasks include overview of finance, purchasing and PhD students. CSES also has 6 full-time technicians who are shared between teaching and research. They play a vital role in the preparation and maintenance of labs and are centrally involved in data collection for the vast majority of the lab-based intervention studies. For instance, their work underpins all REF outputs for Tew, Winter and Klonizakis, and outputs 1 & 2 for Crank.

The main laboratories for the UoA are based at Collegiate Hall, servicing the requirements of CSES and CSER. They have the following: a 90 m^2 biomechanics laboratory equipped with a 12 camera MAC system, 4 fixed and 2 mobile Kitzler force plates, an instrumented Kitzler treadmill, 3 Phantom high speed cameras; two 90 m^2 physiology laboratories for full blood analysis; a 20 m^2 environmental chamber with -20°C to +40°C and 0-100% relative humidity range; a 30 m^2 fitness suite for clinical populations; a bespoke strength and conditioning suite for athlete consultancy; two fully instrumented interviewing suites; a 3D body scanning suite; an electronics prototyping room; and a full mechanical workshop with which to manufacture prototypes and bespoke equipment.

SHU's Research and Innovation Office (16.2 FTE staff) provides central expertise in support of research activity, helping to maximise intellectual outputs from market-driven research and create commercial technology transfer relationships with external organisations. For example, commercial agreements for CSER's exploitation of software have been made with the International Tennis Federation (‘Spin Doctor’) and adidas (‘adidas Snapshot’).

SHU's learning centres provide high quality academic information resources and excellent IT facilities to meet the needs of researchers. Last year SHU spent just under £3m on information resources, of which £969,329 was allocated to journals and £905,641 electronic databases. Twenty-four hour opening during semester allows convenient access to print and media resources and to study facilities. A fast and effective Document Supply Service obtains items for researchers

which are not held in SHU's collections. Learning centre Helpdesks bring together a wide range of services, including information enquiries and 24-hour IT support. Specific IT support for staff in this submission includes ensuring the availability and reliability of Teleform and World App survey software for SIRC's facilities performance measurement and events impact work. Staff are strongly encouraged to deposit their work in SHURA (SHU Research Archive) an open access repository containing scholarly outputs and publications authored by SHU researchers; 5616 items were listed in July 2013 and in 2012/13 there were 304,630 downloads.

e. Collaboration and contribution to the discipline or research base

The UoA's contribution to the disciplines covered by the research centres emanates from the symbiotic relationship across contract research, higher degrees, impact, and intellectual development. Most of the outputs submitted by the UoA are generated as either direct products or added value from contracts or PhD level research. Project clients typically agree to the publication of academic outputs because it enhances the dissemination of results, impact, and the intellectual credibility of the work. Complementing these relationships, other activities increase our potential for contribution to the disciplines, including research networks, journal editorships, conference participation, and work with professional associations.

Research networks. Collaborations are important means through which to progress research ideas, deliver high quality outputs, and develop young researchers. A key collaboration for CSER has been its UK Sport Innovation Partnership. The Phase 2 of the Partnership (2012-2016) has expanded to include the Scottish Institute of Sport, the English Institute of Sport and Sport Wales. Fundamental research on performance analysis tools, analytics and informatics will be carried out mainly by three EPSRC/UK Sport Case studentships between 2012 and 2016 working with speed skating, hockey and canoeing. These projects will work with the UK's top coaches to transfer current knowledge of performance analysis in the research community.

Inter-disciplinary work has been facilitated by the Engineering for Life project funded by EPSRC. The UoA was funded to deliver seven demonstrator projects with partners from sports engineering, sport and exercise science, engineering, art and design and health. This created contributions to knowledge relating to breast support during radiography, the use of the low-cost depth cameras (the Kinect) for motion analysis, the development of a smart floor for gait analysis, and the link between science, sport and art. These initiatives led to other partnerships with Derby General Hospital (breast health), British Cycling (body scanning), the University of Reutlingen (smartfloor), and Badminton England (shuttlecock aerodynamics).

THESIG has contributed to new thinking and approaches in its research area. It hosted an ESRC-funded research seminar in 2010 on the impact of migrant workers on the functioning of labour markets and industrial relations in tourism and hospitality. Bramwell was Visiting Researcher at University of Nottingham, Ningbo, China and at Phuket Rajabhat University, Phuket, Thailand. This last collaboration resulted in one joint research paper with Krutwaysho (Bramwell output 3). Meyer co-edited a book on alliances for tourism, conservation and development with van der Duim at Wageningen University, NL, and Saarinen at Oulu University, Finland, which includes Meyer's REF output 2. She also edited a Journal of Sustainable Tourism Special Issue on tourism and poverty bringing together leading international researchers.

SIRC collaborates with the consortium leading international elite sport policy research (SPLISS). SIRC's participation in this research group has led to publication in top journals in the field of sports economics on three continents; elite sport policy becoming a recognised 'track' on the European Association for Sport Management conference; and considerable media exposure for the group's research before, during and after the Olympic Games of 2008 and 2012. Shibli's output 2 is a direct result of his work with SPLISS. He is a visiting fellow at Waseda University in Tokyo, Japan which has led to Japan being a partner in the SPLISS project ahead of its successful bid for the 2020 Olympic Games.

Contribution to Journal Editorships. Maynard was Editor of The Sport Psychologist (2005-12). Winter is an Associate Editor of the Journal of Sport Sciences. Allen and Choppin were guest editors of the Journal of Sports Engineering and Technology (226, 2, 2012) on modelling in sport and were subsequently appointed associate editors of Sports Engineering (2012). Taylor is general editor of Managing Leisure: An International Journal (since 1995). Shibli edited a special edition of

Managing Leisure: An International Journal, on the management of excellence in sport (17, 2/3, 2012), which directly relates to his outputs 1 and 2. Bramwell is Co-Editor of the Journal of Sustainable Tourism (since 1993), an Associate Editor of the Journal of Ecotourism (since 2000), and a Resource Editor of Annals of Tourism Research (since 2008).

Conferences. CSER is the host for the International Sports Engineering Association and will host the 2014 International Conference on the Engineering of Sport. With Allen and Choppin associate editors of Sports Engineering, SHU is the international home for sports engineering, influencing international strategies for dissemination of research in the area. Maynard was on the Scientific Committee of the Association for Applied Sport Psychology annual conferences from 2004 to 2013. Shibli and Davies are both members of the Scientific Committee for the European Association for Sport Management. THESIG co-sponsored a conference with Shanghai East Normal University and the University of South Carolina on Tourism and development: Mega-events and urban tourism, held in Shanghai, China, 2008. Bramwell served on Scientific Committees for international tourism research conferences in Shanghai, China (2008), Rhodes, Greece (2009), Kos, Greece (2009), Eastbourne, UK (2009), Crete, Greece (2010), South Africa (2009 and 2010), Lisbon, Portugal (2010), Rhodes, Greece (2011), Reims, France (2011), Mytilene, Greece (2012), Corfu, Greece (2012), and Taiwan (2013). Meyer was a Scientific Committee member for an AHSA conference (2009) and ATLAS Africa Conferences in Botswana (2009), Uganda (2011) and Rwanda (2013).

Contributions to professional associations and initiatives to develop the disciplines. Maynard was the chair of the Division of Sport and Exercise Psychology (DSEP, 2010-13) within the British Psychological Society (BPS), chaired the qualifications committee from 2008-11 within DSEP, and has been invited onto the technical advisory group of EIS (from 2013). Winter was the Secretary of the British Association for Sport and Exercise Science (BASES) from 2008-11. Haake is a voting member of the International Tennis Federation Technical Commission, which sets the rules of tennis worldwide and formulates and funds research to develop a broad understanding of tennis. Bramwell has reviewed research grant applications for a variety of national and international organisations, including the British Council, EPSRC, Research Council of Norway, and the Social Sciences and Humanities Research Council of Canada, Crowther was Co-Chair of the Academy of Marketing Special Interest Group for Experiential Marketing. THESIG reviewed hospitality management education for the Council for Hospitality Management Education.

Prizes and awards for research. Staff received 23 awards in the five years to 2013, which testify to the quality of their work. These include:
2013: CSER, Sports Analytics Research Institute of the Year, Sports Innovations Summit; Tresidder, best track paper, Council for Hospitality Management Education annual conference.

2012: CSER, Podium Awards, RCUK Award for Exceptional Research Contribution; Copeland, Best Development Paper Award, British Academy of Management annual conference.

2011: Haake, UK Sport Ideas4Innovation, 1st Prize; Goodwill, Northern Sports Awards, winner Best New Sports Technology, for 'iBoxer'; Goodwill, Academic Challenge Award, Technical University Munich, winner in Competitive Sports Category, for 'Tennis GUT'; Haake and Heller, Sri Lanka Institute of Information Technology (SLIIT) Research Symposium, Gold Award for Best Overall Research Paper; Crowther, Best Practitioner Paper, Academy of Marketing Conference; Tew, BASES Early Career Researcher award at the BASES annual conference.

2010: Driscoll and Kelley (PhD students), best presentations, ISEA conference, Biarritz.

2009: Shibli, best paper award at the Sport Management Association for Australia and New Zealand (SMAANZ)) conference; Taylor, Shibli and Kung, Best Case Study at the 2009 European Association for Sport Management (EASM) conference; Tew, BASES post-graduate poster prize at the Annual Conference.