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The Institute of Sport & Exercise Science aspires to develop a national and international reputation for research in related disciplines and areas, embracing all forms of research with a focus on applied research and knowledge transfer.

Within this special edition of Sports Update we report the latest news and activities in research and consultancy. Features include an interview with PhD student Jenni-Louise Douglas, a preview of the prestigious World Congress of Performance Analysis of Sport IX which we host in July, sociological research in athletic talent migration and on-going sports science support activities with Worcester Rowing Club.

As research and knowledge transfer develops rapidly within the Institute we welcome applicants for postgraduate study on a range of taught Masters and on research degrees.

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SIXTH TIME CHAMPIONS

The University of Worcester’s Men’s Basketball Team has been crowned British Universities and Colleges Sport (BUCS) champions for the sixth time in eight years.

The team beat Durham in the final of the annual BUCS contest to take the title in Sheffield on 19 March. It has been a double winning season for the team who also won the Northern Premier league.

The team, coached by Paul James, who is also head coach of England men’s, and BBL side Worcester Wolves said: “It was a great weekend with all our team contributing to the success at different times. Durham played some excellent basketball and we are delighted to win such an exciting final between two evenly matched teams.”

GB at Paralympics

A member of staff and two graduates of the University of Worcester have been named in the Great Britain Blind Football squad for the 2012 Paralympic Games.

The British Paralympic Association announced staff member Will Norman and graduates Keryn Seal and Lewis Skyers. Lewis is one of two sighted goalkeepers in the team.

The Great Britain squad is also being coached by University of Worcester Sports Coaching Science lecturer David Mycock.

Will, who also played at the Beijing Paralympic Games in 2008, said: “I’m delighted to have been selected. It will be a huge honour to step out on to the pitch in our home nation. We have been training hard, and will continue to do so in the hope that we can secure a medal at the Games.”

David Mycock said: “We have a very talented team who are committed and keen to show the world what they can do.”
Research performed at Worcester has investigated the phenomenon of pacing (defined as the distribution of muscular work rate over the duration of an activity) in individual rowers within a crew of four. Pacing is an interesting issue as it determines the degree to which athletes are able to recognise their physiological potential within competition.

Although this is a subject that is relatively simple to investigate during individual sports such as running or cycling, rowing is far more complex as four individuals need to simultaneously attempt to maximise their physiological output whilst at the same time aim to avoid catastrophic physiological failure before reaching the finish line. By setting up a normal competition boat with a device called the Powerline System it has been possible to measure power outputs produced with each stroke by each individual rower within a crew during trials over different distances. The remarkable finding was that although the overall power profile of the boat is identical to that frequently reported during self paced trials in a number of different sports (characterised by a high initial power output, a reduction in work rate in the middle stages and an acceleration or ‘endspurt’ in the final 10%), this was achieved despite considerable variation between individual rowers. This finding was replicated during trials over differing distances. This raises the interesting question of how individual crew members regulate their own work rates to produce an overall crew strategy identical to that which athletes display in individual sports. It also raises questions regarding the efficiency of the strategies displayed. It may be the case that variation between individuals is beneficial in that crew members exhaust there energetic resources at different rates. Alternatively it could lead to loss of mechanical efficiency meaning that energy is wasted in moving the boat sideways as opposed to in a forward direction. Planned further research intends to address these questions through longitudinal monitoring of pacing strategies and associated changes in actual performance. The research will be published later this year: Renfree, A., Martin, L., Richards, A. and St Clair Gibson, A. (2012) All for one and one for all! Disparity between overall crew and individual rowers pacing strategies during rowing. International Journal of Sports Physiology and Performance 7 (4).

SPORTS SCIENTISTS WORKING WITH WORCESTER ROWING CLUB

Worcester Rowing Club have enlisted help from Sport and Exercise Science Staff at the Motion and Performance Centre in order to support their coaches and athletes to improve their performance.

Annie Lambeth-Mansell, Andy Renfree and Dr Andrea Faull have led workshops focusing on sports nutrition, physiology and training and dealing with pressure in competition. One specific intervention is the detailed monitoring of individual rower’s responses to training in an attempt to maximize beneficial adaptations whilst minimizing the risk of overtraining. As the first signs of impending development of overtraining are often subtle changes in mood states, rowers have been instructed to regularly complete simple questionnaires which generate scores relating to parameters such as anger, tension, depression and vigor. Alongside these, the rowers are also instructed to complete simple training diaries which allow calculation of training load, monotony (the degree to which load varies from day to day - the rationale being that a highly monotonous schedule is more likely to induce overtraining), and strain (the product of load and monotony). Over time the intention is to build a large database of scores for individual rowers. This may mean it is possible to identify values for load, monotony and strain that provoke mood disturbances in individual athletes. If this is possible then it should mean that once these scores have been identified then individualised schedules can be devised that mean athletes should never overtrain again.
ISES to host the prestigious
World Congress of Performance Analysis of Sport IX

This summer the ISES plays host to the ninth World Congress of Performance Analysis of Sport, the leading academic and applied knowledge transfer event for sport performance analysts and researchers worldwide. The four-day Congress features keynote sessions from leading academic researchers and applied practitioners from the UK, Portugal, South Africa and Australia, covering topics in Basketball, Wheelchair Basketball, Soccer, Athletics, Performance Analysis and the Media and Movement Patterns in Team Sports. The Congress will be the largest to date in its 21-year history and by far the most significant research conference ever hosted by the ISES, with over 200 abstracts accepted providing the delegates from Australia, Austria, Brazil, Cameroon, Croatia, Estonia, Finland, Germany, India, Iran, Ireland, Italy, Japan, Mexico, New Zealand, Norway, Poland, Portugal, Qatar, Russia, South Africa, South Korea, Spain, UK, Ukraine and USA, with 90 podium presentations and over 110 poster presentations.

ISES Professor, Derek M Peters who is Chair of the Local Organising Committee and a member of the Scientific Committee, notes that ‘the scope of ‘sports performance analysis’ now incorporates the majority of scientific disciplines associated with preparing for, undertaking and benefiting subsequently from sport and exercise performance. The 200+ delegates will come from an array of sport science backgrounds including notational analysts, sport physiologists, biomechanists and psychologists as well as a wealth of private and National Governing Body (NGB) coaching, performance analysis and sport science support practitioners across a range of team and individual sports including soccer, basketball, rugby, cricket, handball, volleyball, cycling, golf, tennis and badminton to name but a few. The delegates therefore truly represent not only the scientists working in the field of sport performance analysis and sport science per se, but also those who are required to translate and transfer academic knowledge to their sport performers and to their sport as a whole’. The Congress will provide a vibrant, innovative and world class scientific programme to stimulate all who attend. The Congress is already supported by a number of commercial partners, with a wide range of performance analysis relevant exhibitors and contributors making it an outstanding Congress to meet new people, learn from each other, exchange ideas and make plans for the future. If you are interested in attending the Congress or sponsoring it in some way, please visit the Congress website at: www.worc.ac.uk/wcpas9/ for further details.

THE BIOMECHANICS OF CYCLING

Institute of Sport & Exercise Science staff member Mark Corbett took a semester of project leave to research the biomechanics of cycling, developing the commercial bicycle fitting service in the University’s Motion and Performance Centre (MPC).

The research element of the project looked at the repeatability, variability and validity of using 3D motion capture for dynamic analysis of cycling. 15 riders were measured at various power levels on 3 separate occasions. For each trial over 40 different parameters were calculated relevant to optimising riding position with respect to efficiency, comfort and injury prevention. The retest error of these parameters was examined to confirm the process was accurate and reliable enough to be useful for intended purpose.

The results form an essential foundation for future work that relies on motion capture for any similar biomechanical measurements, not just limited to cycling.

Also under the project the rider database has expanded to some 50 riders improving our experience and understanding of typical rider issues and normal data. A mobile capability was demonstrated with a visit to Hereford Technical College. The service continues to develop and has brought in over £2,500 to the MPC.
Athletic talent migration: understanding socio-cultural complexities through Fijian rugby

Dr Gyozo Molnar spent some of his time during project leave researching athlete migration, collective identity and the historical and political tensions/contexts in which Fijian rugby players find themselves. In collaboration with Dr. Kanemasu (University of the South Pacific, Suva, Fiji), this research forms part of Dr. Molnar’s ongoing research into athlete migration and forms part of the work developed within the Institute’s Socio-Cultural Studies of Sport, Exercise and the Body research group. The research is currently in press in *Sport and Society*, and Drs. Kanemasu and Molnar will present a follow up study at the 4th International conference on Sport, Race and Ethnicity at The University of Ulster in Belfast later this year.


Abstract:
Rugby is widely regarded as Fiji’s ‘national’ sport. Fijian athletes are a prominent global presence in professional rugby today. It is estimated that about 450 athletes from this small island nation are currently scattered across the globe playing rugby, with 249 of them contracted by professional clubs. However, Fiji rugby is impacted on by and positioned in the historical inequity between the ‘core’/’metropolitan’ and ‘peripheral’/’satellite’ countries. That is, Fiji has been deeply implicated in the interests and discourses of colonialism and hence its status as a ‘national’ symbol is far from uncontested. Therefore, this article investigates the tension between core/periphery dimensions that surfaces at times of international competition such as the Rugby World Cup when national allegiance and the politico-economic logic of international rugby assume added significance.

Jenni-Louise is in the second year of her PhD in the Institute of Sport and Exercise Science, which is jointly funded by the University of Worcester and Coventry University. Jenni’s PhD is titled ‘The effectiveness of sport specific strength & conditioning interventions on performance related fitness in female novice equestrian event riders’. Scientific investigations researching equestrian athletes is limited, so here we ask Jenni about her motivations to study Eventing, the research programme and the impact she hopes the research will have.

What were your original motivations for choosing a sports related BSc/MSc?

I didn’t! I have always had a passion for sport choosing to study PE at GCSE and A Level and participating in many sports such as equestrian (multiple disciplines), ju jitsu, trampolining and so on, but both my BSc (Hons) and MSc are in Equine Science. I was studying the physiology of the horse. The focus of both my dissertations were on the kinematics of the equine spine and I had an interest in equine biomechanics, equine exercise physiology and equine sports medicine where I had success in publishing my MSc dissertation in the Journal of Equine Veterinary Science.

What were your reasons for choosing to complete postgraduate (PhD) study in this area?

Post MSc I gained a lecturing post at Hartpury College. I am a REPS L3 accredited personal trainer and a Level 1 accredited UKSCA strength and conditioning coach and have strong passions for training human athletes alongside equine interests. I became frustrated teaching Rider Performance modules where the research was so lacking and became more fascinated with concept of strength and conditioning for the equestrian athlete as opposed to the equine, so I guess you could say it was a natural progression for me to satisfy my own curiosity whilst hopefully helping the performance of athletes in equestrian sports by embarking upon this PhD.

What’s the focus of your PhD research?

The main aim of the PhD is to evaluate the effectiveness of sport specific strength and conditioning training interventions for the enhancement of rider fitness and performance in adult female novice event riders.

Eventing is a discipline comprising three phases: dressage, show jumping and cross country. As research is so limited in Eventing (one published paper), we couldn’t just ‘jump in the deep end’ and devise an intervention immediately. We need to understand more of what is required from Event riders physically so the PhD broadly is split into three segments.

The first study was to determine the physiological demands of competitive one-day event riding in novice female event riders. The second study is to determine anthropometric and fitness characteristics between levels of event riders. Lastly, based upon the results of the first two studies I will design, implement and evaluate the most effective strength and conditioning methods and approaches for event riders.

What are some of your key findings through your research work so far?

The first key finding is that as a rider progresses through the horse’s gaits (walk, trot, canter), heart rate and oxygen consumption increase. In walk and trot rising, values are low, however in sitting trot and in canter values raise markedly. The causal factor at present is considered to be higher levels of isometric contraction particularly of the trunk. It is the faster gaits, and jumping that require the rider to adopt a ‘forwards’ position causing the weight bearing to be through the riders legs, as opposed to the pelvis. It is apparent that these modes of forwards seat riding significantly increase metabolic cost.

My initial study found that all three phases of the Event produce high heart rate, moderate blood lactates and that grip strength decreases significantly. The Cross Country phase elicits the highest physiological strain where riders spent 75% of total phase duration in 90-100% of their heart rate maximum. There is undoubtedly a high physiological strain provoked from Event riding but our data indicates signs of psycho-emotional stress as high heart rate is and is not supported by high blood lactate levels (4.7mMol). One minute prior to competition heart rate was high despite no physiological load, which indicates symptoms of anxiety. This is not unexpected as Eventing is a risk sport. High heart rates may also be explained by the fairly static nature of the horse-riders position. It has been documented that isometric (static) muscular contractions increase heart rate considerably. Interestingly, grip strength decreased by 14% post the Event. This could be attributable to restricted blood flow from continuous isometric muscular contraction.

What would be your top 5 tips for students to make the most out of their UG/PG studies for a career in sports industry?

1. Experience in both applied and academic sports settings. It is really important to be able to transfer academic findings to a more applied audience.
2. I would encourage all students to gain work experience in their field of choice.
3. I would also encourage students to read around and outside their subject area of study.
4. Organisation is crucial. Try to write up your notes after a lecture and read around that subject area in greater depth.
5. Aim high, don’t hold yourself back. You will only achieve what you want to!
All operational fire fighting staff will have their general fitness assessed once a year by a qualified exercise physiologist; control room and support staff will be eligible for fitness testing on a voluntary basis. The fitness tests will include resting measures (resting pulse, body composition, blood pressure, lung function) as well as grip strength and a cardiovascular fitness assessment (The Chester Step Test which measures the hearts ability to recover after exercise).

In addition to an individual feedback report of the test results, fire fighters will be provided, if required, with advice on nutrition, fitness and stress management. Standardised advice will be provided by preparing detailed action sheets that can be provided to fire fighters who do not meet or in danger of not meeting the recommended health standards.

Those who do not reach the critical health standards, designated by the fire service and the Occupational Health unit, will be prescribed either a remedial wellness programme followed by a re-assessment, or referred to the Occupational Health Nurse. These services will be aimed at improving the health, safety and wellbeing of fire fighters.

The Manager at the University’s McClelland Centre, said: “We are delighted to have been awarded this NHS contract to carry out fitness assessments for the firefighters of the three counties. It is testament to services that we can offer, and the back-up available from our academic staff. Working with outside agencies is the way forward, and we see this as the first of many joint ventures with partners in a wide variety of sectors.”

**THE SOCIOLOGY OF SPORT**

The Institute’s sociologist of sport, Dr Gyozo Molnar, has released a new book - *Sport, Exercise and Social Theory: An introduction*

- **Why are sport and exercise important?**
- **What can the study of sport and exercise tell us about wider society?**
- **Who holds the power in creating contemporary sport and exercise discourses?**

It is impossible to properly understand the role that sport and exercise play in contemporary society without knowing a little social theory. It is social theory that provides the vocabulary for our study of society, that helps us ask the right critical questions and that encourages us to look for the (real) story behind sport and exercise.

Sport, Exercise and Social Theory is a concise and engaging introduction to the key theories that underpin the study of sport, exercise and society, including feminism, post-modernism, (Neo-)Marxism and the sociological imagination. Using vivid UK and Global examples and descriptions of sport-related events and exercise practices and issues, the book explains why social theories are important as well as how to use them, giving students the tools to navigate through them with confidence through any course in the sociology of sport and exercise. This book shows how theory can be used to debunk many of our traditional assumptions about sport and exercise and how they can be a useful window through which to observe wider society. Designed to be used by students who have never studied sociology before and thus including a whole chapter on the practical application of social theory to their own study, it provides train in critical thinking and helps students to develop intellectual skills which will serve them throughout their professional and personal lives.

Dr Gyozo Molnar (University of Worcester) and Dr John Kelly (University of Edinburgh) provide an engaging discourse analysing sport, exercise and their relationship with social theory. It is published by Routledge and will be available at the end of October 2012.

**WORCESTER WOLVES VISIT SITE OF NEW WORCESTER ARENA**

The Worcester Wolves basketball team paid a visit to the site of their new home ahead of their play-offs clash this weekend.

The Wolves visited the Worcester Arena, which is currently under construction, to get their ‘first feel’ and to see where they will be playing next year.

Director of Basketball Paul James said: “It’s fantastic to see how the Arena is developing. We are very much looking forward to its completion and to making it our new home and playing in front of 2000 spectators.”

The £15m Arena, in Hylton Road, is due to open in early 2013 and will be the first British purpose-built facility for wheelchair athletes, outside Stoke Mandeville.

Professor David Green, University of Worcester Vice Chancellor, said: “We are delighted that construction work of the Arena is on budget and on schedule.

“The Arena will provide a first-class facility for both able and disabled athletes and children from early next year. Building the Arena now is also providing much needed jobs in construction. Once it opens it will generate many new jobs in sport, recreation and education.”

**FITNESS ASSESSMENTS FOR FIREFIGHTERS**

The University’s McClelland Centre for Health and Wellbeing has been awarded an NHS contract to deliver annual fitness assessments for the fire fighters of the Hereford and Worcester and Shropshire counties. The contract has been awarded by officials at the Working Well Centre, part of Worcestershire Acute Hospitals NHS Trust, which began providing occupational health and wellbeing services to Hereford and Worcester in January. This partnership provides a strategic opportunity for the centre to work collaboratively with local public services representing a joined up public sector approach to deliver key health services.

Once a year, firefighters of the Hereford and Worcester Well Centre, part of Worcestershire and Shropshire counties, will attend a voluntary fitness testing programme. Those who do not reach the critical health standards, designated by the fire service and the Occupational Health unit, will be prescribed either a remedial wellness programme followed by a re-assessment, or referred to the Occupational Health Nurse. These services will be aimed at improving the health, safety and wellbeing of fire fighters.

The Manager at the University’s McClelland Centre, said: “We are delighted to have been awarded this NHS contract to carry out fitness assessments for the firefighters of the three counties. It is testament to services that we can offer, and the back-up available from our academic staff. Working with outside agencies is the way forward, and we see this as the first of many joint ventures with partners in a wide variety of sectors.”
Latest Research Publications of ISES Staff


STUDENTS PRESENT AT NATIONAL CONFERENCE

Sport & Exercise Science student Sarah Browne reports on the British Association of Sport & Exercise Science annual student conference.

In April this year I and three other students from the University of Worcester attended the BASES student conference, held at the University of East London. Over the three day visit we had the opportunity to attend a variety of presentations held by key note speakers including Dr Aki Salo (University of Bath), Dr Sophia Jowett (University of Loughborough), Dr Gary Brickley (University of Brighton) and Dr Keith Gilbert (University of East London). These presentations were linked together by an underlying theme of the London 2012 Olympics.

During the second day of the conference we all presented our own research in the form of an oral or poster presentation. This was a fantastic opportunity to not only explain and demonstrate our dissertation findings but to also receive positive and constructive feedback. This also gave us the opportunity to listen to other students work from universities around the country, giving us an insight to the wide range of research that is currently being undertaken. On the final day of the conference, all attendants were taken on a guided tour to the Olympic park, seeing the Olympic stadium, Velodrome, and the Aquatics centre.

We all thoroughly enjoyed the BASES student conference, coming away with a positive experience and a feeling of enthusiasm and excitement for the work we had completed and achievement we gained.