

RESEARCH AND **ENTERPRISE**

A Teesside University Magazine

Issue 9



Welcome

Welcome to the ninth edition of Research and Enterprise, our flagship magazine about research, innovation and business engagement at Teesside University.

As Vice-Chancellor, I am often asked how I see our University's role in the region. That is an easy question for me to answer, because, like every other member of University staff, I know that the current and future success of the University is inextricably linked to the economic, social and cultural success of the Tees Valley and wider North East.

In economic terms, when we all face such unprecedented change, radical approaches to generating new industrial and entrepreneurial growth are required. I believe that Teesside will play an even bigger role in the future in directing the University's talents, expertise and resources towards delivering real opportunities for businesses, organisations and individuals.

We are working to encourage new generations of entrepreneurs, through programmes like the unique DigitalCity Fellowships Scheme, which has created some 160 new digital businesses. We have also launched entrepreneurs@tees, a partnership initiative with our Students' Union to encourage our students to adopt an entrepreneurial mindset and to see running a business as a serious career option.

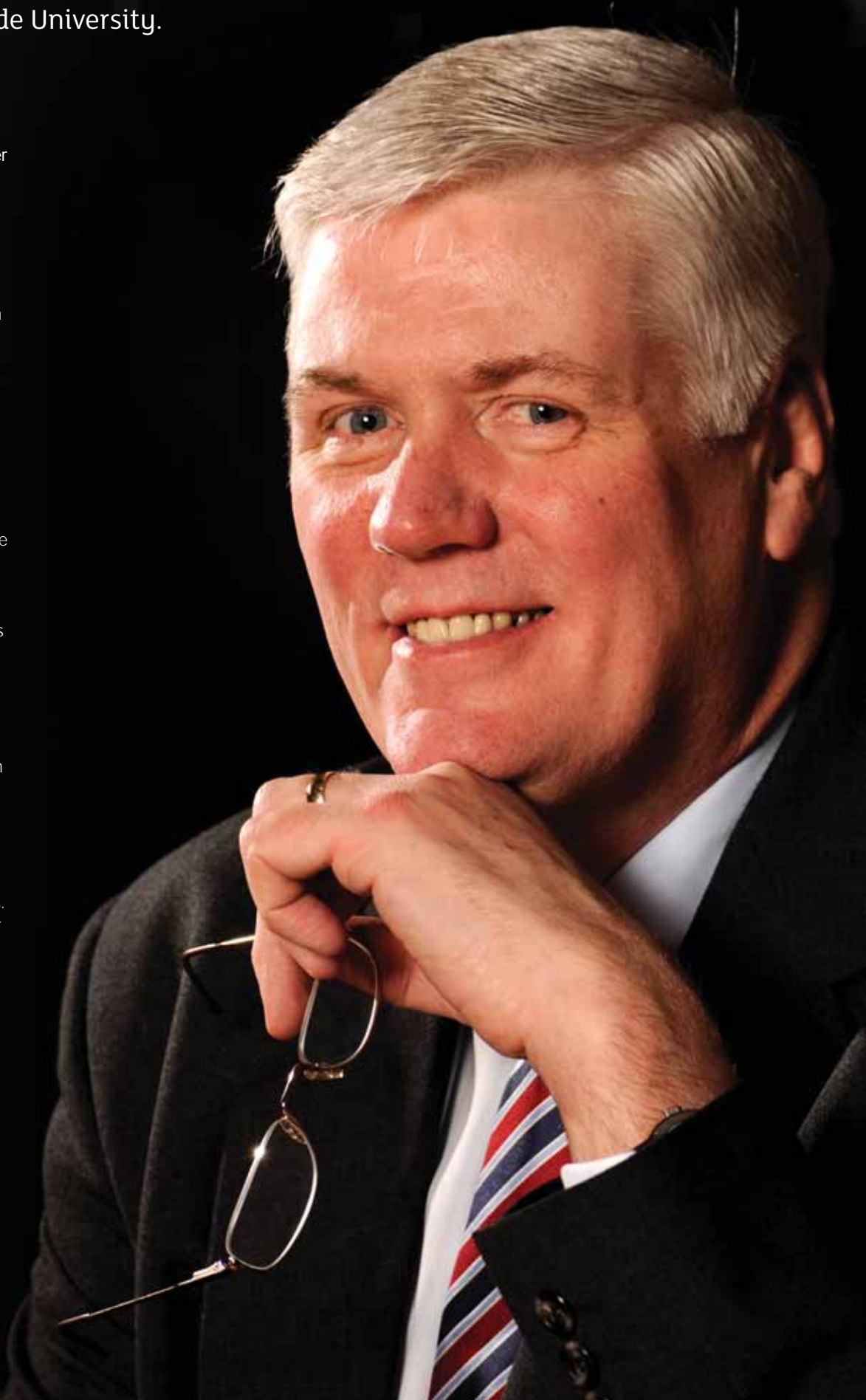
As the University for Business, Teesside continues to focus on productive partnerships, through skills development, knowledge transfer and graduate internships, to deliver real performance improvements for companies – whilst at the same time giving our students and graduates the skill sets to make a positive contribution in the workplace from day one.

On the research front, the concept of research impact has become increasingly important in demonstrating the way in which academic enquiry, applied to real-world problems, can inform policy change and produce solutions that can change lives. I am particularly encouraged by the way in which our five Research Institutes have begun to drive such a significant change in the research culture of the University to maximise this impact.

So, although we are undoubtedly living in uncertain economic times, with many challenges ahead of us, the University remains absolutely committed to building on our strong regional partnerships with a view to capitalising upon the productive capacity, innovation and creativity of the Tees Valley and the wider North East to deliver maximum economic benefit.

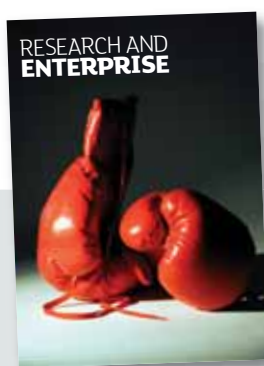


Professor Graham Henderson CBE



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RESEARCH AND ENTERPRISE was produced by Teesside University's Marketing & Student Recruitment Department for the Department of Academic Enterprise.

EDITOR NIC MITCHELL **PHOTOGRAPHY** JUDY HUME **DESIGN** CHRIS LOFTHOUSE

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Inspiring success

> ENTERPRISING ACADEMICS

NIC MITCHELL meets enterprising academics Steve Smelt and Tim Thompson who are successfully combining the love of their academic disciplines with an entrepreneurial spirit.

Fit for business



From helping Middlesbrough and Sunderland players get back to full fitness to offering the same kind of service to amateur athletes. That's what motivates Steve Smelt.

Five years ago, when he retired from treating professional football players, Steve saw his dream become reality. As a senior lecturer and programme leader in sports therapy at Teesside University, he won pump-priming financial backing from the University's enterprise fund and launched Teesside Sports Injury Centre as a social enterprise.

With the main base on the University's Middlesbrough campus, satellite clinics were soon established at venues such as Darlington's Dolphin Centre and Stokesley Leisure Centre.

And today the Centre's clients include local top long distance endurance runner, Sharon Gayter.

In September 2010 Sharon had an operation to remove a large cyst from inside her ankle bone – it involved stem cell treatment that left her with a drastically weakened bone that needed to be able to respond to light stress. Running outdoors was out of the question.

Desperate to get back to good health and reclaim her crown as Britain's number one long distance runner, she turned to Steve at the Sports Injury Centre. Sharon, a graduate from Teesside's sport and exercise master's, does part-time lecturing at the University and had heard about the newly opened hydrotherapy swimming pool on campus.

Sports injury staff, drawn from Teesside's sports therapy degree, put together a recovery programme for her.

'I needed to get back to running, but my ankle bone couldn't support my weight – the underwater treadmill was a godsend. With the water absorbing 70-80% of my body weight, I ran against an underwater jet stream three times a week for a month. Underwater cameras helped monitor the impact on my legs. For one-to-one rehab, this is absolutely magnificent', said Sharon.

Her first comeback was the 2011 Athens International Ultramarathon. Reassured that her bones had been strengthened and restored to fitness by the hydrotherapy pool, Sharon went on to run a 120km race in the Netherlands in April, becoming the fastest-ever British finisher.

Sharon is now preparing for some of the world's toughest endurance races over summer, including The High – the world's highest 'ultra' going up to 18,000 ft in the Himalayas. Only one person has ever finished the 135 miles to date.

Sharon also hopes to reclaim her British crown at the Commonwealth Mountain and Ultra Championships in North Wales in September – providing she suffers no further injuries.

Steve is delighted with her progress and with the success of Teesside Sports Injury Centre. As well as giving a unique service to North East athletes like Sharon, it also provides invaluable work placements to Teesside students.

'We've certainly come a long way since our initial £5,000 business start-up grant from the University's Department of Academic Enterprise. We attract some great talent to our sports therapy degree and it's marvellous that we can share their skills in the clinic, offering a service to sportsmen and women in the region.

'This is a social venture. We're not about making a profit for ourselves – the University is only looking to cover its overheads and its investment in our excellent facilities. But, by helping get our elite athletes back to full fitness, and supporting other local sportsmen and women through our commercial arm, I think we live up to our reputation as a University that serves its community, encourages an entrepreneurial spirit and provides a first-class educational experience', says Steve.

For more information contact Steve Smelt, Teesside Sports Injury Centre.

T: 01642 342355
www.teesside-sports-injury-centre.org

'We've certainly come a long way since our initial £5,000 business start-up grant.'

Sharon Gayter with Steve Smelt



Down to the **bones**



When the phone rings late at night for Dr Tim Thompson, it's likely to be the police saying they have found a skeleton. What they need to know is whether they're dealing with a recent crime or have stumbled across some archaeological remains.

Tim, pictured above, doesn't mind – he's used to it. And he sees it as a useful way of sharing his knowledge and expertise as Teesside University's senior lecturer in crime scene science and digital forensics.

But he does think the identification process could be more accessible for those who, unlike him, don't have a PhD in forensic anthropology.

Tim recently submitted his digital technology plans to the 2010 Blueprint Business Plan competition, which celebrates enterprise and innovation among North East university staff and students each year.

He won the Ward Hadaway Science Award at Teesside's Blueprint area finals and was highly commended in the Knowledge Transfer Staff category at the regional finals.

That gave him the confidence to polish up his business plan. And, with a grant from Teesside University Enterprise Development Fund and help from a DigitalCity Fellowship, Tim launched his spin-out business, Anthronomics.

'In much forensic anthropological work, we're still using pen and paper and stills photography for casework, research and teaching. My idea is to digitalise as much of the process as possible, developing appropriate protocols for scanning the bones into 3D models.

'Bones are actually very difficult to scan. You're dealing with holes and pores, lumps and ridges and a combination of organic and inorganic materials. It's not as easy as you might think.

'But my new company plans to work with experts at the University, including our own Teesside Manufacturing Centre, to create the scans.'

Tim is also creating new information management software. 'By importing the bone data straight into the software, we hope to give much quicker information to people who aren't

trained forensic anthropologists – about the sex, age and height of the body. This will be a great help in determining what the police might be dealing with – a recent murder victim or someone who died centuries ago?'

The new company is already established in one of Teesside University's business incubation units. It's looking at having its first scans available by the end of 2011 to market to universities, schools and colleges. 'It will be a great classroom aid for teaching biology, anthropology and forensic science', says Tim.

'I wanted to register the company at the University because it's such a good place to access funding opportunities and the University has been so supportive. As a spin-out of my University work, it makes a lot of sense to base it here.'

Boxing game to win health

Fight

Can a group of researchers help to make middle-aged Teesside men fitter by creating a high-intensity exercise environment in social clubs? NIC MITCHELL finds out more.



Teesside has some of the country's most chronic areas of health inequality. It's a problem closely linked to the decline of traditional employment in industries like steel, engineering and shipbuilding and the rise of sedentary lifestyles which increase the risk of obesity and cardiovascular disease.

But that may be about to change for one of the at-risk groups – men in their middle age who use social clubs.

For a multi-disciplinary team of researchers at Teesside University is rising to the challenge and trying to get regulars at social clubs healthier through a novel high-intensity exercise video game. Trials are under way at two clubs – the Beechwood Easterside and District Social Club in Middlesbrough and the Buffs Social Club and Institute in Stockton.

The Research Councils UK Digital Economy Programme is backing the project with a grant of just over £200,000.

The research team, led by Dr Iain Spears, Reader in Sports and Exercise with Teesside University's Social Futures Institute, have created an immersive alternative to the Nintendo Wii and

are using this when they visit the social clubs.

Men in the target age group – mid thirties to mid fifties – are invited to take part in three 90-second rounds of virtual boxing against a computer-generated avatar opponent on a large screen. They are expected to do the mini boxing rounds three times a week whilst on nights out with friends over a 12-week period.

Health indicators, such as whole body fat, cholesterol, blood pressure and aerobic fitness, will be measured before, during and after the intervention. Katie Lock, a specialist in complex health interventions at Newcastle University, is helping determine whether this fun approach to health promotion can have real benefits for public health.

Among the first volunteers is 46-year-old Mick Smith. He was a time-served welder at Smith's Dock shipyard, South Bank, before moving to Anglesey to become a farmer. Now back on Teesside, he is the full-time secretary at the 4,800-strong Beechwood and Easterside club.

Mick admits to being 'a stone or two heavier' than he would like to be. 'I joined a gym, but probably only go once or twice a fortnight. I'd like

to be healthier and this sounds a great way to get a bit fitter around my work and social life. There's quite a lot of interest from social club members in my age group, but it is harder exercise than I expected.'

Dr Alan Batterham, Professor of Exercise Science, and Liane Azevedo, a member of the Centre for Translational Research in Public Health, are co-researchers on the project. Both are based in Teesside's Health and Social Care Institute.

Dr Batterham said, 'The exercise will be high-intensity interval training, with relatively brief periods of playing the game interspersed with recovery periods, like a scaled-down version of boxing rounds.

'There is a growing body of evidence that brief, relatively high-intensity exercise of this type is beneficial for health. We are developing and pilot testing the exercise programme, but we believe that a 10-15 minute session in total, three times a week, may be sufficient to benefit participants.'

Dr Spears explained that despite its success, the Nintendo Wii and its motion-capture system was not considered suitable for their project.



Mick Smith throws a punch under guidance from Sport and Exercise research associate Tom McBain

‘There is a growing body of evidence that brief, relatively high-intensity exercise of this type is beneficial for health.’

Other systems were either too expensive or too slow to capture rapid movements associated with high-intensity exercise.

‘So we’ve adapted motion sensing chips as used in the Wii controller to make our own ‘exergaming’ system.

‘When playing the games you need to have your wits about you to avoid a harmless, but still very realistic on-screen ‘knock-out’ by the on-screen avatar sparring partner’, said Dr Spears.

Co-researcher Dr Wen Tang, from Teesside’s Digital Futures Institute, added ‘Teesside’s photo-realistic 3D boxing game is embedded with an artificial intelligent computer boxer whom human players can fight at three different levels of skills and intensity.’

And Teesside’s work is attracting commercial investment,’ said Dr Spears. ‘We have just signed a technology licensing deal with an established fitness brand and are currently working with them to bring the technology to a global market.’

Co-researcher Dr Paul Crawshaw, a medical sociologist and Associate Dean (Research and Enterprise) with the University’s School of Social

Sciences & Law, said, ‘Health inequalities are one of the great intractable issues facing places like Teesside, Liverpool and Glasgow, where you can walk just a mile or two and find huge differences in life expectancy.

‘We know it is partly access to healthy lifestyles. The value of this project is to see whether we can reduce health inequalities by giving people opportunities to be healthy in their everyday environment.

‘I want to see whether we can make an impact on quality of life outcomes in poorer areas of the North East. It is no good just telling people on low incomes to join a gym, especially with membership starting at £300 a year.

‘You’ve got to find a way to reach people and I’m fascinated to see if our ‘exergaming’ intervention among regular members of social clubs can make a difference to wellbeing and physical activity. We’re not trying to force people to lose weight. We just want to see whether we can help make people healthier using a fun form of technology in very familiar surroundings.’

The future for research

Universities are turning their attention to the 2013 Research Excellence Framework which will be considering the impact research has on society. Here NIC MITCHELL talks to Cliff Hardcastle and Zulfiqur Ali about what it means for Teesside University.



Teesside University was encouraged by the results of the last Research Assessment Exercise (RAE) in 2008, which marked something of a turning point for research at Teesside.

But far from resting on its laurels, the University has been actively creating a stronger research community and strengthening links between research and enterprise, particularly where these support social and economic regeneration in the North East.

With 30% of Teesside's submission for the 2008 RAE classed as internationally excellent or above, Professor Cliff Hardcastle, Deputy Vice-Chancellor (Research & Enterprise) says, 'We have a good foundation to build on for the new Research Excellence Framework (REF) and now the challenge is to take our research to an even higher level.'

'The outcomes of the REF will enable universities to assess the relative quality of their research, and we know it will take a much closer look at impact, or in other words the benefit of university research to society', says Professor Hardcastle.

The most significant development since 2008 has been Teesside's investment in five new Research Institutes to focus on its strengths, build up a critical mass of research activity in areas where it sees the greatest potential for growth and high-quality work, and encourage multidisciplinary research across School boundaries.

'There is now wide recognition of the need to bring together people from different disciplines to solve societal challenges such as creating a productive economy, a healthy society and a sustainable world', said Professor Hardcastle.

The Research Councils UK-funded project led by Dr Iain Spears from the Social Futures Institute (see page 6) is a good example. The work involves academics from health and social care, sport and exercise, computing, engineering and social policy.

'The next two years will be a very important period for the future of research at all universities, but particularly the modern universities which made something of a breakthrough in the last RAE. The QR funding received by Teesside as a result of the RAE is being put to good use in building up a stronger research base', says Professor Hardcastle.

He and Professor Zulfiqur Ali, Dean of the Graduate Research School, accept the REF will be challenging, but they are nevertheless confident the University will achieve a good result.

Professor Ali says, 'Our research strategy will be to focus increasingly on our best-quality work. This reflects government thinking on university research, as recently spelled out by Business Secretary, Vince Cable, when he said, 'There is no justification for taxpayers' money being used to support research which is neither commercially useful nor theoretically outstanding.'

'There is now wide recognition of the need to bring together people from different disciplines to solve societal challenges.'

Professor Ali says 'We don't have any trouble with that and, given the constraints on public funding, it is likely that there is going to be greater research concentration in some areas.'

'Research Councils will, however, also want to support collaborations across institutions when enhanced outcomes and impact can be delivered. This represents an opportunity for our focused research strategy, particularly in terms of supporting research that will have impact by bringing societal, cultural and economic benefits.'



Professor Cliff Hardcastle and Professor Zulfiqur Ali

Getting the environment right

Professor Zulfiqur Ali took over as Dean of the Graduate Research School last year and is determined to create a strong research environment within Teesside University.

'The Research Institutes reflect the University's strengths in computing, technology, health, history, social policy and business, as well as arts and design. We are currently looking at the research areas which we are likely to enter in the REF and trying to give researchers within these areas the support they need.

'Whatever the outcome we feel it is vital to pursue research which supports the University's scholarship and the regional economy. So, while the REF is very important, it is not the only thing that informs our research strategy.'

Professor Ali cites the University's role in supplying the economy with skilled PhDs and says, 'We're concentrating our postgraduate researchers into the areas of highest quality so that we can provide them with the best environment for their work. We also want our postgraduate researchers to be more closely aligned with business and the public and cultural sectors, and to encourage them to develop skills which will enhance their employability and entrepreneurial approach.'

Professor Hardcastle adds, 'The world of research is becoming increasingly competitive, but, here at Teesside University, we are determined to pursue research excellence and link it to our enterprise agenda. Our Graduate Research School has proved to be the ideal model to drive forward the University's future plans for research and we're delighted to have Zulf Ali as its Dean.'

His priorities are to support postgraduate researchers and academic staff in their work while developing the Research Institutes within the University.

'Teesside has excellent research in computing, history, social policy, art and design, business, health and engineering', he says, adding, 'The focus will increasingly be on supporting the highest quality of research taking place in the Research Institutes.'

The Graduate Research School (GRS) is responsible for research funding and projects, research degrees, and policy and strategy within the University.

Professor Ali says, 'There's an increasing need for the University to develop research collaborations with private and public sector partners within the region, nationally and internationally, and GRS is there to help. Teesside University is leading the North East Enterprise Europe Network which will help support and develop collaborations as well as accessing finance for research and development projects.'

One of the new initiatives launched by GRS in 2011 has been the TURN (Teesside University Research Network) events, which take place on the first Wednesday of every month and provide a more informal approach

to information exchange between researchers, whether academic staff or post-graduates.

'We are also disseminating research funding opportunities and news through the University's web-based 'on research' series', says Professor Ali, who is delighted with the progress GRS is making.

Before his appointment as Dean of GRS, Professor Ali led the Technology Futures Institute. 'The Research Institutes are particularly important for increasing both the quality and quantity of research carried out in the University. They provide more of a focus for our research as well as supporting synergies between the different disciplines. I'm also keen that we support research-informed teaching in the University's six academic schools.'

Professor Ali was born in Pakistan and grew up in Huddersfield. His specialist area of expertise is chemistry and after gaining a PhD from the University of Manchester, he worked for the Department of Pharmacy at Brighton before joining Teesside University in 1996. He has co-ordinated several EU projects and leads the nano and microsystems research group at Teesside University.

A renewable **future** beckons

The Chair of the Tees Valley Local Enterprise Partnership, Sandy Anderson, tells JOHN DEAN why there are reasons to be cheerful about the area's industrial future.



When he looks out over the Teesside landscape, Sandy Anderson sees evidence not only of a proud industrial past but also of exciting days to come. And as Chair of one of the first Local Enterprise Partnerships in the country, he has more reason than most to focus on the area's future because his role is to help make it happen.

A highly experienced chemical industry man – he held senior positions with ICI and the Tioxide Group on Teesside for many years – Sandy has ambitious plans for the Local Enterprise Partnership (LEP), the body approved by the government to drive forward business growth in the Tees Valley area following the demise of regional development agency One North East.

One of the reasons Sandy is passionate about the challenge ahead is that he is also Chair of Ensus UK, the Teesside-based wheat refinery. The company processes soft wheat, normally used for animal feed, and extracts sugars which it converts to ethanol, recovering the protein as a by-product for animal feed. It then sells the recovered carbon dioxide to the drinks industry.

Substituting bioethanol for oil-based fuels reduces greenhouse gas emissions and the damaging side-effects of fossil fuels, and it's the kind of groundbreaking thinking that Sandy sees replicated in businesses across the area.

He says, 'A critical element of our LEP submission to government was our ambition to build on our established capabilities in areas such as chemical process and advanced engineering.

'The Coalition Government has made it clear that it wants to rebalance the economy away from the financial sector and towards manufacturing, and we want to help them do that.

'We see industrial biotechnology and renewable energy, driving towards a low carbon economy, as key to achieving this. And here on Teesside, we have the expertise and the infrastructure to support this rebalancing.'

Sandy says, 'The chemical industry has kept a low profile historically, but it has much to be proud of. Go back 30 or 40 years and the industry's environmental performance was poor – but it has improved hugely since then. A lot of time and money has been invested and much of that experience can be applied to the theme of sustainability, which will become increasingly important over the coming years.'

Sandy is buoyed by the number of companies and business organisations working to develop new-generation green technologies in the area.

He says, 'There are many reasons to be cheerful. We have the skills base, we have experience in handling large-scale capital investment in chemical plants and we have a long history of this sort of operation. We have shown our adaptability.'

He sees the University, where he chairs the Board of Governors, playing a key role in the new industrial revolution, arguing that it has worked hard to bring academics and business together in the area. To underline the point, he cites the decision to appoint businessman Alastair Thomson as Dean of Teesside University Business School.

'Old barriers between academia and business have long gone in this area,' he maintains. 'As a University, we are committed to engaging with business. The Business School and the School of Science & Engineering both have powerful advisory boards drawn from commerce and industry which guide the development of our courses. We have also actively supported the growth of the digital sector through the Institute of Digital Innovation and DigitalCity, creating many new businesses and encouraging young people to become involved with science and technology.

'So yes, I am hopeful for the future – we have to grasp them but the opportunities are right here in the Tees Valley.'



'The chemical industry has kept a low profile historically, but it has much to be proud of.'

'We've spent two years assessing ways to convert biomass into fuels.'

Fuel of the future

As the world runs out of oil and gas, it urgently needs to find alternative fuel supplies. Here we meet the Teesside professor whose research team may hold some of the answers.



A major breakthrough in the world of renewable fuels could help free poorer countries from their dependence on oil and gas and help meet the longer-term energy needs of richer nations.

So says Maria Olea, Professor of Chemical Engineering and Catalysis at Teesside University, who believes the answer lies in biomass.

Her team of researchers at Teesside has spent two years assessing ways to convert biomass into fuels as well as valuable chemicals. Biomass usually refers to any biological material from living or recently living organisms but can also include any biodegradable waste, including municipal solid waste.

If successful, the work will provide a newly developed way of producing renewable fuels, especially in countries which do not have ready access to oil and gas resources.

So exciting is the idea that scientific teams around the globe are involved in a chase to achieve breakthroughs – and the UK team says it is close to achieving a significant advance.

A Defra-funded project, in which Teesside is a partner, is looking at the conversion of biomass into chemicals as well as fuels. The other partners include the Universities of Newcastle and Surrey, together with the North East of England Process Industry Cluster (NEPIC) and six local companies.

Professor Olea, based in Teesside's Technology Futures Institute, is the University's lead on the project. She says, 'At the heart of our work lies the search for catalysts with high activity and selectivity, along with chemical and thermal stability, which can then be used to convert natural materials and wastes into chemicals and fuels on a commercial scale. Through anaerobic digestion, biomass and organic wastes are converted into biogas, which contains methane and carbon dioxide. Our aim is to develop a catalytic route to convert biogas into syngas, or synthesis gas, which contains carbon monoxide and hydrogen. The syngas can then, using specific catalytic routes and under particular operating conditions, be used as a building block for producing chemicals and synthetic fuels.'

What is more, hydrogen within the syngas can be used in the hydrogen economy, helping to power fuel cells.

Professor Olea said, 'What we are looking for are catalysts that can do the job. Our project is split into two parts. One deals with the catalytic conversion of biogas to syngas, while the other deals with the catalytic conversion of syngas to fuels.'

'We are very close to completing the laboratory phase after which we will have the best catalysts. The next stage will be to test them out in a larger-scale industrial setting and for that we will need partners.'

'These projects are important because oil and gas are running out – it may take a hundred years, but they are running out – and we need alternatives. In addition, this work might not matter at the moment to rich countries with access to oil and gas, but it does to smaller countries. Our work could give them the independence they need.'

> WE MEAN BUSINESS

We mean **business**

At the height of the recent recession, Teesside University launched an ambitious action plan to help businesses and individuals through hard economic times. But what did it achieve? And, as a period of economic austerity beckons, what comes next? NIC MITCHELL finds out from Laura Woods.



The North East started 2011 on an optimistic note – with Sahaviriya Steel Industries (SSI) taking over Redcar's mothballed Teesside Cast Products and Hitachi announcing plans to manufacture high-speed train carriages close to the County Durham birthplace of the railways.

The region also celebrated 14 successful bids to the government's Regional Growth Fund to help rebalance its economy in the wake of public spending cuts.

'There's no doubt that the impact of public sector cuts will be severe,' says Laura Woods, Director of Teesside University's Department of Academic Enterprise (pictured). 'The next few years will be a challenge for the North East.'

'Two years ago, at the height of the banking crisis, Teesside University drew up a 16-point action plan to help businesses and individuals through the recession. Working with partners like further education colleges, we aimed for simple, straightforward support.'

'Our achievements show that it pays dividends to work with us – we can deliver real, bottom-line benefits to businesses. By providing direct, uncomplicated help to meet specific needs – through training, up-skilling or sharing knowledge – we've helped businesses innovate to compete.'

'Universities such as Teesside have a key role in supporting their regions.'

'Among the most successful initiatives has been our graduate internships scheme for business. With national funding, we were able to offer employers the opportunity to plug a skills or resources gap by taking on a graduate for up to three months at reduced cost. We placed 250 graduates into companies in this way.'

'The interns came out with hugely enhanced work-based skills and experience, while the companies benefited from graduate-level expertise. In most cases the outcome was permanent recruitment – a win-win result.'

The University is now extending its internship programme by three years, thanks to the European Regional Development Fund, and

targeting its new support at small and medium-sized companies in the North East.

'Another recession-busting initiative was funded by the regional development agency, One North East, to provide postgraduate bursaries for highly skilled people who were either unemployed or facing the threat of redundancy. This allowed them to study at master's level and higher – helping the region to hold on to the talent needed for economic growth. We've plans to help another 250 people with postgraduate fees and bursary support over the next few years', says Laura.

'We've also invested in Knowledge Transfer Partnerships, where academics and graduates work closely with businesses in the North East and North Yorkshire to resolve real-life challenges. They're a marvellous way of encouraging close collaboration between academia and the business world. Everyone benefits. The business gets direct access to the University's facilities and expert knowledge; the academic extends their knowledge while contributing to the company's bottom line; and the graduate delivers a strategic technical project and, more often than not, proves so valuable that they're offered a permanent position.'

Entrepreneurship and business start-up is another critical component of University activity. 'As well as creating 72 new businesses in 2009-10, Teesside turned the spotlight on its own students. We launched entrepreneurs@tees to encourage students to think about setting up in business as soon as they arrived on campus at the beginning of the academic year. It's now a year-long programme of creative and stimulating events with full Students' Union involvement. And so we're creating an even bigger pipeline of aspiring entrepreneurs', says Laura.

And the University is a major economic player in its own right, with around 2,500 staff and nearly 30,000 full- and part-time students supporting an array of suppliers – from everyday commodities, like food and drink outlets, to building contractors and Middlesbrough town centre's retail economy.

'We launched entrepreneurs@tees to encourage students to think about setting up in business.'

'One of the first things we changed, as a result of our plan, was to speed up paying our bills to help suppliers with their cashflow – a small but highly appreciated step to help companies struggling during the recession.'

'And we brought forward maintenance projects around the campus and accelerated plans for a second campus at Darlington. Construction of the campus, opening in September 2011, has helped to stimulate the local economy – and its operation is designed to support business growth in the west of the Tees Valley.'

'The Darlington campus is managed by Teesside University Business School and the top floor houses a corporate training suite which will serve as an important business venue in the town. The campus will be a valuable resource for the business community in Darlington and the surrounding area', says Laura.

'Our focus on meeting employer needs marks us out as a truly business-facing University. We're well equipped to support business with the skills, innovation and know-how that lead to sustainable growth.'

Find out how Teesside University can help your business innovate and grow.

T: 01642 384580

E: business@tees.ac.uk

www.tees.ac.uk/spark

Pie perfection



Teesside University's award-winning Knowledge Transfer Partnerships (KTPs) are the perfect recipe for improved business performance.

They are proving a great way to get academics and talented graduates working on problem-solving issues facing industry – with the knowledge exchange working both ways. Academics test out theories and graduates can get hands-on experience, often directly related to their postgraduate studies. And industry benefits from the latest know-how and research coming out of universities.

Take the North Yorkshire pork pie manufacturer, Vale of Mowbray. They took on Liberty Horner, their first trainee graduate, as a KTP Associate.

Working with the company and her academic supervisor, Dr Liam O'Hare, she helped save the Leeming Bar based company £100,000 by reducing waste during the KTP. She has now been taken on permanently as product improvement co-ordinator.

Sheree Walker, the company's production manager, said Liberty and University experts acted as troubleshooters and 'fresh pairs of eyes'. She recommends the KTP scheme to any business needing help and advice with those need-to-do problems that never seem to get done.

Dr O'Hare, a biochemist and food scientist, said, 'Liberty's done a lot of innovative things off her own back – and together, we've helped the company to introduce some new technology and new ways of working to better measure and monitor quality assurance and quality control. We've also organised an energy audit carried out by the University's CLEMANCE environmental management team.'

Managing Director John Gatenby said, 'We're always striving to make the perfect pie and achieve greater consistency from one pie to the next. Having access to the wide range of resources at the University has been an enormous help. Liberty's been a great addition to the team. She's got a really creative approach and is always looking for ways we can improve the business.'

For more information about working with Teesside University on Knowledge Transfer Partnerships, contact Emma Detchon.

T: 01642 384036

E: ktp@tees.ac.uk

Liberty Horner, right, with Sheree Walker.



> GRADUATE INTERNS MEAN BUSINESS



Tom Howsam, right, with new recruit John Hodkinson.

If at **first** you don't succeed...



Just spend ten minutes talking to Tom Howsam, who set up his own business at the age of 22, and you discover a serial entrepreneur, brimming with ideas.

After graduating with a 2.1 in information technology from Teesside University, Tom teamed up with an old school friend in 2003 to launch THAP, a web development company based in one of the first business units on campus.

Tom made up his mind to go self-employed after a work placement with a big company where he didn't enjoy the office politics. His computer science tutor, Dr Alan Jones, suggested he try working for himself with support from the University's graduate business start-up programme. And so, with his partner Adam Paxton, Tom entered Teesside's answer to the *Dragon's Den*.

At first things went well, despite the fact that Tom and Adam were developing websites on a shoestring. They were simply enjoying being their own bosses.

Then the business started to really take off and the team grew to seven people.

'The jobs were getting bigger, but so were the risks and we didn't protect ourselves properly.

'We moved into new offices at the start of 2009 – just as the recession was starting to bite – and

we were waiting longer and longer to get paid,' recalls Tom.

Adam, as managing director, was taking most of the financial pressure while Tom, the technical director, was trying to complete all the jobs coming in. 'Things were getting really tough and eventually we reached the point where we had to let our staff go', says Tom.

Soon after the redundancies, the pressure eased slightly and enough money came in to complete the outstanding jobs. They cleared their debts and dusted themselves down from the business knockout blows. But it was back to square one for Tom and Adam.

Still good friends, they decided to go their separate ways. Tom worked as a freelancer for another friend, fellow entrepreneur Kevin Mann – he had embarked on an exciting new venture to digitise comic book heroes for mobile phone devices.

In July 2010 Tom reopened THAP as one of the region's most exciting software creation specialists. Having learned his lessons, he is building up the company again. 'In the US they have a saying that you're nobody unless you've had a business failure. The key is to fail fast and then get on to the next big thing – I suppose that's exactly what I'm doing.'

Tom recruited three of THAP's former employees, and the new company is now six-strong. The latest recruit, John Hodkinson, joined THAP full time following a successful graduate internship with them. He gained a first degree in informatics at Teesside and finished off a part-time master's in software engineering while working for the company on an internship.

Now a full-time computer programmer, he says, 'The internship from the University was an ideal opportunity for me to get some real work experience and complete my master's degree. I was quite intrigued when my tutor, Professor Mike Lockyer, came up with the idea and am really enjoying all the development work here at THAP'

THAP is now based at DigitalCity's Boho One business centre and Tom is helping to encourage the next generation of graduate entrepreneurs. A leading light in the Teesside Enterprise Alumni Network, he helped to launch the University's student enterprise initiative, entrepreneurs@tees. He uses his own personal story to encourage students to develop skills and experience for business.

'Running your own business can be tough,' he says, 'but for me, there's nothing else like it in the world.'

Link with Teesside just gets better



A young brand agency launched as the economic recession was starting to bite in the north of England doubled in size last year – and its close links with Teesside University are playing a key part in the company's success.

That's according to founder and managing director, Mark Easby, a Teesside graduate who studied media technology in the mid-90s before completing a multimedia and enterprise master's.

After graduation, Middlesbrough-born Mark worked for a fellow student who had set up a company through the University's graduate business start-up scheme before deciding he wanted to be his own boss and launched Better Brand Agency in 2008.

Now the eight-strong Better team includes five Teesside graduates. As well as Mark, there's creative director, Peter Jones (who studied graphic design); client account director, Paul Bell (design marketing); Simon Scarfe (computer science) and Ryan Crawford (graphic design).

Ryan is the latest recruit. The former Darlington Queen Elizabeth Sixth Form College student was disappointed not to be able to walk into a

graduate job after gaining a first last summer. He spent months stacking supermarket shelves while weighing up his options – he even considered abandoning his beloved North East to seek his fortunes elsewhere.

Then he found out about the University's Graduate Internship scheme, offering suitably qualified graduates a ten-week paid placement with a local company. Ryan's skills were ideal for a graphic designer opening at Better's studio in Stokesley, North Yorkshire and his CV was passed on.

'It was a perfect match', said Mark. 'Ryan's CV stood out a mile – we used his design skills to help refashion our own brand image and website with our creative director. When the internship finished, we were in no doubt about taking Ryan on permanently as a graphic designer.'

Ryan says, 'The internship gave me an insight into an industry that's difficult to replicate outside the real commercial world. It's a great way to let a company see what you've got to offer and an opportunity to find out whether the company is right for you. Without this scheme, I would have

probably been forced to leave the region to get a graduate job.'

As for Mark, he is delighted with his recruits from Teesside and says, 'Part of our success is down to a close working relationship with the University which has a very strong reputation for producing top-quality computing, design and media graduates who now make up more than half our staff. We've been expanding throughout the recession and now have clients all over the North East and Yorkshire, including the Institute for Digital Innovation. We've just designed a website for them. So, it's a partnership that works both ways.'

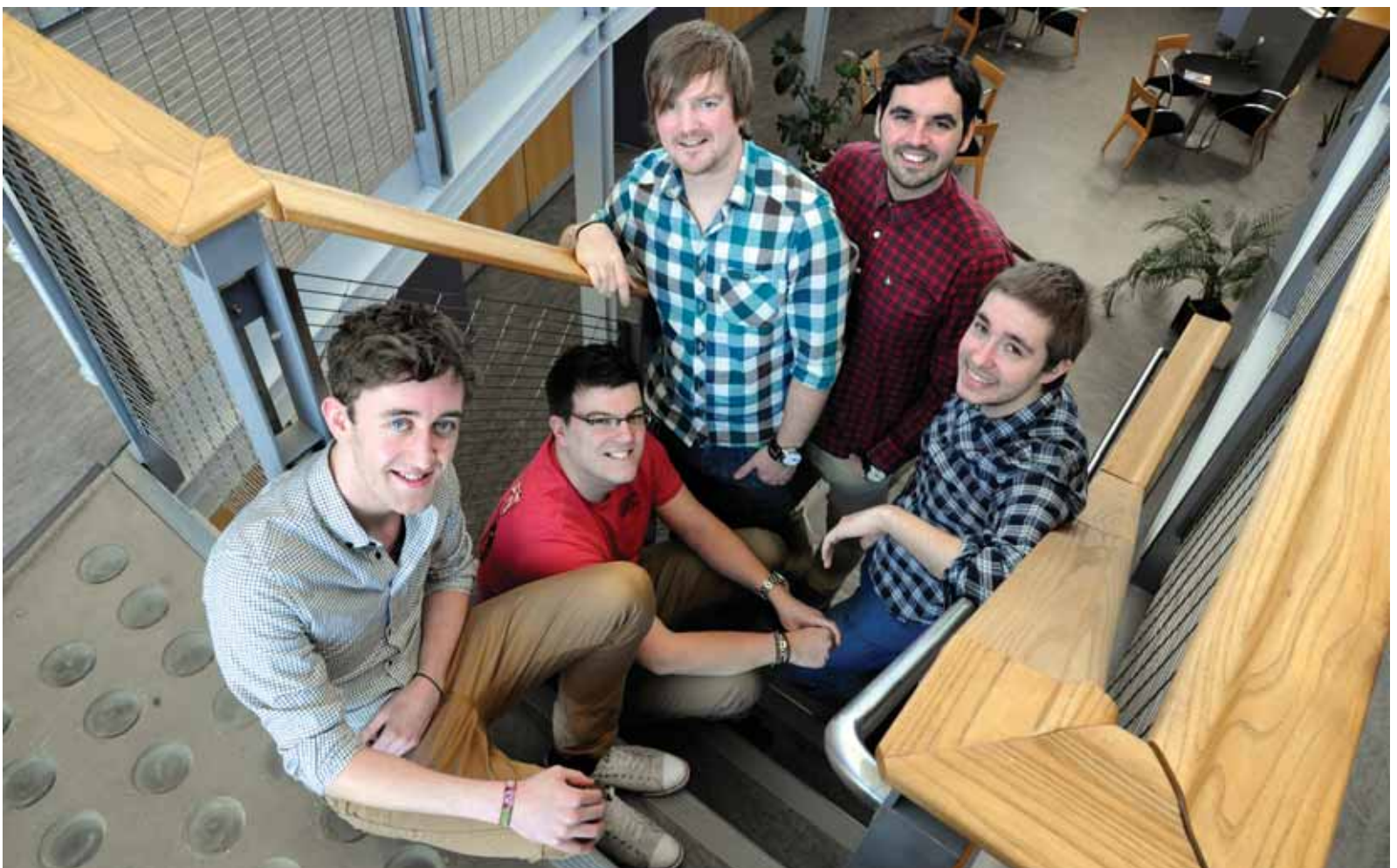
Teesside University is now running a second graduate internship scheme, which is open to North East businesses with up to 250 employees.

For more information about Teesside University graduate internships for North East companies:

E: employmentpathways@tees.ac.uk

T: 01642 384409

Pictured left to right, Ryan Crawford, Paul Bell, Peter Jones, Mark Easby and Simon Scarfe.



Double standards

Higher standards or more scandals? Government changes at a local level could cut both ways. HUW RICHARDS unearths the full story from Michael Macaulay.



The government's localism agenda runs the risk of exposing local councils to a fresh wave of scandals, says the author of two significant forthcoming reports on corruption in the UK.

For Michael Macaulay, Professor of Public Management at Teesside University, pictured, the reports commissioned by Transparency International complement earlier work on the effectiveness of local government standards committees.

As Professor Macaulay says, 'The two reports have to be seen together. One is a survey of corruption in the UK while its sister project looks at the National Integrity System and how well 13 institutional pillars of public life, such as parliament, local government, police and the judiciary are set up to prevent any corruption occurring.'

Examining corruption across this range of institutions leads him to firmly reject the contention of a 2007 European Union report on public sector corruption across Europe that 'corruption in the UK occurs mainly at the level of local government'.

He argues that other sectors, notably the prison service and police, are far more vulnerable and points to improvements in local government integrity enabled by the work of Standards for England. 'During the last ten years we've had nothing like the infamous 'Donnygate' scandal, which led to over 60 investigations and 35 successful prosecutions of fraud and corruption within Doncaster Council. The case was crucial in developing the local government integrity framework.'

But he believes that abolishing or downgrading institutions that have brought about this improvement will lay local government open to fresh abuses. The abolition of Standards for England is only part of the story.

The Local Authorities (Model Code of Conduct) Order will be downgraded from statutory to voluntary, a move Professor Macaulay describes as extraordinary. 'I'm not aware that any previous code of conduct has been taken off the statute books.'

The parallel downgrading of standards committees strikes him as straightforwardly contradicting the government's declared intentions. 'It is part of the Localism Bill, yet it takes a local element away. The committees have been very effective as a means of external scrutiny.'



Worst of all, in Professor Macaulay's eyes, is the abolition of the Audit Commission. 'The whole element of public audit, which has been with us for more than 200 years, is being lost. A council will now in effect be choosing its own auditors – it creates a huge potential conflict of interest.'

'The combined effect of all of these measures is that the gates will be wide open for anybody who wants to 'do a Doncaster'.'

He has similar fears for the prison service – its anticorruption service was reduced in size and it lost its chief executive in August 2010. While local government changes will destroy a system that works, Professor Macaulay argues that 'cost-squeezing' in the prison service compounds an existing pattern of complacency about corruption.

He points to estimates that there were approximately 1,000 prison officers – an average of seven per prison – involved in corrupt activity in 2006. Much of this was related to a drugs market worth £100m, with prices ten times higher than on the street.

Yet the official line continues to be that there is no problem – that drugs and mobile phones are only brought in by prisoners' families. Macaulay says, 'Prisoner surveys make it clear that alongside families, officers also play a huge part.'

Complacency in the prison service contrasts with huge improvements in the police. 'Over the years the argument was that it was a matter of a few bad apples in an otherwise honest service. In the 1990s it was much worse than that. But the response over recent years has been sophisticated and effective. Every force has an anti-corruption officer who reports every three years to the government's Serious Organised Crime Agency while the Independent Police Complaints Commission pursues every allegation against an officer.'

'At the same time,' he warns, 'the risk to other police staff is a matter of concern. This is not a matter of bribes, but of access to information. Knowing what the police are up to, or what your rivals are up to, is hard currency within organised crime.'

Will spending cuts kill the **Big** Society?



The government's Big Society vision for Britain implies an expanded role for the voluntary sector – but will it be able to fulfil those needs? HUW RICHARDS gets some answers from Tony Chapman.



David Cameron's Big Society is more than just an empty slogan. But his vision of volunteers filling space left by public services is likely to fail because of the policies of his own government, says a leading voluntary sector expert.

Tony Chapman, Professor of Social Policy at Teesside University, has studied the sector for three years in a Third Sector Trends study sponsored by the Northern Rock Foundation. Funding was recently renewed for another two years.

Professor Chapman says, 'As we learn more about where spending cuts will fall, it is becoming clear that they will have a significant impact on the ability of charities to maintain current priorities, never mind fill the gaps left by withdrawing public provision. The sheer speed at which these things are happening, in a climate where cuts will come fast and furious, is destabilising in itself.'

Charities themselves, he points out, derive a considerable proportion of their income from the

state. 'Nationally, 39% of voluntary sector income comes from the public purse – both at national and local government levels. In the North East, where the public sector is larger, that rises to 49%.'

The cuts come at a time when charities are already working hard to maintain their income. 'There is a decline in corporate philanthropy and giving. Individual lives are increasingly private and inward looking – with less disposition to devote time and income to helping others.'

Professor Chapman believes that the underlying Big Society vision fails to acknowledge these wider societal changes. 'It looks back to a paternalistic model from the 1920s and 1930s when better-off people, mainly married women, gave their time to help those less fortunate than themselves. More women now work, and people are working for longer – so the pool of volunteers is smaller.'

But, at the same time, there are some positive shifts. 'Young people are more likely to volunteer

than they once were – well-educated young people often volunteer when they're at university or on gap years – and many build their CVs through this kind of activity. It's more of an instrumental approach – but it is bringing more people into the volunteer market.'

He also believes that the government's spending cuts will be a setback rather than a disaster for the sector. 'There are areas, like welfare to work, where the government will almost certainly want voluntary agencies to run programmes. And the sector as a whole has a long tradition of flexibility and coping with adversity.'

But, as he points out, there is considerable variation within the sector. 'Many charities are based locally, serve specific needs and are wary of government agencies, with 60% saying they don't want to do contracting work for government.'

David Cameron during his speech on the Big Society to social entrepreneurs at Somerset House



Weight **worries** for mums-to-be

Being seriously overweight during pregnancy increases dangers for both mother and unborn child, but little is being done to help obese mums-to-be, as LIZ LIGHTFOOT finds out from talking to Teesside researcher Nicola Heslehurst.



Maternal obesity has more than doubled over the last two decades, with one in six pregnant women now facing extra risks to themselves and their babies.

The proportion of women classified as obese on first contact with the maternity services went up from 7.6% in 1989 to 15.6% in 2007, according to the first England-wide study of around 620,000 births.

More than half the women who die in pregnancy or childbirth are obese or overweight. Being seriously overweight increases the likelihood of conditions such as cardiac disease, diabetes and pre-eclampsia, and can be a contributing factor in stillbirth, congenital anomalies and prematurity.

But very little is being done nationally to support women in achieving a healthy weight before bearing children, according to a leading researcher in the field.

Once obese women become pregnant there are still things they can do to minimise the potential for complications for themselves and their babies, such as healthy eating and moderate levels of physical activity. Despite the potential risks, there is no strategic public information campaign, says Dr Nicola Heslehurst from Teesside University's Health and Social Care Institute.

Dr Heslehurst's study of births around the country – published in the *International Journal of Obesity* 2010 – found wide regional variations for maternal obesity, ranging from just over 13% in London to nearly 22% in the West Midlands.

She went on to lead a team of academics from the Universities of Teesside, Newcastle and Durham on a research project on the provision of clinical and support services for obese pregnant women.

The study, funded by Public Health North East and published in the journal *Midwifery* last summer, found improvements to obesity services at North East maternity units over the last four years. The advances related mainly to health and safety, such as the provision of more suitable equipment, including sturdier beds and operating tables.

However, the lack of services to help mothers tackle their weight problems had still not been addressed, and there was a lack of partnership working between public health and maternity services. No weight-gain guidelines were in place, for example. 'Mothers were being told they were putting their babies at risk and were then left to deal with it themselves, largely due to a lack of national guidelines for this type of advice and support for women,' says Dr Heslehurst.

The lack of weight-management services and weight-gain guidance made it difficult for midwives to discuss obesity with women during pregnancy. 'Midwives seek to build up a good relationship with women and they struggle to know how to initiate discussions with them about their weight as it is such a sensitive issue,' says Dr Heslehurst.

'There is an urgent need for obesity training for midwives and better communication between the public health and maternity services,' she says.

Lessons could be learned from the development of smoking cessation services during pregnancy, she suggests. Midwives participating in the study felt that the national drive for smoking cessation with its structured training, support and funding had worked successfully, whereas previous local initiatives without that level of strategic support had failed.





Lost in translation?



How often does top-class research languish unused in a report? How frequently do policy makers bewail the fact that researchers have asked and answered the wrong questions? A recent international conference held in the North East aimed to narrow the seemingly unbridgeable gulf between those working in academic 'ivory towers' and those labouring at the 'sharp end' where services are delivered.

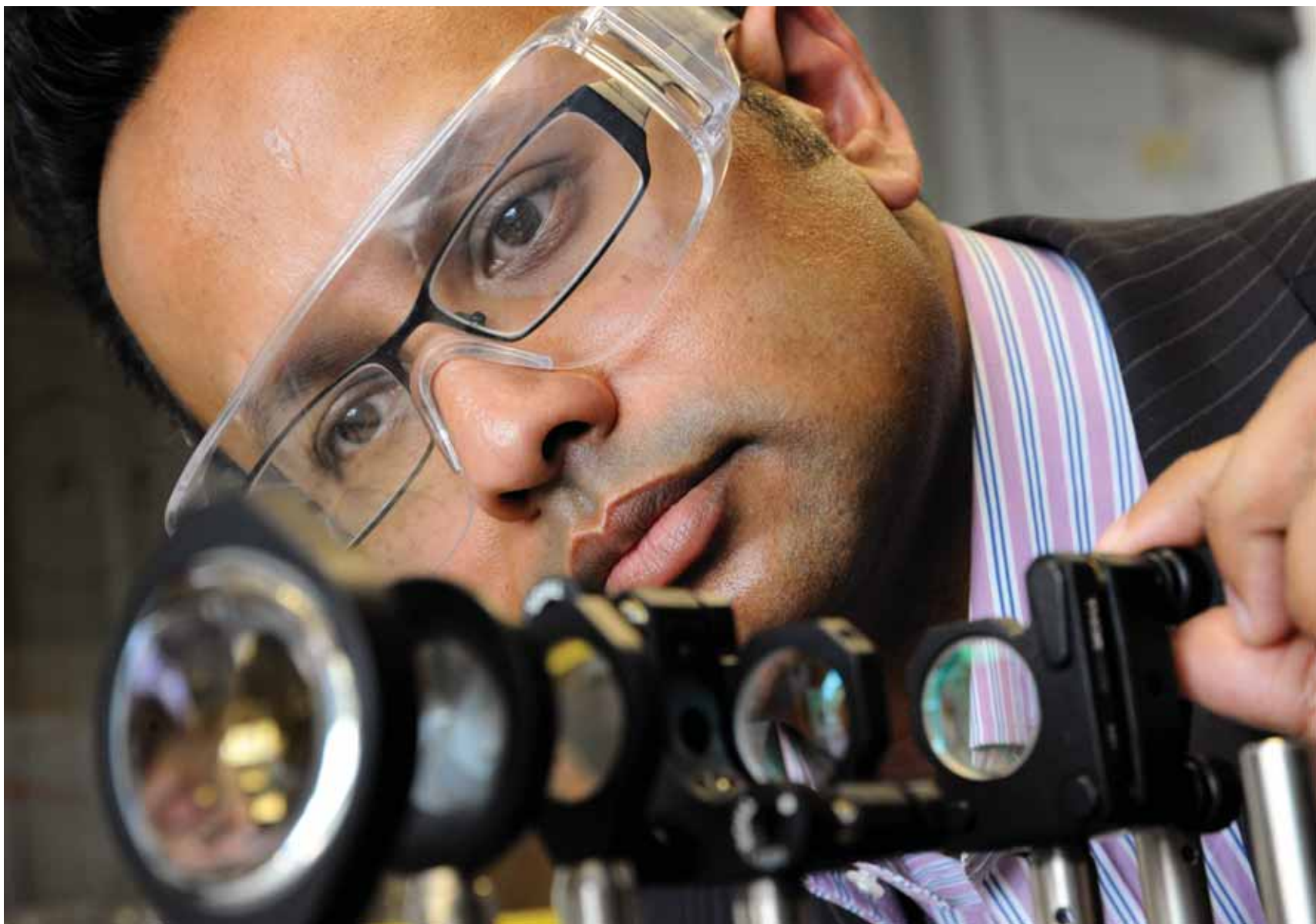
The conference was organised by Fuse, an exciting collaboration between the five North East universities and their service partners, which aims to improve the health of people living in the region. It attracted national and international participants. Professor Mike Kelly, Director of the Centre for Public Health Excellence at the National Institute for Health and Clinical Excellence (NICE) was among the speakers.

Janet Shucksmith, Professor in Public Health at Teesside and Director of the University's Health and Social Care Institute, said, 'The North East provides one of the best laboratories for studying health problems, given the large numbers of heavy smokers, teenage pregnancy rates and high rates of childhood obesity. We can help tackle these issues by working more closely with policy and service partners, ensuring research results are fed back effectively and acted on.'

Teesside's newly appointed Professor in Knowledge Exchange in Public Health, Rosemary Rushmer, said, 'Fuse aims to play a major part in the developing public health landscape. We're committed to this and have appointed a knowledge exchange broker to work across academic and practice boundaries, and a communications officer to help make sure key messages are not lost in translation.'

Detecting the fat **burning** zone

When Meez Islam, a physical chemist at Teesside University, chanced upon his old Oxford University tutor, it was the start of a research collaboration lasting nearly a decade. NIC MITCHELL finds out more.





A new device has been developed to pinpoint the moment when a sweaty session down the gym finally starts to pay off, by detecting when the body has used up its supply of food energy and switches to breaking down fat instead.

The fat-burning breathalyser works by spectroscopically picking up tiny changes in the levels of the acetone molecule in people's breath, which is given off when the body starts to burn fat rather than food.

And one of the scientists behind the research, which has led to a commercial agreement between Oxford and Teesside universities, is Dr Meez Islam, a member of Teesside's Technology Futures Institute.

Dr Islam's research specialism is absorption spectroscopy and he has been a regular academic visitor to Oxford University since he bumped into Professor Gus Hancock, his erstwhile physical chemistry tutor, at a conference in 2002.

Professor Hancock's Oxford group is internationally renowned for developing and applying a novel and highly sensitive spectroscopic technique called cavity enhanced absorption spectroscopy (CEAS).

As well as the commercialisation of the new fat-burning breathalyser by Oxford Medical Diagnostics, a spin-out from Professor Hancock's research group, the long-term collaboration has led to cutting-edge research by Dr Islam and his team at Teesside that has significant potential for a variety of applications.

Absorption spectroscopy is widely used in many fields – from finding out the composition of stars to measuring levels of air pollutants. CEAS makes absorption spectroscopy more sensitive by using an optical cavity formed by two high-reflectivity dielectric mirrors to increase the path's measurement length – making it possible to detect much smaller chemical concentrations.

'A normal wall mirror reflects about 90% of the light falling on it, whilst a dielectric mirror may reflect more than 99.9%,' explained Dr Islam. 'An optical cavity formed by these mirrors allows light to be reflected about 1,000 times. This means we also gain a thousand-fold increase in sensitivity.'

'The work with Professor Hancock's group has influenced my main research area at Teesside. I realised early on that these experiments were too expensive to be replicated at Teesside – so I had the idea of using high-intensity light-emitting diodes (LEDs) as the light source and a cheap spectrometer as the detector.'

'Although at the time it seemed a slightly crazy idea, Gus helped me develop a prototype – and it

actually worked. I've since refined the technique at Teesside. It is generally known as LED broadband cavity-enhanced absorption spectroscopy (LED-BBCEAS).'

With support from Professor Zulfiquar Ali and the University Research Fund, Dr Islam has been able to perform some pioneering experiments that mean the technique can be applied to liquids as well as solids.

'I was fortunate to have an extremely capable PhD student, Nitin Seetohul, to work on it. We did very challenging experiments on a very modest budget – yet we've been able to demonstrate the first application of LED-BBCEAS to liquids.'

'Separately we have made the most sensitive liquid phase absorption measurement reported in academic research literature. And we've shown the first application of BBCEAS to a high-performance liquid chromatography system – one of the most widely used separation techniques in analytical science.'

'I'm proud that we've been able to do these cutting-edge experiments at Teesside, while getting our work published in the leading analytical chemistry journals. We have a paper that is one of the most downloaded papers within the *Analyst* journal so our work seems to be making an impact in this area.'

The BBCEAS experiments are ongoing and Dr Islam believes any analytical technique which uses absorption spectroscopy could benefit from BBCEAS application. 'Currently we're refining the technique to improve sensitivity,' he says, 'but we're also trying to extend the measurement wavelength into the analytically important ultraviolet (UV) region by using UV LEDs and appropriate mirrors. Working with Professor Ali and his group, I am also applying BBCEAS to microfluidic devices and microplate readers.'

The applications are diverse. Breath testers have been in development for years, but the sensitivity of the new system means it can detect acetone and other analytes at sub-10 parts per million. 'The technique could be used for non-invasive diagnosis and monitoring of diseases such as diabetes.'

Dr Islam is named as a co-inventor on the patent underpinning the device, which has been exclusively licensed to Oxford Medical Diagnostics. 'Ultimately we hope to develop a handheld device that a diabetic can breathe into, so they don't have prick their finger for a blood sample to monitor their glucose levels. Much less pain, much less distressing.'

European **enterprise** initiative welcomed



A major region-wide initiative to boost North East business involvement in research, development and innovation, particularly in conjunction with European partners, is being led by Teesside University.

The Enterprise Europe Network (EEN) is part of a Europe-wide consortium funded directly from Brussels. It will see the University working with the Centre for Process Innovation (CPI) and Newcastle Science City to help companies increase competitiveness and productivity by promoting access to innovation and knowledge transfer services.

'It will also support involvement in European Framework research programmes,' explains Laura Woods, Director of the University's Department of Academic Enterprise. 'As well as offering an innovation enquiry service to business, EEN activities will include finding new supply chain partnerships, sourcing finance for new projects, commercialising new technologies and providing quick access to information on EU markets and policies', she says.

The University's Vice-Chancellor, Professor Graham Henderson, is delighted that Teesside is leading the EEN. 'The partnership with CPI and Science City creates an excellent platform for helping regional businesses to reap the bottom-line benefits of leading edge research and innovation', he says.

For more information please contact David Pratt, Head of the University's Regional Office

E: david.pratt@tees.ac.uk
T: 01642 384413

> DIGITAL TEESSIDE

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Around the **globe** in just one day

Simon McKeown's digital art has won Wellcome Trust support for the way it challenges many of the stereotypes commonly associated with disabled people. Here the award-winning Teesside lecturer talks to NIC MITCHELL about what his work seeks to achieve.



Over half a million people saw huge images displayed on landmark buildings around the world as Teesside-based artist Simon McKeown's work went global in a single day, celebrating the essential qualities of disabled people.

The synchronised screening in 17 countries of Simon's video art installation, *Motion Disabled*, coincided with the United Nations' International Day of Persons with Disabilities on 3 December.

From Saudi Arabia to Sri Lanka, Liverpool to London and from Arlington, US, to Argentina, people stopped and stared as avatar-like images appeared inside and outside public buildings.

Creating *Motion Disabled* has been an artistic challenge for Simon and his team since he won a Wellcome Trust award to make an animated film using state-of-the-art Hollywood technology highlighting the 'intrinsic beauty' of disabled people and the uniqueness of their movements.

'3 December 2010 made the long hours filming disabled actors with motion capture equipment and all the post-production work seem like a welcome reward', said Simon, Reader in Animation and Post-Production at Teesside University. 'We estimate that *Motion Disabled* was seen by around half a million people globally on just that one day', he said.

Simon – in Liverpool for the big day – saw his *Motion Disabled* clips screened on the iconic George's Dock ventilation building of the Mersey Tunnel during Liverpool's high-profile DaDaFest International 2010. DaDa is one of the largest disability and deaf arts festivals in the world – it helped organise the worldwide screening of *Motion Disabled* with VSA, the Washington DC-based international organisation on arts and disability.

In between TV appearances, Simon was presented with the DaDaFest's International Artist of the Year Award in recognition of his work highlighting the need for society to appreciate the true worth of disabled people.

He says, 'We need a more intelligent, articulate and original approach to the cultural presentation of disability and disability imagery and I hope my work is challenging to audiences.'

Motion Disabled features disabled actors with varying disabilities whose motions were mapped on to 3D models – or avatars – to replicate the actors' movements using the same technology that created characters such as Gollum in the *Lord of the Rings* film trilogy.

When Simon was featured on BBC Two's *The Culture Show*, Garry Robson, artistic director of DaDaFest International, commented that he is an



Simon McKeown

'One of the important aspects of *Motion Disabled* is the innovative way it challenges the negative stereotypes of disabled people so often portrayed in the media.'



LIVERPOOL



PRISHTINA



BUENOS AIRES



WASHINGTON DC



artist to watch. 'In *Motion Disabled* he puts a disabled person in a motion capture suit that captures their movement. Simon is asking us all to take away culture baggage and look at pure movement: what does it say?'

Although an artist first and foremost, Simon hopes that, by working with partners such as the VSA and DaDAaFest, he can stimulate debate about the worth and rights of disabled people globally – sparking conversations and changing attitudes about disability, art and culture. 'One of the important aspects of *Motion Disabled* is the innovative way it challenges the negative stereotypes of disabled people so often portrayed in the media.'

Clare Matterson, director of medical humanities and engagement at the Wellcome Trust, is among his avid supporters. She describes *Motion Disabled* as 'a beautiful celebration of the human body in all of its forms'.

Dr Simon Stobart, Dean of Teesside University's School of Computing is another fan – he's delighted with the support and interest *Motion Disabled* has received, nationally and internationally. 'To stay at the forefront of the animation discipline, it is essential that our staff are engaged with industry and world-leading research projects like this.'

Simon has just completed two short films, a live action for the UK Film Council and *All for Claire* – an animation featuring Claire Cunningham, an internationally acclaimed disabled performer. Both are doing the film festival circuit.

His next artwork is already taking shape in the form of *Motion Disabled: Face*. He will use much more complex facial motion-capture technologies to focus on disabled faces and voices, presenting an alternative view of facial perception and personality.

He hopes to include a disabled American hip-hop artist and Liverpool comedian Liz Carr in this new work. 'I want to ensure that disability art moves into the mainstream arts world. Up to 20% of the world's population has some level of disability and we should be representing that in our culture.'

Simon praises the disabled actors involved and the first-rate creative team at Teesside University. 'It was a brilliant team effort.'

> *Motion Disabled* has recently started a five-year installation as part of the All About Us exhibition at At-Bristol, one of the UK's leading science-based museums and one of *The Independent's* top ten UK family attractions. The exhibition is supported by the Wellcome Trust.

> STOP PRESS

Simon has been commissioned as part of the Cultural Olympiad to work on a large-scale development of *Motion Disabled* as part of a groundbreaking programme to celebrate arts and culture by disabled and deaf artists.

Simon's project is one of 13 new commissions announced by the London 2012 Cultural Olympiad, the UK Arts Council and the British Council for the Cultural Olympiad Unlimited programme. The working title for Simon's contribution is *Motion Disabled-Olympic*, recording 'the signature movements of disabled athletes' motion'. Simon intends to combine 3D software to create large inflatable sculptures using rapid prototyping techniques. The paralympic body shapes and actions will be presented as large models and will be played out on both large screens and smart phones, challenging our perceptions of human motion and body shape.

>DIGITAL TEESIDE

How was your day?

If your partner is fed up with you moaning about work, help may be at hand through an amazing piece of interactive software that does more than just provide a sympathetic hearing. DAVID WILLIAMS finds out more from Marc Cavazza.



It's a companion, an adviser and a life coach, but it's also virtual and powered by artificial intelligence.

It's called an Embodied Conversational Agent (ECA): a system which makes human-computer dialogue more realistic and acceptable by mediating it through on-screen characters animated in real-time.

But, while previous research mostly developed them as personal assistants, a new generation of ECAs is much closer to being able to engage in natural conversations with their owners and so establish personal relationships because they can respond to human emotions.

'The breakthrough has come from recent progress in affective dialogue systems', explains Professor Marc Cavazza, Director of the Digital Futures Institute at Teesside University, whose team developed the system. 'It means that a companion agent can now depart from simple task-based dialogue.'

Professor Cavazza's team recently demonstrated the new virtual companion at the biennial ICT conference in Brussels, where conference-goers were presented with an ECA engaging in an open conversation, albeit on a limited number of topics.

'To demonstrate its potential, we choose an everyday situation that would support conversation with some affective content', says Dr Cameron Smith, who helped develop the system.

'We opted for a scenario in which the user, a typical office worker, returns home and complains about her day in the office. We refer to this as the 'How was your day?' scenario.

'The companion does more than provide a sympathetic hearing as one might expect from such an application', adds Professor Cavazza. 'It also demonstrates a true understanding, not only of the events described by the user, but also of her own attitude towards the situation.'

'The system works by appraising its owner's reaction to the event reported, so as to determine whether it should comfort the user or provide some advice instead.'

The prototype currently supports some 50 work-based topics of conversation, such as meetings, company restructuring and relationships with colleagues.

The system analyses what the user is saying for its emotional content, both at speech and text level, and then assigns an emotional category to each event description. This is used to determine the appropriateness of the user's emotional reaction to the events. The companion then uses an affective strategy to influence the user.

Depending on its analysis, it may choose to comfort the user or provide some warning about the possible evolution of the situation. The sequence of utterances is designed to convey gradually the message to the user, for instance by initially expressing agreement and empathy. Each is also associated with emotional content which is expressed by real-time animation of the companion's facial expressions and gestures.



More information about the project can be found at www.companions-project.org.

The work was funded by the European Commission as part of the Information Society Technologies (IST) programme.

New Readers for computing



Teesside University's Digital Futures Institute, led by Professor Marc Cavazza, has been strengthened by the appointment of two new Readers to the School of Computing.

They are Dr Shengchao Qin, whose main research interests lie in formal methods and programming languages, and Dr Suiping Zhou, who is investigating large-scale, complex systems which typically require modelling, simulation, computing and visualisation, such as multiplayer online games and military training systems.

Dr Qin studied at Peking University's School of Mathematical Sciences and worked for the United Nations University, the Singapore-MIT Alliance and as a lecturer in computer science at Durham University before coming to Teesside.

Dr Qin has been the principal investigator on two EPSRC-funded research projects worth over £740,000. He said, 'In recent years, my main research has been in software verification, especially automated verification of memory safety and functional correctness of Java/C-like programs. I wanted to join Teesside University because of its active Formal Methods and Programming Research Group and I am very pleased with the supportive research environment here.'

Dr Zhou studied flight control systems at Beijing University of Aeronautics and Astronautics and worked for the China Aerospace Corporation for two years before doing post-doctoral research with the Weizmann Institute of Science in Israel. He then worked for Nanyang Technological University in Singapore for ten years.

'I focus on two related areas – firstly, how to maintain the interactivity and consistency of the system under the constraint of large network latency and huge resource demands; and secondly, how to efficiently and effectively represent the behaviour of various objects, such as avatars, to enhance the fidelity of virtual environments and to enrich users' experience.'

Dr Zhou has published extensively and shares research interests with Professor Cavazza in the fields of virtual environments and human-computer interaction.

His research has been supported by a number of grants including one valued at S\$954,000 (approx £470,000) from the National Research Foundation of Singapore. Dr Zhou is currently associate editor of *International Journal of Computer Games Technology*.

Digital help for student nurses



Wade Tovey (left) with Dominic Lusardi and a life-size dummy used to test student nurses which has been recreated online for nursing students to practice on.



A new Teesside digital company looks set to revolutionise the way student nurses are trained in practical skills before taking vital exams.

Launched a year ago as a University spin-out, PSEON has already created innovative software which is attracting a lot of interest from health professionals. St John Ambulance is hoping it will help with the first-aid training it delivers to 900,000 people each year.

The company is the brainchild of Wade Tovey, director of EPICC – the School of Health & Social Care's enterprise arm – and Sam Harrison and Dominic Lusardi, two Teesside computing graduates who have run their own digital enterprise, Animmersion UK Ltd, for nearly five years.

The new interactive 3D online training tools for nursing students are currently designed to help first-year students prepare for their clinical exams, which they must pass before their placements.

Wade said, 'Tests on over 800 students who used the software to practise skills and procedures before doing four practical clinical exams led to a 50% reduction in re-sits.'

'As our system sits between virtual reality and basic e-learning, it's easy to use. It tells the students what to learn, helps to teach them and then tests before they actually sit the exam,' explained Dominic.

Graeme Measor, a senior lecturer in the School, said, 'It's a fantastic way to augment student learning. I only wish this had been available when I was a student.'

PSEON's business concept was first recognised when it won a Teesside heat in the prestigious North East Blueprint Awards in 2010.

> DIGITAL TEESSIDE



In the digital spotlight



Teesside built its fame on the back of iron and steel, but it is now one of the country's major centres for manufacturing digital talent.

So says Dr Jim TerKeurst, Director of the Institute of Digital Innovation (IDI) based at Teesside University, who points to the remarkable success of the DigitalCity Fellowship scheme.

Since receiving a major cash boost of nearly £6m from the European Regional Development Fund, One North East and the University, the Fellowship scheme – which provides facilities and mentoring to turn fledging business ideas into commercial undertakings – has launched over 160 companies.

'We were turning out a new company every week and passed the 100-mark last summer,' says Jim. He has played a key role in Middlesbrough's DigitalCity initiative since coming to Middlesbrough, via Dundee, from North America four years ago.

'Together with our partners at Middlesbrough Council and throughout the region, we have turned the Tees Valley into a world-class centre for digital innovation.

'Many of the new enterprises have been launched by our graduates and staff, and are in the fields you might expect – computer animation, web design and advertising. But more and more

are in new areas like nanotechnology and forensic science (see on page 5). We've also got a new company offering online support to help organise big events, such as weddings.

'We've recently helped Tees Valley Dance to develop engaging software to help teach dance to young children which is going to be launched commercially.'

Jim says it's 'fantastic' to be based within Teesside University and in Middlesbrough. 'We're situated in the Phoenix Building on campus and facilities are just perfect.

'The University has a strong industry focus. It really helps that it puts support for enterprise right at the top of its agenda.

'It's home to some of the best students in the digital domain and we're doing some great research in our area. I love the fact that we are helping to retain graduate talent in the region, playing a key role in economic regeneration here in the North East of England.

'We have the annual Animex festival, which has become one of the top international events for animation and computer games in the world. And it's great to see how AnimexPro in Newcastle, aimed at business people, is taking off.

'We've also hosted the second TEDx event this year and done a lot to help communities and

individuals move into digital media through initiatives like our Digital Champions.'

Jim is in no doubt that as steelmaking returns to Teesside and the chemical industry weathers the storm of the recession, digital technology is an excellent third string to the area's manufacturing bow – and one that is getting considerable national attention.

'We're certainly on the map, leading an international project to bridge the gap between universities and the creative industries', said Jim.

This two-year Atlantis programme is funded to the tune of €140,000 by the EU and the US Fund for the Improvement of Postsecondary Education. It will see Teesside University work with colleagues from Högskolan Gävle in Sweden and the Universities of Iowa and South Carolina in the US.

The findings will be delivered to the US Senate and the European Commission's Culture and Education Directorate General to help inform policy development in educational partnerships with the creative industries, in turn making students more employable.

'Teesside was chosen to lead the project because of its reputation as a leader in digital fields like visualisation and DigitalCity's success in helping graduates launch new companies,' says Jim.



Atlantis partners, left to right, Rebecca Frierson from the University of South Carolina, USA; Dan Berkowitz, from the University of Iowa, USA; Jim TerKeurst from Teesside University's Institute of Digital Innovation and Totte Jonsson, from Högskolan Gävle, Sweden.

> NATIONAL IDENTITY

Dilemma

for the English Defence League

Nigel Copsey talks to HUW RICHARDS about the rise of the English Defence League and the implications for social cohesion.



The English Defence League (EDL), whose demonstrations have been the flashpoint for violence in the last 18 months, has reached a crossroads in its short existence, believes a leading academic expert on Britain's far right.

Professor Nigel Copsey, who has written extensively on the British National Party (BNP), was commissioned by inter-faith group Faith Matters to examine the EDL. He believes it is potentially more dangerous to social cohesion than the BNP, but that it is also possible that it has reached the limits of its impact.

One option for the EDL is to become a political party. Professor Copsey, who heads Teesside's Institute for Design, Culture and the Arts, says, 'It is an option they may explore. If they could find a charismatic leader they could have a considerable appeal to a white working-class constituency marginalised since the creation of New Labour.'

There is, he believes 'considerable potential for an anti-Muslim, English nationalist, anti-immigrant party.'

But the political route is problematic, 'There are already a number of English nationalist parties – and the EDL leadership lacks any real political experience.'

Nor is a link-up with an existing party likely to be fruitful. 'An attempt to form links with UKIP did not lead anywhere. UKIP members are seen by EDL supporters as much too middle class, and they aren't keen to associate with people who support the EDL's confrontational approach.'

Still less likely, in spite of superficial similarities and a parallel appeal to disaffected white, male, working-class youth, is co-operation with the BNP.

Professor Copsey says, 'Some people call the EDL fascist, but it isn't ... It has no real ideology, although racism is certainly expressed on marches. Nick Griffin, the leader of the BNP, considers it a Zionist front.' Contrasting viewpoints were demonstrated following David Cameron's attack on multiculturalism.

Griffin claimed it showed Cameron as a sympathiser with BNP views, while, Professor Copsey points out, the EDL reaction reflected its roots in anti-Islamic protests in Luton. 'The EDL



A member of the right-wing EDL gestures during a rally in Luton

Carl Court / AFP / Getty Images

leader Tommy Robinson said he had no problem with race, his objection is to Islam.'

The EDL has become a serious problem for the BNP. 'Under Griffin the BNP has withdrawn from the streets, to seek respectability and electoral success. The EDL has filled the vacuum they have left. Quite a few BNP activists feel envious and want to get back on the streets.' A further source of envy was Robinson's recent appearance on *Newsnight*, generally better received than Griffin's performance on *Question Time* in 2009.

So where does the EDL go now? Professor Copsey says, 'While they claim upwards of 70,000 followers on Facebook, they have only been able to mobilise 3,000 - 4,000 at demonstrations. There's no evidence that they are losing support, but momentum matters in politics and unless their numbers grow, they might run out of steam. What would make a difference would be another event like 7/7 or 9/11 or a serious escalation of violence around one of their demonstrations – there is a clear strategy of trying to provoke Muslim youth into retaliatory violence.'

'There are already a number of English nationalist parties – and the EDL leadership lacks any real political experience.'

Being British



When you grow up in a multiracial community, what does it mean to be British? How do young people define Britishness and being a good citizen? A major research study using avatars in a virtual *Second Life* world is set to find out, as LIZ LIGHTFOOT reports.



Fish and chips and a cup of tea are the most characteristic eating habits of the British, according to a survey of teenagers.

Beyond diet, the principles of free speech and the qualities of tolerance and patriotism were the most frequently cited by 700 students in the North East when asked to define what it is to be British.

The survey was the first stage of a unique £250,000-funded project seeking to uncover what young people really think about life in a multicultural society and what it means to be a good citizen – all through a virtual *Second Life* world.

Hundreds of teenagers from different ethnic groups at more than 20 schools will build on-screen avatars to help them tackle sensitive issues, such as immigration and terrorism. They will be provided with different scenarios – such as refusing residency to a Gurkha who fought for

Britain, or deporting a Somali refugee who has lived in the UK for more than 15 years, with children who were born here.

The project, sponsored by the Research Councils UK Digital Economy Programme, is led by Stewart Martin, Principal Lecturer in Education with Teesside University's School of Social Sciences & Law. It is being overseen by a multi-faith steering group with Estelle Morris, the former education secretary and life peer, as its patron.

'There is no doubt that there are young people in our society who feel marginalised', says Stewart. 'They were born here but don't feel part of British society. Like many people in Britain today, they feel that our society doesn't have a shared inclusive view of what it means to be British.'

Attitudes towards people of the Muslim faith in the wake of 9/11 will be explored. Nayyera Aslam, the research associate working on the study, says there has been a change in atmosphere following the bombings in the US and London. 'I am a British Asian born in Middlesbrough and very proud to be British. But people in my community feel that there is still some suspicion – that they have to defend being a Muslim, explaining that our holy book preaches peace, not terrorism.'

Six in ten of the students, aged 12-19, who took part in face-to-face focus groups for the preliminary survey late last year were white. Two in ten were Pakistani and the rest described themselves as mainly other Asian or African.

Asked about the impact of their ethnic origin on their lives, 34% said it had an impact some of the time and 11% said it was important a lot of the time.

They took a moral view of being a good citizen, with more than eight in ten feeling it had to do with personal behaviour and character traits such as being helpful, polite, honest, respectful, law abiding, trustworthy, fair and tolerant.

Such qualities were more important, they said, than knowledge of why the Huguenots left France for Britain in the 16th and 18th centuries and whether more boys than girls smoke in the UK – both typical questions in the Home Office's Life in the UK tests that foreign nationals must pass before being granted British citizenship.



> SOCIAL DEPRIVATION

Worklessness across the generations

Researchers in Teesside and Glasgow are investigating the popular idea that young people in areas of high unemployment adopt anti-work attitudes and resist looking for work. NIC MITCHELL talks to Tracy Shildrick to find out more.



When Gordon Brown was Chancellor, he surveyed the British landscape and remarked, 'In every area of this country (there are) young people who have never worked, long-term unemployed men and women who have given up hope.....For too long, in too many deprived areas of the country, there has been a destructive culture that 'no-one around here works'.'

That was back in 2003 when the country was said to be enjoying an economic boom. Is it any worse now after the longest recession for a generation? Or have some in the poorer communities of Britain drifted into an anti-work culture, which locks them in a vicious cycle of poorly-paid jobs followed by long periods on benefits – communities where sons and daughters are content to follow their parents into welfare dependency?

A new project, funded by the Joseph Rowntree Foundation, seeks to find out by challenging commonly held views shared, not just by tabloid headline writers, but by some welfare policy makers and some of those in government.

'The term intergenerational cultures of worklessness (IGCW) is used to explain away the inability of widespread policy interventions to effectively help some of the most economically marginal groups back into work', says Professor of Sociology at Teesside University, Tracy Shildrick.

She is leading the research team, which includes her colleague, Professor Rob MacDonald from Teesside's Social Futures Institute, and Professor Andy Furlong and research associate Johann Roden from Glasgow University.

'We are very sceptical about whether there really is this intergenerational culture of worklessness', says Professor Shildrick. 'So far we've found exactly the opposite – people want to work despite all the problems associated with short-term, low-paid employment.'

The new research builds on earlier work in Middlesbrough funded by the Joseph Rowntree Foundation, which has supported earlier studies in this area.

Professor Shildrick says, 'Despite its apparent simplicity and obvious popular appeal, IGCW is far from a straightforward idea.'

'Whilst one might look to workless households as a starting point, it suggests that in some areas a culture of worklessness and poverty of aspirations have developed. Cultural orientations and values have shifted to embrace anti-work attitudes which infect coming generations.'

The research will inevitably engage with questions about the intergenerational transmission of poverty and disadvantage, a key theme in current government policy.

'Our work impinges on many policy arenas, for example, educational disaffection and criminal justice policies and the resurgence of interest in questions of social mobility, social justice and equality of opportunity.'

'It is argued that young people are feeling the worst impacts of the recession and fears are rising over a 'lost generation'. We hope this project will provide new and timely evidence about the ways in which young people think about and respond to worklessness within their families.'

In-depth qualitative data is being collected from across different generations in 20 families who have experienced long-term worklessness in deprived areas of Glasgow and Teesside. The research is due to be completed in November 2011.

'Early analysis of the data suggests that this project will provide robust evidence to directly challenge some of the current popular and political rhetoric around IGCW', says Professor Shildrick.

'Our hope is that clearer understanding of the issue will help to change at least some of the dominant policy and practice thinking around the long-term unemployed. And it will help to challenge some of the more general derogatory views of those in receipt of welfare.'

The aims of the research are:

- > to critically interrogate the concept of IGCW, moving beyond the rhetoric
- > to interrogate the statistical evidence on IGCW
- > to provide a critical case study of aspirations, work commitment and experiences across and within families with experiences of long-term unemployment in both Teesside and Glasgow.

Trapped by low-paid work



Rising numbers of people face poverty as they move from one short-term job to another, often incurring debt as a direct result of low-paid insecure work, according to research for the Joseph Rowntree Foundation.

The role of the low-pay, no-pay cycle in recurrent poverty shows that unemployed people have a strong work ethic, actively look for work, and are prepared to take jobs even when they are poor quality.

The report, published at the end of 2010, was result of work led by Teesside University Professor of Sociology, Tracy Shildrick.

She said, 'The timing could not be more appropriate as the government is looking at ways of encouraging people into work by, amongst other things, cutting benefit payments. Most people on benefit are already very poor, so it's not entirely clear what the result of the government's intended action will have apart from making people even poorer.'

The report showed that the casual and increasingly insecure nature of available jobs is exacerbating problems, especially for the 'missing workless' – people who move in and out of work with short periods of unemployment without claiming benefit, or getting the support they need to progress.

'They are trapped in long-term insecurity and poverty,' said Professor Shildrick, who argued that most of the support offered by statutory and voluntary agencies is aimed at helping the longer-term unemployed.

And it is not just the young, or the unskilled who are suffering. While low qualifications play a role, people with higher education qualifications are also sometimes affected.

Joseph Rowntree Foundation Chief Executive, Julia Unwin, said, 'The research highlights the importance of recognising that while work can and should help people out of poverty, in too many cases it does not...For work to be the route out of poverty, it needs to pay properly, provide opportunities for progression and give stability.'



> ENVIRONMENT

Green **impact** on the landscape



Large-scale renewable energy projects are seen as the solution to many of the planet's problems – but what effect will they have on the landscape? And how will they change people's lives?

These questions are being addressed by a national team of experts, including Dr Richard Lord, Reader in Environmental Geochemistry & Sustainability at Teesside University.

Richard, a member of the University's Technology Futures Institute, was chosen because of his expertise in the use of brownfield sites to grow energy crops. His involvement is supported by a grant from the Natural Environment Research Council.

'As the country moves towards viable large-scale renewables, we will need large tracts of land for everything from photovoltaic solar power arrays and windfarms – to growing grasses and willow for power stations, or crops for biofuel', he says.

'Each of these has an impact, of course. How do they affect our aesthetic perception of the landscape, for example? Do they change what people feel when they look out of their windows?

'And what about the conflicting use of land? Are we producing renewable energy at the expense of food? And what impact does the large-scale growth of energy crops have on the water table or ecosystems? All these issues need considering.'

The project also involves specialists from Lancaster, Leeds, Birmingham, Warwick, Reading, Nottingham, Loughborough and Cranfield Universities and Imperial College, London.

The research team, ranging from scientists to geographers and economists, will examine what would happen to a test site in Marsden Vale in Bedfordshire if it was used for a range of large-scale renewable activities.

'We know renewables will transform the way we produce energy', says Richard. 'Now we need to understand how they will change the world around us.'



European environment award for Teesside expert



The European Commission has selected a project led by an environmental expert at Teesside University for one of its Best LIFE Environment Project awards.

Dr Richard Lord, Reader in Environmental Geochemistry & Sustainability, received the award plaque in the European Parliament during the LIFE for our Environment conference in May.

The award is for the BioReGen Project which investigated ways of reusing brownfield sites for renewable energy crops in the North East of England.

It was selected as one of the 14 best EU-supported LIFE Environment projects completed throughout Europe in 2010.

Richard said, 'I am delighted for all the project's partners over the last six years, who include staff at the University's Technology Futures Institute, the National Renewable Energy Centre (NAREC), the North East Community Forests and CJ Day Associates. It is great to see all our hard work being recognised in this way.

'We are now actively engaged with a number of major industrial landowners who are implementing the results of the research in commercial projects. It's a real conundrum as to how to produce the biomass we need to reduce carbon emissions without affecting food supply.

'We found that reed canary grass grows well on a variety of marginal or brownfield land types which are not currently being used. The European

Commission particularly likes the way we were able to replicate the project and spin out real applications with real impacts.'

The LIFE programme is the European Commission's key financial instrument for the environment and supports the implementation and updating of EU environmental policy.

The conference reviewed the LIFE programme's achievements to date and future needs and opportunities in this field, particularly in view of the European Union's next financial framework (2014-20). Richard joined a panel of international experts for the LIFE for our Environment conference session looking at new solutions to environmental challenges in the public and private sectors.



Dr Richard Lord with research associate Richard Green at a brownfield reed canary grass trail near the Tees Barrage and (above) among the wind turbines near Sedgfield, County Durham.



Building a more energy efficient **future**

Researchers at Teesside are joining forces with academic and business partners all over Europe to put energy consumption at the top of the agenda when regenerating neighbourhoods, as NIC MITCHELL finds out.



Saving energy is not usually the first priority for town planners and regional governments looking to revitalise urban areas. They are more likely to be focused on attracting new jobs or reducing crime.

But as oil and gas supplies dwindle and electricity costs soar, the buildings and communities of the future will have to be far more energy efficient.

That's the thinking of the European Commission, which is looking to launch a €4 million research and development project to help reduce energy consumption by using information communication technologies (ICTs).

The proposed SEMANCO (Semantic Technologies for Carbon Reduction in Urban Planning) project will see European academics and construction experts working together to find solutions to soaring energy costs.

Leading Teesside's contribution will be Professor Nashwan Dawood, Director of Teesside University's Technology Futures Institute, and senior research fellow, Dr Tracey Crosbie, who have just completed a related research project for the European Union.

'What we are proposing would build on the results of our earlier IntUBE (Intelligent Use of Buildings' Energy Information) project, which saw a ten-strong team from Teesside collaborate with scientists and European partners to find smarter ways to use energy information in both existing buildings and new constructions.

'Our new research work at Teesside will focus on developing intelligent simulation and energy predictive models for both urban and regional levels', explained Professor Dawood.

'Europe wants to reduce energy consumption by 20% by 2020, and with

40% of the total energy consumed by heating and running buildings, this is clearly a critical area', he said.

Dr Crosbie says, 'Drawing on lessons learnt through IntUBE, the new three-year SEMANCO project will widen the research to look at saving energy not just in individual houses and offices, but in whole neighbourhoods, and even cities and entire regions.

'There's going to have to be a trade-off between social, economic and environmental constraints. Planners will need to think about the environmental impact when they look to renovate urban areas.

'There are already frameworks to encourage architects to design more energy-efficient buildings, but one of the main challenges is that the people who commission new building projects rarely live or work in them and are not interested in the cost of running them. That's going to have to change.'

The SEMANCO project aims to use ICTs to:

- > automate the identification and classification of buildings for energy analysis
- > identify and visualise 'energy-use hot spots'
- > assess the potential of strategies to reduce CO₂ emissions
- > trade-off social economic and environmental constraints
- > extract guidelines to apply to other areas and projects
- > predict future demand as a result of demographic and economic changes.

> NEWS ROUND UP

Leading on the waterfront



Innovative companies recognise the importance of skills to their performance. NIC MITCHELL finds out how Teesside University is working with PD Ports to develop its leaders and managers.



Dave Douglas left school at 16 to join the Army, but nearly three decades later he is graduating from Teesside University with a Foundation Degree in Leadership and Management designed and developed with his employers, PD Ports.

The one-time soldier left the army to become a stevedore at Tees Dock at the age of 27 and this summer he was one of 14 port employees completing the two-year part-time degree.

'The course was a great confidence booster and nearly all of us would like to top up the foundation degree to an honour's degree', he says.

Dave is now training officer for PD Ports, which has port-based operations throughout the UK.

'My job involves training all the dock and logistics operatives, but apart from my time in the military 30 years ago I had had no training in leadership or management. That's until I was asked by the company if I wanted to do the foundation degree in 2009.'

The company – one of the area's largest private-sector employers – worked with Teesside University Business School to tailor the programme to its specific needs.

David Robinson, PD Ports Group Chief Executive Officer, is delighted by the progress of the first cohort. 'The degree programme provides a unique personal development opportunity for employees like Dave to develop and enhance their skills, allowing them to more effectively lead and manage people within the organisation. We are very proud of Dave's achievement, and all the other staff involved in the course. They have demonstrated impressive commitment to developing their roles and skills.'

Dave says it has certainly broadened his outlook and he now fully understands the importance of inter-departmental dependencies. 'There's a lot of learning to do, but I have found it worthwhile, especially in terms of building on my weaknesses rather than my strengths to do my job effectively.'

'Instead of just firefighting, I now look at the bigger picture and try to find the root cause of any problems rather than just waiting until they happen again. I hope it's made me more of an inspirational leader and I now take criticism much better. I was always afraid of failure in the past.'

The University is delighted by the programme's success and looking forward to the second cohort of port employees starting later this year.

Programme leader Andrew Dale says, 'We've designed this programme around the needs and expectations of PD Ports. It builds on our experience of successfully developing the Foundation Degree in Leadership and Management with the North East Chamber of Commerce for which we won the *Times Higher Education* Outstanding Employer Engagement Initiative Award in 2009.'

'The participants have been excellent. Now we're developing the programme with PD Ports. We're also working with other employers in the North East and with organisations such as chambers of commerce outside the region.'

For more information about the Foundation Degree in Leadership and Management contact Suzanne Withrington, Account Manager at Teesside University Business School.

T: 01642 738518

E: s.withrington@tees.ac.uk

Teesside engineers **global** ambitions



Teesside University's goal of being the world's leading provider of high-quality flexible education for the engineering industry has won plaudits from industry and training leaders.

Speaking after the launch of Teesside University Open Learning (Engineering), George Ritchie, Senior Vice-President of Sembcorp, said, 'It's very important that we have a University here focused on industry. In my view there's never been a better time to push this type of vocational open learning into the workplace. Most companies are very streamlined these days, so day release is very difficult especially when you've got talented people working shifts.'

'But this approach to open learning gives you the best of both worlds. You can help your people improve themselves and still deliver the bottom-line performance for your company.'

The University's new initiative builds on the success of Cleveland Open Learning Unit (COLU) which, over its 25 years, supported 30,000

students and employers in engineering with distance-learning style courses in areas such as liquid natural gas process technology, process engineering and petroleum technology.

Professor Caroline MacDonald, Deputy Vice-Chancellor (Learning & Student Experience), said the University was creating new learning opportunities for engineers and engineering students.

And just in time, according to Dr Stan Higgins, Chief Executive Office, North East of England Process Industry Cluster, who says the average age of people working in Teesside's chemical industry is 54. 'Just to maintain what we've got, we will need 10,000 new technically qualified people in the next ten years. With £8 billion of investment earmarked for the region, we will also need a further 8,000 in the industry if we want to keep pace with all these investments.'

For more details go to www.tees.ac.uk/tuole

Studying and working at the same time changed Eric Garbutt's life – as he explained at the launch of Teesside University Open Learning (Engineering).

He left school at 15 to start an ICI apprenticeship and became an instrument engineer for BP across the UK and in the Middle East.

But in his early 40s, he realised he needed higher qualifications to progress. He signed up with the Cleveland Open Learning Unit studying part time for a Higher National Certificate in Instrumentation and Control Engineering.

'I couldn't stop working to go to college. I had a young family to support and was doing 12-hour shifts offshore.'

The hard work paid off and Eric, pictured below, was then accepted on the MSc Project Management at Aberdeen University.

With the two qualifications under his belt in time for his 50th birthday, his career took off again. He is now Project Director and AMEC's representative on the ZADCO Project UZ 750 – the world's fourth biggest oil and gas project which involves building four artificial islands to service oil extraction in the Gulf.



A good death?

We may be living in a more open society but one subject remains taboo. Death, for most people, is too distressing to contemplate and so it lies pigeonholed in a box at the back of the mind to be opened when the time comes. LIZ LIGHTFOOT explores how Teesside researchers are helping to break the silence.



Such is the widespread reluctance to talk about the last part of life, that researchers must tread carefully. When people were stopped on the streets for a survey about death and dying, one in six of those who declined to take part said they were uncomfortable with the subject.

The survey was part of a unique research study that seeks to break the silence and inspire debate about what makes a 'good' death. In an age when services for the terminally ill have become increasingly medicalised, the Compassionate Communities Project at Teesside's Institute of Health and Social Care is looking at ways of handing some control back to the individual.

Perhaps the most poignant finding of both the regional and national surveys undertaken at the start of the project last year was the mismatch between the place of death people desired and where they were likely to die. In Middlesbrough, for example, 60% of people questioned want to die at home but, according to official figures, only 21% get to do so.

By contrast, only 15% said they would prefer to die in hospital when in fact 60% spend their last days or hours there. Death in a care home – the recorded place of death for 13% was chosen as a first preference by no-one.

'Limited, expensive hospital facilities are taken up by individuals who could just as well be cared for at home. If you want to spend your time in front of the television with your family and pets

then there should be the resources and support to make that happen', says Edwin Pugh, a consultant in palliative medicine and a visiting professor at Teesside.

People consulted nationally through street surveys, face-to-face interviews and focus groups agreed that they wanted their death to be as dignified and pain-free as possible. Beyond that, few had consulted relatives about how they wanted to spend their last days. One of the most voiced concerns the desire to lessen the burden of grief on relatives and friends.

Only one in ten had voiced a preference as to where they would want to be cared for at the end of life and half had no will or card for organ donation.

'Normalising death by being more open about it allows individuals to take control of their lives and make choices about the care they want and how they hope to spend the remaining part of their lives. It enables them to make plans to help those left behind', says Professor Pugh.

'Some people feel safer in hospital, others long for their own surroundings. If people choose to die at home and have the support of the local health and social services then it can be a lasting comfort for their families', says Mary Browne, whose mother and father died at home within six months of each other.

'I felt very peaceful about it afterwards. I was able to organise carers coming in and the diet and prescriptions without having to give up work.

My employer did not even know about it.

'By living with them in the house, I could provide the love and company through little things such as combing my mother's hair in the morning or modelling a new jumper I had bought, for her opinion. No matter what your age or your circumstances, you want life to be as good as it can be.'

The Compassionate Communities Project was developed following the publication in 2008 of the North East's 25 year public health strategy which has 'A good death' as one of its ten themes.

Following consultation, a Charter for End-of-Life-Care was produced by Public Health North East's Regional Advisory Group for a good death.

Now the Teesside project, funded by a £200,000 innovation grant from the Strategic Health Authority North East and additional sums from the University, is the hub of work to implement the Charter in the North East and establish the region as a test bed for the rest of the country.

'It is important for the health and social services to work together and share resources. But if there is to be a real cultural shift then it must be within the context of a caring, compassionate community that is able to talk about death and dying', says Professor Pugh. Hence the project has employed community development workers as a main plank of its approach.

Project workers, Letty Mather and Liz Paterson, are liaising with faith and community groups that



Picture taken by Ikuko Tsuchiya, photography lecturer at Teesside University.

may be able to extend more support to people in their homes and seeking to promote the concept of the good neighbour. Both primary and secondary schools have welcomed the project and are working with staff on ways of breaking down the taboos which inhibit discussion. Local museums have also added their support and are exploring how death and dying can be the focus of a number of exhibitions and learning resources. Teesside University students have signed up for the challenge of capturing photographic images that best portray compassion at the end of life.

Debbie Hall, the project leader, is researching the structural barriers that can get in the way of a good death. Employers are being encouraged to draw up policies for time off or flexible working for carers of the terminally ill. Meanwhile, services which should be in place to support those at the end of life are being examined in a number of small studies. The project is continuing to explore and evaluate the training opportunities for those working with people at the end of life and whether they are delivering the step change in attitudes that is required to integrate services in a way that will provide seamless support.'

'Much can be done to improve the quality of the end of life if people show compassion and do not write people off as soon as they get a terminal diagnosis or are clearly in decline', says Janet Shucksmith, the Director of the University's Health and Social Care Institute.

'People who have a limited time to live can suffer a social death before their real death because others don't know how to talk to them and think they are no longer interested in life', says Professor Shucksmith. 'In many cases they can continue to play a valuable role at work if they choose to. Even in the later stages, when they are confined to bed, there are many things that can improve the quality of life beyond the medical', she says.

'Training for care home staff, for example, could prevent very sick people being rushed to hospital as medical emergencies for nosebleeds or minor changes in their condition.

'Money could be switched from hospital beds to community nursing and care, but it is not all about resources. People first have to open the box labelled death and lift the taboo.'

'Normalising death by being more open about it allows individuals to take control of their lives.'

> NEWS ROUND UP

Treasuring our **steelmaking** heritage

As SSI's takeover of Teesside Cast Products reignites local steelmaking, HUW RICHARDS talks to Joan Heggie about a project to preserve the area's defining industry.



The rebirth of steelmaking on Teesside increases rather than diminishes the importance of preserving records and memories from this industry's proud past.

And now, thanks to a successful project run jointly by Teesside University and Teesside Archives, the region has an unparalleled facility to do just that.

Led by Dr Joan Heggie, Research Fellow in the University's Social Futures Institute, a team – including archivists, conservators, education officers and volunteers – painstakingly transformed a chaotic mass of documents into a unique archive about Teesside's glory days of steelmaking.

The collection includes the commercial archives of most of our significant local steelmakers as well as 20,000 photographs, 16,000 engineering drawings and 100 cinefilms. The end result is a readily accessible physical archive in central Middlesbrough and an online treasure trove for scholars or in fact anyone with an interest in Teesside's industrial heritage.

The £1.6m project is also about engaging the community, particularly former steelworkers – encouraging them to tell their 'steel stories' and pass on their memories. Over 200 events were organised over the life of the project, reaching more than 5,500 people. And school pupils are better informed about the region's industrial past, thanks to its extensive schools programme, which delivered 80 workshops in 37 schools, involving 1,956 pupils and 118 teachers across the four Teesside boroughs.

Now the project's impact continues through its online catalogue and free-to-download resource packs. The volunteer programme will also have far-reaching effects as a result of its resource developed for anyone interested in Teesside's industrial history. Dr Heggie says, 'We trained around 90 volunteers. The skills they learnt will not be lost at the end of this programme but will continue in association with the Friends of Teesside Archives.'

The project was supported by a £250,000 Heritage Lottery Fund grant and financial backing

from Corus, Community trade union, Royal Academy of Engineering, Arts and Humanities Research Council, Economic History Society, Museums, Libraries and Archives Council, Technology Strategy Board, as well as Teesside University and the four local authorities.

The archive's successes were celebrated at two receptions, one in Middlesbrough Town Crypt and the other in the House of Commons in 2011. Dr Heggie proudly told guests at both events how all the project's objectives had been met. 'The achievements of the team will be welcomed by researchers, local or international, for a long time to come, whether in Teesside, Taunton or Tokyo. The key is having the full catalogue online, plus a new website for Teesside Archives, devised by the project archivist.'

Search the catalogue at:
www.middlesbrough.gov.uk/teessidearchives

Find out more about the project at:
www.britishsteelcollection.org.uk



Rural communities feel the digital divide



Poor internet access is leaving some rural communities feeling disadvantaged compared to their urban neighbours, according to new research. MICHELLE RUANE finds out more.

The Digital Villages project – led by Teesside University's Social Futures Institute and the East Cleveland Community Development Group, Saltburn – focused on the use of computers, the internet and social networking in East Cleveland communities.

Among those interviewed for the research, which was supported by a grant from the Big Lottery Research Fund, was Terry Hatton, landlord of Moorsholm's Toad Hall Arms pub.

A Londoner, he worked for a global shipping organisation before moving to the region with his family two decades ago. 'In the past when people moved to a village, they would ask about transport or local schools. These days they are just as interested in internet access', he said.

Poor broadband access in rural villages impacts on businesses and access to online services, with research interviewees saying they felt disadvantaged and 'falling behind' their urban neighbours. 'Some people thought they were the only ones having problems, but the research has

got people talking about how they can join forces to approach service providers about the problems they are facing', said Terry.

Paul Davies, of the East Cleveland Community Development Group, led the project with Professor Eileen Green, Carrie Singleton and Steve Thompson from Teesside University.

Paul said, 'The project has helped us understand the nature of ICT use and how it can be a real positive in people's lives. But equally it has shown some of the problems, issues and shortcomings that must be addressed.'

Professor Green said, 'This has been an exciting opportunity to work with local communities in producing research findings in an area which is top of international policy agendas and close to people's hearts.'



At the Toad Hall Arms, from left to right, Carrie Singleton, Terry Hatton, Paul Davies and Eileen Green .



Cold War volunteers needed



Civilian volunteers from the Cold War era who signed up to protect the UK in the event of World War III, are being invited to take part in a new research project.

Dr Matthew Grant, a senior history lecturer at Teesside University, has been awarded funding by the British Academy to record first-person accounts of former members of the Civil Defence Service Volunteer Group, which included the Auxiliary Fire Service.

The force was set up in 1949 and disbanded in 1968 by Harold Wilson's Labour Government because of costs. Until now the experiences of enlisted volunteers have never been recorded.

Dr Grant said, 'Half-a-million people joined over a 20-year period – a significant collective act of voluntary action. But it's an aspect of British history that's been forgotten.'

'They lived in fear of nuclear war – is this why they joined? There are no records about their experiences or what they thought about the Cold War period. We know there was a gender dynamic – more women joined than men. Why? And it was largely a rural phenomenon. There was also a social aspect to joining which I'd also like to explore.'

Interested former volunteers can contact Dr Grant directly. The research results will appear in an academic article to be published in 2012.

E: m.grant@tees.ac.uk

T: 01642 384075

Or write to Dr Mathew Grant at the School of Arts & Media, Teesside University, Middlesbrough, TS1 3BA.

Musical dress sense

It's just not what you hear but what you see, according to music psychologist Noola Griffiths. LIZ LIGHTFOOT finds out more.



Few, but a handful of utopian thinkers, believe that clothes do not matter and that people can wear what they want because their qualities will shine through regardless.



When dress-down Friday was all the rage in the 90s, a series of surveys in the US and the UK found that staff who turned up in casual clothes were 50% more likely to act in a rude, silly way and were significantly more likely to be flirtatious.

But beyond the behavioural findings, is there any evidence that judgements made about an individual's actual performance are linked to the clothes people choose to put on in the morning?

That was the question posed by Dr Noola Griffiths, pictured left, a musician and research associate with Teesside University's Social Futures Institute, working on the applied psychology of music.

She set out to determine whether a panel of 30 male and female music students and members of a philharmonic orchestra was influenced by the outfits worn by female soloists.

She chose four violinists of similar ability, age, size and physical attractiveness and then filmed them performing the same pieces of music in a long concert dress, a short, strapless nightclubbing dress, jeans and against a dark background with a spotlight picking out movement through reflective tape on their joints. The video recordings were then dubbed with a rendition performed by a fifth violinist to ensure uniformity in the music played.

Performances by soloists in the nightclubbing dress were judged to be significantly less proficient for both technical ability and musicality

than those in a concert dress. Casual jeans were marked lower than both the concert dress and the method of highlighting limb movement, but above the nightclub dress.

'So posh music should equal posh dress. But the implications go further than dressing appropriately for auditions or taking music exams. The results may present evidence for the continuation of the mind/body split in which women's creative skills are overshadowed by a focus on their bodies,' says Dr Griffiths. 'Women in clothes that reveal their body shape are judged to be less musical and skilful, even by other musicians.'

'The findings suggest that physical appearance is strongly linked to perceptions of ability. Women wishing to project a body-focused image should note that this may have a detrimental effect on perceptions of their musical ability', she concludes.

The paper, published in the research journal *Psychology of Music*, has already created waves and was picked out for praise by Ben Goldacre, *The Guardian's* chaser of 'bad science', who featured the project as an example of how research should be done.

'Noola Griffiths is an academic who has published a cracking paper on what women wear', he said. 'I don't know how you'd apply the same tools to every workplace. But I'd like to see someone try.'



‘The findings suggest that physical appearance is strongly linked to perceptions of ability.’

> NEWS ROUND UP



Is the answer in the **hand**?



As a rugby player in his youth, Jim Golby was familiar with the concept of 'good hands' – the attributes of a player who is a particularly dextrous handler of the ball.

As an academic, Dr Golby, head of research in sport and exercise at Teesside University, has been fascinated by the concept of mental strength, and exasperated by the failure of British national teams lacking in this quality.

He has been researching the area for over a decade and believes one answer may lie in the hands - but examined from a slightly different perspective.

His research suggests that a decisive aspect of mental strength might be the relationship between the index (second) and ring (fourth) fingers. What might sound like an old wives' tale is instead firmly rooted in serious science.

'A much shorter second finger is thought to be caused by increased exposure to testosterone in the womb. We tend to associate testosterone with aggression, but controlled aggression is an important part of sporting performance. It's also associated with a number of psychological features that contribute to mental toughness, such as optimism and the ability to cope with pressure', says Dr Golby.

This raises the question of whether it's possible to test for mental strength.

Dr Golby says, 'We have valid, reliable measures that have proved able to predict performance in sport.'

In a recently published study, using 122 participants who had their finger ratios measured and completed personality and aggression questionnaires, it was found that those with lower finger ratios were more likely to demonstrate significantly higher levels of mental toughness and demonstrate higher levels of sporting achievement.

The results are of potential interest to organisations, such as football clubs, to help them assess sporting potential. However, it shouldn't lead to young sports people who possess an unpromising finger ratio being summarily discarded.

As Dr Golby points out, 'It indicates a predisposition which needs considering alongside many other factors. And other research has shown that there are techniques for increasing mental toughness once a potential weakness has been diagnosed.'

Work by Teesside University researcher Tom Gibbons, a senior lecturer in sport and exercise and member of the Social Futures Institute, was highlighted in a celebration of the 30 most significant articles in the journal *Sport in History* to mark its 30th anniversary. The article looked at how football and English national identity have been interlinked since 1863 when the first Football Association (FA) was formed and football divided into national divisions within the 'United' Kingdom.

Sharing and preserving our research online



TeesRep is an open access digital archive of published research and theses, set up to collect, preserve and disseminate Teesside University's research outputs.

Since the repository's official launch in October 2010 by Vice-Chancellor Professor Graham Henderson, it has grown rapidly. The 2,000th metadata item was added earlier this year: a journal article by Dr Noola Griffiths, research associate with the Social Futures Institute, whose work on 'The effects of concert dress and physical appearance on perceptions of female solo performers' can be found on page 40.

The digital archive is easy to access – with most traffic coming from search engines, such as Google, and via staff profiles on the University's website. By May 2011 around 30% of the collection included full text.

Jane Aiken, Assistant Director (Collections and Resources) in the University's Library, said, 'TeesRep raises the profile of the University and showcases the expertise of its research community through internationally visible research.'

'We're currently working with the Institute of Design, Culture and the Arts to accurately represent art and design research outputs in the repository, increasing the visibility of the University's less traditional research outputs.'

www.tees.ac.uk/teesrep

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Teesside University

Middlesbrough T: +44 (0) 1642 218121
Tees Valley F: +44 (0) 1642 342067
TS1 3BA UK www.tees.ac.uk



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