The University of Brighton has a long and distinguished history of applied research. This serves to sustain and nourish our mission to help form professional and vocational careers. Ultimately, we aim to transform the lives and experiences of people and their environments with research that matters.

Through this publication we aim to share some of the work that we undertake along with its positive effects. We have drawn upon examples of research impact from across the university’s three new academic Colleges of Life, Health and Physical Sciences, Social Sciences, and Arts and Humanities. Articles have been commissioned from a selection of academic project leads, recently appointed professors, early career researchers and newly established research centres.

Our research aims to make a difference at many levels and through different platforms: improvements to individual healthcare, technological advances that make lives safer and simpler, deliberate changes to perceptions and values in society, actions that improve economic performance, facilitating exposure to different cultures and design, and influencing and rewriting policy. Our research permeates individual, societal, regional and global concerns, and leads to positive change and benefits.

The 48 articles in this publication provide just a sample of the wide-reaching benefits of our research. Over the next few years we will be working to make this work more accessible to potential research users and those who may benefit. Further examples of this work may be found on our research webpages alongside the digital materials associated with this publication.

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Pro-Vice Chancellor Research
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COLLEGE OF LIFE, HEALTH AND PHYSICAL SCIENCES
Professor Mukhopadhyay believes that this fundamental and clinical research is just the beginning: helping the health profession, the policymakers and the public understand the implications is equally important, and a major communications programme has seen significant success. “Personalised medicine is a truly novel approach so we need to engage the profession and the public in how it works,” said Professor Mukhopadhyay. “There are several areas, like storing genetic information, which people need to get comfortable with, so informed debate is important.

Asthma is the most common chronic disease in children. Of about 15 million children in the UK, at least one million suffer from asthma, with huge impacts on quality of life and on general health. That’s why the possibility of personalised medicine is such an exciting prospect in terms of improving quality of life and making it part of day-to-day practice. One of the critical areas will be persuading the medical profession to recognise a novel way of managing patients and helping them shift from traditional models of prescribing.”

“We published a proof-of-concept study in 2013, which attracted a great deal of attention,” said Professor Mukhopadhyay. “The trial studied children with an at-risk genotype – ARG16 – to see if they would respond better to alternative medication, which is usually less effective than the standard prescription. The proof-of-concept trial derived from previous laboratory and clinical trials we and others have done, and confirmed our hypothesis 100 per cent.”

A group of commonly prescribed asthma medicines known as beta2-agonists act via a single body molecule in the airway, the beta2-receptor, but these medicines appear to be effective in only a proportion of children with asthma. The team from BSMS led a multi-centre study to demonstrate that children with the at-risk genotype who used a standard inhaler on a daily basis have a 30 per cent greater risk of asthma attacks than those who do not carry the genotype variant.

A low-cost test identifies whether children carry the at-risk genotype. “The genetic test is a very simple ‘spit test’ analysing a small saliva sample,” said Professor Mukhopadhyay. “The cost is the equivalent of less than one emergency visit to the GP, so even a modest improvement in managing a child’s asthma makes the economic argument look compelling.”

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Research led by Professor Mukhopadhyay showed that, in a proportion of children with asthma, this inadequate response could occur as a result of common mutations in the beta2 receptor gene. This has further increased the awareness of the role of this genetic variation on medication responses in children’s asthma among paediatric respiratory physicians in India and other parts of South Asia, and has influenced my practice.

Professor Meenu Singh, Head of Pediatric Pulmonology, Postgraduate Institute of Medical Education and Research, Chandigarh, India
Researchers have developed a lexicographical tool that has helped change the face of dictionary publishing and enabled accurate analysis of language usage around the world.

Not so long ago dictionaries used to be compiled on huge card indexes. Compilers would collect examples of how words were used in different ways and make subjective decisions on their meanings in a range of contexts.

All that is changing and University of Brighton researchers have been at the forefront of providing computational tools that can analyse large quantities of text objectively and keep up-to-date with the fast-changing nature of language in a diverse world.

Beginning in the 1990s with research into enhancement of online lexical resources, Dr Roger Evans and Dr Adam Kilgarriff from the School of Computing, Engineering and Mathematics developed a new approach to lexicography using computer-based statistical analysis of the behaviour of individual words in large bodies of text online.

Using word sense profiles, or word sketches, they created a computational lexicography tool, which was commercialised as the ‘Sketch Engine’ by Kilgarriff’s company, Lexical Computing Ltd, in 2003, at a time when dictionary publishers were beginning to look at moving online.

Since then the Sketch Engine has been adopted by four of the UK’s five major dictionary publishers. Lexical Computing Ltd is working with Oxford University Press to analyse children’s language and Cambridge University Press to analyse the language produced by learners of English. National language institutes in nine European countries and 200 universities worldwide use it to support language research, dictionary production, language technology products and to enable language teaching. It has allowed users to access information on between 30 million and 70 billion words in 61 different languages. Lexical Computing Ltd now employs staff in the UK and the Czech Republic, along with freelancers in a number of other countries. Half of the company’s business is overseas and it runs training courses around the world.

200 UNIVERSITIES WORLDWIDE AND NATIONAL LANGUAGE INSTITUTES IN NINE EUROPEAN COUNTRIES USE SKETCH ENGINE TO SUPPORT LANGUAGE RESEARCH, DICTIONARY PRODUCTION, LANGUAGE TECHNOLOGY PRODUCTS AND TO ENABLE LANGUAGE TEACHING.
The tool can also be used to highlight the manipulation of language by politicians and advertisers as well as informing policymakers and advertisers about how they can best get their messages across. The chief executive of brand naming company, Operative Words, has described it as the “most powerful naming tool available” and said it was instrumental in information gathering to enable branding techniques and new creative directions for their portfolio.

The Sketch Engine has also been used to substantiate arguments in a pervasive debate about language use in the art world. A 2010 analysis of exhibition announcements, which utilised the Sketch Engine’s search tool, was published in the US art journal Triple Canopy and sparked an international debate on the language of art. This journal article has since become a widely circulated piece of online cultural criticism, sparking further debates on other forums, including Wordpress, Tumblr, Google+, Ikono, Artblog and Artsia.

Dr Evans himself uses the tool in his research on developing computational systems that work with language. He is currently using the Sketch Engine for his work with historians analysing the way language is used in medieval and Latin documents. He said, “The historic documents use lots of archaic or different words such as magister and messuage, words we do not have now. Sometimes they use words we do still use but in different kinds of linguistic structures. The Sketch Engine provides a detailed analysis of the way the words are used, how often they occur and how they differ from modern usage.”

Ultimately, the Sketch Engine allows us to create from the Collins Corpus a true picture of language as it is currently used and gives us empirical evidence on which to base our content. This allows us to claim with confidence that our language reference products are based on language as it is really used and so are the most authoritative available.

David Wark, Senior Publishing Systems and Data Developer, HarperCollins
BETTER LIVES FOR DIABETICS

Diabetes makes a bigger social and economic imprint than almost any other disease. It can ruin quality of life and consumes around 10 per cent of the entire NHS budget. The World Health Organization predicts that more than 30 million people will be diagnosed with type 1 diabetes by 2030, classifying it as a global epidemic. A 2014 report in The BMJ highlighted that more than a third of adults are on the cusp of developing type 2 diabetes. Researchers at the University of Brighton have made important inroads into understanding the disease and were instrumental in creating the world’s first government-funded transplant programme which is transforming the lives of diabetes patients.

People with type 1 diabetes face a daily gamble with insulin and blood sugar levels. Without a normally functioning pancreas, they are reliant on self-administered blood tests to estimate the amount of insulin they will need, day and night, to maintain a healthy blood sugar level.

Having diabetes is a big responsibility for patients and affects their day-to-day lives and routines. As Professor Adrian Bone of Brighton’s School of Pharmacy and Biomolecular Sciences noted, “People with diabetes need to measure their blood sugar and decide how much insulin to inject: too little and their blood sugar will be too high which can lead to diabetic complications. Too much insulin, though, produces hypoglycemia, a dangerous condition which can lead to headaches, nausea, seizures and diabetic coma. For parents this is a very difficult task: they have to administer insulin to a diabetic child at bedtime, hoping they’ve done so accurately so that the child won’t suffer from a hypo episode during the night.”

Type 1 diabetes usually develops in children and young people. Researchers at the University of Brighton have discovered a disease biomarker, late in the progression of pre-diabetes, which has helped to identify how insulin-producing cells in the pancreas are targeted and subsequently destroyed. This research provided the first direct evidence that a common enteroviral infection is capable of triggering development of diabetes in people who are genetically susceptible.
Researchers from the University of Brighton informed the development of JDRF’s Type 1 Diabetes Research Roadmap. Their contribution has helped JDRF to engage with policy makers and parliamentarians, helping us to conduct productive discussions about how to maximise the effectiveness of UK research resources and strengths in order to provide tangible benefits to UK patients, and the UK economy.

Rachel Connor, Head of Research Communication, JDRF

The most effective way to manage the disease is by transplanting new insulin-producing cells. Research at a cellular and molecular level, including research completed by Dr Wendy Macfarlane, also from the School of Pharmacy and Biomolecular Sciences, has played a central part in developing replacement cells and tissues suitable for transplantation. “Ideally, we would offer islet transplantation to every diabetic patient, but availability of transplant material is the biggest limiting factor,” said Professor Bone. “To qualify for a transplant in the UK your diabetes needs to be uncontrollable using insulin injections. For those people who have received an islet transplantation, none of them have subsequently suffered from a hypo episode. The islet transplantation gives them a much finer degree of control, so although they still need to inject insulin, it becomes an almost completely reliable way of getting their blood sugar levels right.”

Diabetes clearly has a big impact on lives and on society, so Professor Bone and his team give significant time to help build understanding of the condition and how it can be managed. “Public understanding and awareness is probably the biggest area we can influence,” said Professor Bone. “With type 2 diabetes in particular, helping people understand what it is, how you get it and what you can do to prevent getting it is vital work.”

Juvenile Diabetes Research Foundation (JDRF) is the world’s leading charitable funder of type 1 diabetes research and the organisation is pushing to increase the amount of high quality type 1 diabetes research funded in the UK.

JDRF delivered a project, with input from University of Brighton researchers, that resulted in the Type 1 Diabetes Research Roadmap. This roadmap helps to show the strengths, weaknesses and opportunities in UK research for further action.

Focusing on young people is centrally important. “We spend a lot of time in schools and we hold an ‘open lab’ every two months where people can come in and chat, and see for themselves the work we’re doing. We’re talking about simple things that can make a fundamental difference. There is a genetic predisposition with type 2 diabetes, but the most important factors are the risk elements of lifestyle, diet and issues such as smoking. Each of these can increase the risk of contracting diabetes by a factor of ten, so it’s clearly vital to get the message across,” said Professor Bone.

Although only two per cent of the population suffers from diabetes, their treatment accounts for 10 per cent of the total NHS budget and the figure is rising. “Type 2 diabetes accounts for nearly nine in 10 cases of diabetes, so if we can prevent it by identifying at-risk people and stopping the development of the disease, we can remove them from the NHS ‘cash register’ for maybe 50 years,” said Professor Bone. “People are living longer but they’re not necessarily living better so anything we can do to help them avoid diabetes gives them a better quality of life and saves the NHS a great deal of money.”


diagram: Islet Transplantation

**ISLET TRANSPLANTS**

*Have been performed successfully on 65 patients between April 2008 and March 2013, with a reduction in severe hypoglycaemic events (>95%) and improved glycaemic control.*

*Of the 65 islet transplant patients, the frequency of severe hypos was, on average, reduced from 23 per person per year to less than 1 per person per year and overall insulin requirement was halved in these patients.*
Psychological stress in patients with breast cancer

Breast cancer is the most common female cancer, affecting one in eight women. Although many risk factors have been associated with the progression of the disease, the effects of psychological stress are just beginning to be recognised. Dr Melanie Flint is leading research that will help to determine the role that stress hormones play in patients’ responses to treatment.

Triple negative breast cancer (TNBC) accounts for approximately 20 per cent of all subtypes of breast cancer. Patients with TNBC are treated with standard chemotherapy treatments, and these patients exhibit shorter disease-free survival, a higher rate of relapse and can develop resistance to standard therapies. Dr Flint’s research examines the impact of stress hormones on the progression of TNBC and patients’ responses to drug treatment. Stress hormones are highly potent and can interact with almost every cell in the body (including normal, cancer and immune cells). Dr Flint’s research has shown that DNA can be damaged as a result of this interaction leading to cell transformation. A diagnosis of breast cancer is a cause of a great deal of stress, which is in itself a significant reason for stress management to be considered early on.

Dr Flint works with women who have recovered from breast cancer/TNBC and has used this to inform the direction of her research. The period of most stress is different for each woman; it may be from the moment of suspicion of breast cancer to the diagnosis, or following diagnosis. Patients experience stress for a variety of reasons: through knowledge that they are high risk, enduring multiple biopsies, indirect stress of family members, as well as fear of pain, sickness and potential end of life. Some patients seek stress interventions such as exercise and positive reinforcement from medically trained individuals.

Each of the women Dr Flint worked with stated that stress was a major factor during their cancer history, and that they felt stress could play a role even in tumour progression and treatment. Dr Flint’s group is also examining the impact of stress hormones in tumour tissue from women with mutations in Breast Cancer (BRCA) genes (women who are at high risk of developing breast cancer). BRCA proteins help repair damaged DNA, and women with these mutations often develop breast cancer at a younger age and have higher stress levels. Patients with breast cancer considered investigations into mutations in Breast Cancer 1 (BRCA1) genes would be critical, due to the added stress of thinking that they could pass on their genetic propensity for the disease to family members. Further, the survivors welcomed discussions of stress with their physician and stress management interventions if offered.

Determining the effects of stress on the efficacy of chemotherapy will have an impact on the potential utility of pharmacological interventions (for example, beta-blockers) or psychological interventions (for example, mindfulness-based stress reduction) and on the correct time point for administration in the disease trajectory for greatest therapeutic effect. The research will impact patients and clinicians, through recognition that stress is a contributing factor for drug resistance in the treatment of breast cancer.

It’s very exciting to work on a (series) of projects that combine the expertise of laboratory based scientists with that of psycho-oncologists in an innovative area of research likely to produce tangible benefits for patients receiving cancer treatments.

Valerie Jenkins, SHORE-C, Sussex Health Outcomes, Research and Education Group

**1 in 8 women will develop breast cancer in their lifetime**

**80% risk of developing breast cancer in your lifetime if you have a BRCA1 mutation**
"Access to water means different things to different people," said Professor Church. "For anglers it’s about protecting their rights as understandably they want to fish the best stretches of water. For paddle sports – non-powered watersports such as canoeing – it’s about getting access to exciting places, usually white water, and it’s about encouraging local clubs and engaging local people. And there’s plenty of evidence telling us that from the health and wellbeing perspective, walking beside blue spaces is even more valuable than enjoying green spaces."

A key outcome from the research has been a fundamental reshaping of voluntary access agreements, bringing together recreational users, landowners and others with an interest in inland water. Using collaborative environmental mapping, online communications, and a range of consultation and deliberation processes, the research moves beyond conflict resolution towards operationalising deeper understanding and appreciation of the co-use of natural resources.

"Voluntary agreements can be an effective solution, but they’re not cheap, they take time and they need maintenance," said Professor Church. "They appeal to landowners and anglers, people with existing rights, since those rights are not being permanently removed. And some paddlers accept them since they do provide new access, even if it’s not the access they thought they might achieve through legislation."

Whether you are paddling a kayak, fishing, or just enjoying a riverside walk, access to inland waters brings all sorts of benefits from improved health and wellbeing to stronger local economies. Over 15 years a team led by Professors Andrew Church and Neil Ravenscroft has played an important role in helping improve access to water-based recreation.

Universities excel at bringing together different thinking and approaches, creating new insights on intractable issues. Access to inland waterways has been a long-standing source of conflict between competing users, but academics from the University of Brighton have been instrumental in helping to change attitudes and shape new policies, bringing a fresh approach to what has been a divisive and controversial area.

"We set out to integrate academic, policy and community-based research on recreational access to water," said geographer Professor Andrew Church, "and we’ve succeeded in a range of areas. We’ve enabled a better understanding of the property rights that restrict public access, and revealed that past policy initiatives had failed because they did not take account of the cultures and values of the different activities using the water."

The impact of the University of Brighton’s work has been felt across England and Wales. The Welsh Government has implemented a regional water recreation strategy, which has shaped spending and their approach to legislation, stimulated economic activity, and increased tourism. From 2008 to 2013, new policy initiatives in Wales linked to the University of Brighton research created over 100 jobs and the economy was boosted by over £1.8m.

The Brighton team have also designed and implemented voluntary access agreements for rivers in England that have required working closely with a wide range of partners, water users and landowners. Those devised on the rivers Mersey and Waveney are seen as setting the benchmark for such agreements.

A 29km stretch of the River Mersey that has been opened up by the agreement passes through several deprived communities. A private-sector outdoor activities business, launched as a result of the new agreement, estimates that the number of new canoeists has increased four-fold between 2010 and 2013, to about 1,700 people per year, most of whom are novice water recreationalists.

The Brighton team is now extending its approach to Europe and has been funded by the European Union to work with the Canal & River Trust, and 17 local authorities in 11 countries to promote new social forms of ownership for enhancing the management of smaller waterways.
The University’s support has been valuable and lessons learnt through the project will feed into furthering European policy and input to future delivery of the European structural funds.

Chris Barnett, The Canal & River Trust
Scientists at the University of Brighton are leading industry developments to create cleaner, more efficient diesel engines, and their work on heavy-duty engines is being adopted by leading manufacturers across the world.

When fuel is burnt in a diesel engine, typically a third of the energy produced is used for propulsion, a third is lost to cooling and a third is lost through the exhaust: most truck engines are around 38 per cent efficient at best. Automotive engineers based at the University of Brighton’s Centre for Automotive Engineering are working with leading fuel injection system manufacturers to push the boundaries of high-pressure fuel injection technologies, reducing noxious emissions without a fuel economy penalty.

"Trucks have an important attribute in that their duty cycles – the way in which they’re used – have long periods of steady engine use on motorways and long distance journeys," said Professor Morgan Heikal, Ricardo Professor of Automotive Engineering. "There are big benefits attached to increasing their efficiency, especially since heavy-duty diesel engines produce between 40 and 50 per cent of all road transport emissions."

The influence of compression ratio and the interaction between fuel spray and piston bowl have been the subject of a Brighton-led project funded by the DTI with Ricardo UK, Ford and Imperial College, London. The university’s scientists developed key sub-systems for a low-emission, efficient, cost-effective and durable heavy-duty truck engine, aiming at ‘near zero’ emissions. Engineers showed that early pilot injections improved the trade-off between Particulate Matter (PM) and Nitrogen Oxides (NOx) at 25 per cent engine load, and that post-injections reduced soot emissions by a factor of at least two at 50 per cent load.

"Today’s injectors are capable of very fine control and exceptionally quick response," said Professor Heikal. "Where we once used one main injection of fuel, with a pre- and a post-injection, we now typically use at least five or six pulses of injection to shape the heat release, which is central to improved efficiency. Our latest research is focusing on waste heat recovery, aiming for more efficient total thermal management. Alongside this, we’re looking at a constant increase in the accuracy of fuel injection control using state-of-the-art technology."

Another industrial partner, Delphi, is a leading global supplier of automotive technologies with technical and manufacturing centres in 30 countries. Using developments pioneered at Brighton, engines at Delphi have shown consistent PM reductions of between 20 and 50 per cent, using injection pressures up to 3,000 bar and multiple fuel injections. "Achieving this at an affordable cost meant taking a new approach to the design and manufacture of many of the components," said David Draper, Engineering Director of Delphi Diesel Systems. "The partnership with our manufacturing specialists was central to the success of the program and has allowed us to make incremental improvements in a number of areas, providing what we believe is now the most efficient system available."
This research has recently been boosted with a £7.7m government grant towards a new engineering centre of excellence. This will enhance research opportunities and enable the search for a near-zero emissions internal combustion engine. Professor Neville Jackson, Ricardo’s Chief Technology and Innovation Officer, said: “This new initiative builds upon the highly successful collaboration, of over 20 years standing, between Ricardo and the university on next-generation clean combustion technology and high fuel efficiency engine research.”

Our commercial vehicle revenue was improved significantly due to our ability to use the results at Brighton, and Delphi now supply the FIE systems used in this research to a number of heavy duty engine makers.

Dr Simon Edwards, Global Director Technology, Ricardo UK Ltd
New treatments for regenerative medicine

Regenerative medicine restores normal functions in tissues and organs affected by serious diseases and traumas. Researchers at the University of Brighton are developing cell-based and gene-based therapy and innovative tissue engineering treatments to benefit patients through less invasive surgery and quicker healing times.

Regenerative medicine (RM) is the new frontier of medicine where various disciplines converge to develop new treatments for patients suffering from severe clinical conditions. The Brighton Centre for Regenerative Medicine (BCRM) undertakes research and development in cutting-edge therapeutics that span the fields of biology, chemistry, nanotechnology, computer modelling, genomics, biomaterials and tissue engineering.

In the past few decades, ageing and unhealthy lifestyles have been impacting on both longevity and quality of life with a concomitant rise in healthcare costs. Innovative treatments based on RM focus on early diagnosis and minimal intervention rather than invasive therapies.

BCRM offers technological approaches based on advanced materials, cell-based therapy and gene therapy to tackle challenging clinical conditions.

BCRM has been established to overcome the barriers present in this interdisciplinary sector of science. Matteo Santin, Professor of Tissue Regeneration and leader of the Centre said: “We work hard not only on our science and technology, but on our communication among colleagues, with our patients, public and industry while training a new generation of scientists.”

"Working with clinicians is central to our approach," said Professor Santin. "Our practitioners at the Leaf Hospital, Eastbourne treat 6,000 patients a year who are affected by foot and leg ulcers, helping us to understand pathways of healing, to improve the therapeutic efficacy and ease of handling of wound dressings through the development of biomimetic and bioactive biomaterials.”

Periodontal surgeons are helping researchers at the Centre to develop bone fillers and membranes for the regeneration of soft and bony tissues. Plastic surgeons at the Queen Victoria Hospital, East Grinstead are providing us with feedback about the optimisation of cell-based therapy and tissue engineering for the
We have worked closely with the University of Brighton to develop the next generation of our product, MaioRegen™, a composite collagen-bioceramic 3D scaffold for the early treatment of osteoarthritic joints. Scientists at Brighton developed novel biomimetic nano-size material to modify the surface of our porous scaffold that accelerates both cartilage and bone regeneration. The key to success was Brighton’s ability to suit industrial needs and facilitate production at a manufacturing scale. Exchange of personnel with Brighton was fundamental to our company gaining technical know-how and allowing us to fulfil regulatory requirements.

Dr Claudio De Luca, Vice President, Product Development, Mkt&Sales, Finceramica SpA, Italy
A unique partnership with the medical device industry has helped University of Brighton researchers improve patients’ lives through the development of a suite of novel biomedical products.

As research councils focus on getting PhD students to move into industry, a University of Brighton partnership with a local company has helped lead to the creation of innovative new medical devices and given research students a greater understanding of how to turn novel ideas into commercially viable products.

The partnership between Biocompatibles UK Ltd and the University of Brighton’s School of Pharmacy and Biomolecular Sciences began in the early 1990s. It evolved out of the Medical Implants LINK Programme, a government and research councils-funded initiative to support the development of novel phosphorylcholine polymer materials as commercially viable ophthalmic products.

The first product the partnership worked on was a family of contact lens materials. Since then a range of other products have been developed, including enhanced medical device coatings for stents and catheters, and novel drug-eluting bead [DEB] systems for the treatment of liver cancer. The products have delivered improved clinical performance, demonstrating the advantages of new materials over conventional technologies.

The partnership has also supported the development and marketing of the Proclear® family of soft contact lenses by the EyeCare Division of Biocompatibles UK Ltd, which was the sixth largest contact lens business in the world when it was sold in 2002 for around £70m. Proclear® sales are now worth an estimated $300m per annum.

University of Brighton research has also contributed to the broader regulatory approval of PC-coated medical devices for clinical use, and assisted in the development of the BiodivYsio® family of coronary stents and the Yellowstar® family of urological catheters and stents.

Other products that have been developed with the aid of University of Brighton research include Celluminate®, a fluorescent cell-tracker system, and DC Bead® Technology, a novel combination product for the treatment of liver cancer initially intended as a device for embolising the blood vessels of tumours such as uterine fibroids and arteriovenous malformations.

**OVER 100,000 REPORTED PROCEDURES USING DEB TECHNOLOGY IN 600 HOSPITALS ACROSS 50 DIFFERENT COUNTRIES**

**PROCLEAR® CONTACT LENSES SALES ARE NOW ESTIMATED $300 MILLION PER ANNUM**

Photograph: Biocompatibles UK Ltd, a BTG International group company.
The partnership works by embedding graduate students in Biocompatibles UK through both RCUK-funded studentships and a Knowledge Transfer Partnership. Originally, students were based mainly at the University, but over the last 10 years it has become more common for the students to be based at the company.

Professor Andrew Lloyd, who has served as both Scientific Adviser and Consultant to Biocompatibles UK, said the partnership has been mutually beneficial. The university has been awarded studentships and grant funding from different research councils as a result of its close partnership with industry, and students have been able to see their research have a direct impact. In return, the company has had both the academic expertise and research base to draw on to enable it to take its technology forward and move into new areas.

Professor Lloyd said: “Often the outcomes of research in this field offer only incremental advances and therefore are not commercially viable. However, in this case, working so closely within and alongside a successful business stimulates innovation by making you consider how your research can be applied to solve practical challenges.”

In early 2011 BTG plc successfully acquired Biocompatibles UK Ltd for £177m. This has bolstered the commitment to continue to develop the DEB technology and collaboration with the University of Brighton will be central to the research that continues to underpin this business.

Professor Andrew Lewis, Director of R&D at Biocompatibles UK Ltd
SAFER DRINKING WATER
From life-saving low-cost wastewater treatment in the aftermath of the 2010 Haiti earthquake, to big improvements in drinking water quality in developing African countries, The University of Brighton’s Environment and Public Health Research Group is making a major contribution to protecting health and improving the environment.

The 2010 earthquake in Haiti killed tens of thousands of people, but the subsequent threat from disease had the potential to be far more deadly. International agency Médecins Sans Frontières (MSF) was quickly on the scene, setting up a hospital to treat cholera patients, but without proper treatment of its wastewater a public health disaster loomed.

“Cholera is a waterborne disease that can kill within 48 hours, and it can be rife in post-disaster conditions,” said Professor Huw Taylor, a leading authority on low-cost water treatment and sanitation. “The sewage created in cholera treatment centres needs to be dealt with very carefully. We created the first low-cost, on-site emergency disinfection process for cholera treatment centre wastewaters. It was great to see the University of Brighton’s research playing such a vital role.”

Professor Taylor has been pioneering low-cost water treatment and sanitation for more than 20 years. Chemical coagulants such as slaked lime, widely used in the building industry, are added to the water, helping microscopic particles to clump together and produce bigger lumps, which fall to the bottom of the treatment plant. A high pH of 11 also kills off the pathogens that cause disease.

“I’m proud that we’re making a difference in low-income countries,” said Professor Taylor. “Haiti showed that our approach can work effectively in helping to manage recovery from disasters, and it raised our profile with the international community particularly through the work of some of our PhD students, including Emanuele Sozzi.”

The University of Brighton’s recent work in Africa, commissioned by UNICEF, demonstrated that well-designed sanitary surveys can play a pivotal role in providing low-income countries with safe drinking water supplies. In Malawi, 1,000 children under five years die from water-related illnesses every month. Improved drinking water and sanitation can reduce the figure by 90 per cent.

“We tested 402 wells and sanitation facilities during the dry season and a further 479 during the wet season and found that the water pumps often weren’t performing well enough in terms of water quality, especially during the wet season,” said Dr James Ebdon, also from the Environment and Public Health Research Group. The research led international water and sanitation charity Pump Aid to improve the design and siting of 300 new shallow wells in Malawi during 2013, with a further 1,500 to be commissioned by the end of 2015, serving a population of 180,000 people. The research in Malawi also led the organisation WaterAid to review its approach to water-quality testing in the country using the model developed by Brighton.

At the heart of much of the group’s research are bacteriophage-based source tracking tools. A single bacterium only found in the anaerobic conditions of the human gut is isolated and cultured in the lab. When a water sample is introduced, gaps in the culture indicate where a waterborne virus has attacked the human bacterium, demonstrating that human faecal matter is the source of contamination. “Alternatives to our method are significantly more expensive,” said Professor Taylor. “Molecular tracking using DNA analysis can cost around $10 per sample, whereas our method costs around $1, so there are obvious benefits for poorer countries where the problems are often most acute.”

The work provided critical evidence for us about the siting, build quality and maintenance of the pump. The research led not only to improved standards, but more rigorous quality management and the employment of additional staff who are responsible for raising community awareness of the issues and training to ensure that the potential impact of clean water is optimised.

Duncan Marsh, Director of Programmes, Pump Aid

New Improved Shallow Wells in Malawi in 2013, With a Further 1,500 to Be Installed by the End of 2015, Serving a Population of 180,000 People

300

1,000

Children under five years die in Malawi from water-related illnesses every month. Improved drinking water and sanitation can reduce the figure by 90 per cent.
Every time we use a mobile phone, our location is recorded. Originally, this was necessary to enable the cellular communications system to work properly. Today, however, our location is a valuable piece of commercial data, used to direct us to the nearest coffee shop or to tell us which motorway exit to take.

Ensuring individuals’ privacy is protected is a business-critical task and telecoms giant Nokia recognised that research being undertaken by the University of Brighton’s Visual Modelling Group, led by Professor John Howse, could give them a competitive advantage. Today, diagrammatic logics, automated diagram drawing and theorem proving are producing effective and accessible privacy protection models for the company.

“We worked with Nokia first on ontology design,” said Dr Gem Stapleton from the Visual Modelling Group. “We developed ways to share data infrastructure across different software and hardware platforms. Concept diagrams have helped Nokia design ontologies – frameworks for organising information – and this will be a big growth area in the future as ontology engineering demands increase.”

Concept diagrams can take many forms, but at heart they are a way of communicating more simply and more visually. Nokia’s challenge is to bridge different language and technical backgrounds to make sure that everyone involved in collecting and using personal data is aware of the rules that affect them, their colleagues and their customers.

Privacy engineering in the telecommunications sector is a complex task. Not only are millions of new pieces of data created every second, as a global business Nokia deals with scores of different legal jurisdictions with staff fluent in all of the world’s major languages. As a high-tech company, it also employs professionals in many fields, all of whom speak their own technical language.

“‘We’ve found that most people – including those who are technically trained as well as those who are not – relate to this approach intuitively,’’ said Dr Stapleton, “and concept diagrams are a good way of achieving consistency of message whatever the audience’s prior knowledge. Our concept diagrams are now widely used in Nokia’s privacy engineering, to define internal taxonomies and ontologies and their relationships, which is a key part of their data analysis. Concept diagrams can be communicated to a wide range of stakeholders quickly and consistently.”

As well as giving a big boost to privacy engineering, clearer communications are making a direct impact on Nokia’s corporate performance, as the company’s Privacy Officer and Architect Dr Ian Oliver has explained: "The University of Brighton’s development of Concept Diagrams provided Nokia with an effective tool for expressing and communicating aspects of these complex systems in intuitive ways; this significantly reduces development time, reduces ambiguities and ultimately allows us to more effectively alleviate security and privacy threats to both the company and its consumers.”
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Dr Ian Oliver, Privacy Officer and Architect, Nokia
Safeguarding lives in fighting vehicles

Twenty-five years ago, NATO armies had a huge variety of vehicles from different manufacturers in their inventories. Today’s high-tech fighting vehicles have adopted a standardised approach to technology, making them safer and more effective, and academics at the University of Brighton are at the heart of leading this integrated and standardised approach.

Today’s vehicles are more complex and more dependent on electronics than ever before. From family hatchbacks to armoured personnel carriers, vehicles rely on a whole host of systems working together effectively to get us from A to B.

Military vehicles have one big difference, however. A car maker manufactures or buys all the various components it needs to create a vehicle, but for military vehicles different sub-systems are built by a range of manufacturers and brought together by a prime contractor to develop and maintain through the lifecycle over three decades. Today, each sub-system includes sophisticated electronics, and ensuring these are properly integrated and standardised is a critical task.

“People who design new military vehicles and their systems often reinvent the wheel,” said Professor Elias Stipidis who leads the University of Brighton’s Vetronics Research Centre (VRC), the UK’s only academic centre of excellence in military vehicle electronics. “Making things less complex means that projects can come together more quickly and effectively, in particular, when new threats dictate for Urgent Operational Requirements. For example, Defence Aids Suites (DAS) help soldiers see and understand threats in time to avoid or address them, and today’s systems can make an auto-response even before the user has made an input. Being able to adapt a DAS system to a vehicle and address new threats fast can have enormous lifesaving impact with less financial burden.”

Standardisation is a fundamental approach of the centre’s role, working closely with the Ministry of Defence (MoD), NATO-related organisations and other allied nations including Germany, Sweden and France. Standardisation is important at the sharp end, helping to maximise combat effectiveness, but it is also centrally important in procurement, both from the buyer’s and the seller’s perspectives. “If a contractor is developing a bespoke product for the MoD it ends up being very expensive,” said Professor Stipidis, “but standardisation means that, with some small modifications, the product can be sold to our allies. Open standards mean bigger markets, better capabilities, and cost savings for manufacturers and customers.”

A recent example of a standardised vehicle is the Foxhound, a replacement for the Land Rover Snatch, to transport troops in potentially hostile environments, used most recently in Afghanistan. “There are electronics in the base vehicle that need to be properly integrated with the military electronics and all of this is part of creating situational awareness,” said Professor Stipidis. “Today’s soldiers are able to deploy from their transport with a much fuller picture of their environment and of the threats they are facing. Standardisation has helped to build an effective fighting vehicle that meets the needs of the user, and which has been procured and built as efficiently as possible.”

Bringing together academic thinking and practical relationships with government departments and manufacturers can be a complex task. Professor Stipidis is currently leading the academic input within a group of 14 countries working towards a NATO Generic Vehicle Architecture that will create a coherent approach for military vehicle electronics procurement.

“As academics we can help people understand and talk to each other,” said Professor Stipidis. “For example, a General may decide what she or he needs in terms of future technology, but she or he may not have a full awareness of technological capabilities and, more importantly, constraints. We create coherent conversations and we have an independent voice, aside from the end-user and manufacturer. This consistency of approach helps to build better understanding and systems that ultimately help to protect and save lives.”
Photograph: The ‘Buggy’ a mobile demonstrator platform for vehicle electronics.
The intersection between information technology, society and security is becoming exponentially complex. Researchers at the University of Brighton are working on new approaches to create secure ways for people to make use of the huge potential that today's connected and interactive world offers.

The world of information technology has changed considerably over the past 30 years. A generation ago, computers were mostly stand-alone devices, with minimum connectivity, used by professionals, specialists and enthusiasts to perform specialised tasks.

Today, computers, smartphones and even household appliances are widely connected and used to store, exchange and gain instant access to information and data wherever it is stored.

They also perform tasks related to everyday life such as banking transactions, health support and military operations.

As a result, one of the biggest security challenges is the ever-increasing levels of human interaction with technology. "Information technology is so embedded into our lives that security requires an effort that combines people, technology and processes in an integrated fashion. As recent research has shown, purely technical approaches do not always produce the expected results," said Haris Mouratidis, Professor of Software Systems Engineering.

“We need to understand the context in which information technology systems operate and the human aspects that might influence security. Usernames and passwords are a technical solution that is widely used, but if users do not take care of their login information the technical approach, no matter how strong, will be defeated.”
Recognising the need to consider security not just as a technical issue but as a socio-technical issue, which requires understanding from multiple viewpoints, the University of Brighton has invested in a new research cluster to develop novel techniques to secure computer systems.

The Secure and Dependable Software Systems (SenSe) research cluster brings together expertise from the university’s School of Computing, Engineering and Mathematics, and related areas, including software engineering, artificial intelligence, visual modelling and security engineering. The cluster is developing novel ways to create dependable software systems with particular emphasis on security, trust and risk.

An important focus of SenSe researchers is on the development of new ‘security-focused’ methodologies, where security is considered from the start of the system development (or redeployment/migration) process alongside other technical requirements and a clear understanding of the social context of the system. Such a holistic approach enables earlier identification of potential security vulnerabilities and an understanding as to why these vulnerabilities exist in the first place. Research has shown that early identification and fixing of security-related problems results in financial and operational benefits. Researchers from SenSe have developed automated software tools, which support organisations (and individuals) to understand and analyse their security requirements, risks and vulnerabilities, and to identify appropriate solutions to support the security of their systems.

Another important focus of SenSe is the security implications introduced by new technological paradigms such as Cloud Computing, Big Data, and Internet of Things. “The introduction and wide usage of different technological paradigms presents new security challenges, not necessarily on the security needs and expectations that information technology users have, but rather on identifying appropriate security solutions to fulfill those needs and expectations,” said Professor Mouratidis. Within this context, researchers from SenSe have developed techniques that enable organisations to analyse the influence different technological paradigms have on the security of their systems.

A third area of focus is on security-related issues such as privacy and trust. “Security and privacy are distinct but closely related issues, which can create conflicting requirements,” said Professor Mouratidis. SenSe researchers have developed techniques and tools that support a clear understanding of privacy and trust issues, and which support the identification of areas that can jeopardise the security of a software system due to conflicting security and privacy requirements or wrong trust assumptions.

“Today’s economy and society are vitally dependent on software systems operating with a certain degree of security. Our group works to deliver innovation, knowledge and new practices for the development of secure and dependable software systems. Ultimately, we strive to improve human trust on software systems,” said Professor Mouratidis.
Evolving minds and hominin behaviour

The question of language development and origin is vital to our understanding of what it means to be human. The story of human evolution over the last seven million years is incredibly complex but one in-road is to access the thoughts and behaviours of our direct evolutionary ancestors (hominins). Current work on the assessment of a Stone Age site, Isimila, in Tanzania could enable the accurate dating of the site as well as provide answers to how these ancestors lived.

In order to try and engage with the behaviours of our ancestors, archaeologists are often left with a limited material culture resource (primarily stone tools) made by multiple species of hominin over a period of 2.6 million years. Dr James Cole, Lecturer in the School of Environment and Technology, has carried out research that focuses on when past hominins had the cognitive ability to use material culture for managing their social interactions and sending messages about themselves to others – something we do on a daily basis through the clothes and jewellery we wear, or the use of our phones.

Identifying the point in the past when objects became more than just functional tools to butcher a carcass, but became objects of the imagination in terms of social signalling, has direct implications for understanding the development and origins of language and how our modern human brains work the way they do.

A new collaborative project in Tanzania, led by Dr Cole, is developing this research further at a site called Isimila. Isimila is an Early Stone Age site with an outstanding artefact record including some exceptional preserved objects known as giant handaxes. Giant handaxes have often been linked to the first use of artefacts as symbols.

The research at Isimila focuses on dating the site using a technique known as optically stimulated luminescence to ascertain the age of buried artefacts. With this age control, it will be possible to understand the chronological and micro-environmental parameters that characterised the landscape of Isimila over 260,000 years ago, and which subsequently influenced the scope of hominin occupation. Ultimately, the project aims to determine which species of hominin made these artefacts and the origin of complex social behaviours at a broader East African scale, in a species that may predate our own Homo sapiens population.

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Working with Dr Cole will lead to a better understanding of the accumulation, distribution, and utilisation of stone tools and other archaeological materials at Isimila.

Dr Pastory Bushozi, University of Dar es Salaam, Tanzania
Musculoskeletal conditions such as lower back pain and osteoarthritis are the most common cause of chronic disability, placing a significant burden on the NHS and estimated to cost society nearly £15bn a year. Brighton’s Musculoskeletal Research Centre is playing a key role in building a better understanding of these debilitating conditions, focusing a full range of scientific expertise on fundamentally important research.

According to Arthritis Research UK, one in five of us will consult our GP about a musculoskeletal problem this year. This range of conditions affects more lives and creates more disability than any other disease, but our understanding of how we develop these conditions and how they progress is far from complete.

A new collaborative venture – the Brighton Musculoskeletal Research Centre (BMRC) – encompasses the University of Brighton, Brighton and Sussex Medical School, and the Royal Sussex County Hospital, investigating a wide range of disorders from degenerative conditions such as osteoarthritis and tendinopathies to autoimmune diseases like rheumatoid arthritis and lupus. Through considering possible ways to provide earlier diagnoses and improved treatment options, the BMRC aims to limit pain and loss of function whilst improving quality of life and meeting the needs of an ageing population.

Early diagnosis and the ability to predict outcomes of therapies are important elements in treating many musculoskeletal disorders, which affect bones, muscles and tendons. “Many osteoarthritic patients who present with a hip or knee problem often do so far too late,” said Dr Sandra Sacre, who leads the BMRC. “Early diagnosis is often difficult and many drugs currently in use are either extremely expensive, which means they’re not widely available, or they are only moderately effective at controlling disease progression. More effective treatments are a high priority and we’re using state-of-the-art techniques to build a better understanding of how tissue damage and inflammation begins and progresses, with some groups focusing on measuring the effect of treatments on patients.”

Bringing together expertise in the areas of cell biology, molecular biology, tendon and muscle imaging, bone, physiotherapy and drug discovery is helping the BMRC’s systematic evaluation of disease processes at molecular, cellular, tissue and systemic levels. The interdisciplinary research is not merely conceptual at BMRC, but a very practical approach.

“There is a wide variety of work going on in Brighton and at our other sites across Sussex,” said Dr Sacre. “I recently led a research seminar where all our different groups were able to interact and present their latest research to each other, sharing expertise and sparking some really interesting discussions which have had some practical outcomes. For example, our colleagues at Eastbourne are looking at tendon pathology and needed some better techniques for measuring inflammation. Our labs at Falmer were able to help as these were techniques we were using every day.”

“Much of the research at the BMRC is at the basic level, asking questions about why people get these diseases and understanding the disease processes,” said Dr Sacre. “Within the BMRC we’re asking fundamentally important research questions, which have the potential to lead to effective diagnoses, treatments and cures in the future.”
Evidence-based practice is a way of bridging the gap between research and practice. Evidence-based practice models originally emerged in the 1980s and 1990s. Today, many of the Allied Health Professions are working on developing their own evidence bases, and University of Brighton academics, in collaboration with the National Council for Osteopathic Research, are leading a global effort by the physiotherapy and osteopathy professions to align research priorities and make rapid progress on identifying and implementing best practice.

The University of Brighton has been at the heart of a new approach to gathering clinical and practice data, using it to inform policy and planning for some leading organisations including the General Osteopathic Council, the Chartered Society of Physiotherapy (CSP) and Physio First, the private practitioner organisation in the UK. This is changing the way that physiotherapists and osteopaths manage their professional practice. Innovative methods of collecting data are being used as part of a global initiative to inform and revise professional standards and to identify priorities for new research areas.

“There is a clear recognition that we need a much stronger and broader evidence base, and the best way to achieve that is to achieve consensus on research priorities,” said Professor Ann Moore from the School of Health Sciences. “In general practice, patients present with a problem, they’re examined and diagnosed, and then, most commonly, a drug is prescribed. As musculoskeletal physiotherapists we tend to use hands-on treatments and also patient tailored exercise, give advice and promote self-management. Therefore, because of multi modal approaches, our evidence base is quite complex in its development and is used very differently.”

Research priority development activity has been carried out using a questionnaire-based Delphi technique involving experts from 22 organisations around the world who are members of the International Federation of Orthopaedic Manipulative Physical Therapists. Using an iterative approach, the group set out to identify a set of research priorities for musculoskeletal physiotherapists around the world and followed on with a second research project to develop priorities for the UK physiotherapy profession, this time involving experts across the 46 speciality areas within physiotherapy.

This approach is already making a difference: for example, in South Africa three universities are using the research priority lists with 55 masters students and one PhD student who are writing dissertations focused on the research priority areas. The data on physiotherapists has helped identify 127 research priorities for the physiotherapy profession. This led to changes in the focus of research funding applied by the CSP’s charitable trust and has also informed how the CSP is working collaboratively with external research charities and patient organisations, such as the Stroke Association and Arthritis Research UK.

In physiotherapy and manipulative therapies, the approach is multi-modal, combining examination, assessment and diagnosis with advice on exercise, posture and patient self-management to reduce the risks of a recurrence of the condition. “This patient education is a key part of what we do, so part of our evidence base focuses on the intellectual interplay with a patient during the treatment session,” said Professor Moore.

“We are continually assessing the patient’s capacity for and inclination towards self-management, and this understanding is critical to providing the right treatment. Some patients are highly motivated towards self-management, whereas others want to be provided with a ‘cure.’ Like me, most researchers are established academics, but we also recognised that our graduate students could contribute very effectively to the research programme while they were working on their dissertations,” said Professor Moore. Therefore, a set of uniform research priorities are of high importance and relevance.
This is the first extensive collection of data using a Standardised Data Collection tool from physiotherapists in private practice in the United Kingdom and indeed globally and sets out a model of good practice for private practitioners internationally.

Physio First report on the Data Collection Project
How the universe works?

Nuclear physics is the world of protons, neutrons, quarks and gluons, strong interactions and mass numbers, and it is a field that has an impact on our everyday lives. Scientists at the University of Brighton are at the heart of international collaborations focusing on a fundamental understanding of how the atomic building blocks of the universe were created and how they behave.

Nuclear physics may be a complex and mysterious world, but the fruits of the basic science are all around us. Nuclear power generates a sixth of the UK's electricity, MRI scanners are an everyday part of medical diagnosis, and TV archaeology would be frustratingly incomplete without radiocarbon dating.

"We're doing blue-skies academic research at the University of Brighton," said Professor Alison Bruce, leader of the university's Nuclear Physics Research Group. "We're working on important building blocks of knowledge that are helping to inform the general picture of nuclear physics."

Today, nuclear physics in the UK is centred on worldwide collaborations. The University of Brighton's nuclear physics scientists work closely with the University of Surrey, making joint use of facilities in Japan. Each university leads on certain areas, applying for 'beam-time' – use of facilities at other institutions – and then controlling experiments and results.

Radioactive Ion Beams (RIBs) are a new direction for nuclear physics, with RIBs under construction in Germany, Japan and the US. Nuclear scientists from the UK will be working with German colleagues on a facility currently being built at Darmstadt and staff from the University of Brighton are working on the detector systems for the new centre.

"We can now study in the laboratory a range of nuclear reactions that take place in exploding stars," said Professor Bruce. "We'll be able to understand how the chemical elements that we find on Earth were formed and distributed through the universe. RIBs use intense beams of chemical elements and 'in-flight' separation can provide any isotope, independently of the chemical properties of the element. The production process is fast, and that results in beams of the shortest-lived, most exotic nuclei which are the key academic focus when it comes to testing the models we have for how protons and neutrons behave in the nucleus."

The by-product is that the exotic nuclei researchers are studying are also produced in nuclear fission reactors that produce power, so, for example, an understanding of how heat is produced by the fission fragments has direct applications in areas such as how long a nuclear power reactor needs to be left to cool down before maintenance can be carried out. "Although we're an academic research group looking at big science, we also provide an excellent training environment for our research students and staff," said Professor Bruce, "many of whom go on to work in the nuclear power industry, helping to fill the current skills gap."

The ultimate goal of nuclear physics is to create a model that works for all nuclei in all states. A single unified description will mean that scientists have a fundamental understanding of all the forces that act on subatomic particles and will take them a big step closer to understanding the universe and the world around us.

"Our principal motivation is the basic science, and we contribute strongly to the world sum of knowledge and understanding," said Professor Bruce. "But blue-skies research in nuclear physics has the potential to tackle growing energy demands and create radical new medical therapies. We want to understand the universe, but we can contribute to a better world as we get there."
Photograph: Three germanium detectors measuring the gamma-rays emitted by zirconium nuclei as they decay.
COLLEGE OF SOCIAL SCIENCES
Brighton is home to thriving communities of lesbian, gay, bisexual and transgender (LGBT) people. Research from the University of Brighton is helping to support their needs, change policy and professional practice, and provide protection for vulnerable people where wider society’s attitudes are adversely affecting their lives.
This work is being taken forward internationally by Dr Kath Browne, who is leading a new project funded by the ESRC as one of its 2014 transformative research projects into what makes a life that is liveable including examining the impacts of equalities legislation in the UK and India.

In Brighton a project called Count Me In Too (CMIT), with lead researcher Dr Browne, worked with the University’s Community University Partnership Programme and has been central to the development of local policies on alcohol, community safety and domestic violence, as well as contributing directly to LGBT-specific housing issues being a focus of the city’s housing strategy.

Since 2003, academics at the University of Brighton have undertaken participatory action research to identify the specific health and wellbeing needs of LGBT people in areas such as mental health, suicide prevention, safety, housing, domestic violence, drugs and alcohol. The research has changed local and national policy and reshaped services to reflect the diverse needs and experiences of LGBT communities.

Participatory action research involves people in the design, implementation and the dissemination of research, not simply as ‘subjects’. This research has produced new knowledge about the mental health, health, housing and community safety needs of LGBT communities, demonstrating a need for a broader social policy and wellbeing framework that includes but also moves beyond constrained views of abuse and hate crime.

In the UK, the research has influenced policy resulting in the first local LGBT housing strategy and the first suicide strategy in Brighton and Hove that focuses centrally on the needs of LGBT people. Recommendations from the research have also been adopted by the Department of Health, the UK Drug Policy Commission, the Cabinet Office and the Equalities and Human Rights Commission, and other parts of the world are following suit, with national and state policy in Australia using the university’s research to improve services for LGBT people.
The project has identified a range of good practice in the use of social media, but has also highlighted shortcomings in the context of outreach communications. Reaching the hard to reach requires strategies that go beyond creating a social media presence. Early findings indicate that the most marginalised group – transgender and gender queer young people – actively seek out alternative social media platforms with a more open ended structure than for example Facebook. Research is demonstrating that LGBT young people do not rate anonymity as a benefit of using online communication, welcoming the fact that staff and volunteers with whom they are interacting are visible as ‘out’ lesbian, gay, bi or transgender people and that young people can communicate openly and safely is a significant benefit.

The key finding was the importance of creating a safe environment via LGBT-specific services where LGBT people can talk about their mental health, and developing community networks for facilitating connections and overcoming a sense of isolation.

Research continues and the university’s new Transforming Sexuality & Gender research cluster will focus on innovative and creative methods to generate impact and change. “Not everyone wants to sit responding to questions about their lives,” says Dr Johnson. “For young people especially, talking about themselves is not something they’re used to doing. Using creativity, whether it’s photography, art, sculpture or even building with Lego, is a safe and engaging way to begin the process of discussion.”

Another new area of research is focusing on the part that social media plays in the way that a youth service provider reaches and engages isolated, marginalised, vulnerable and at risk LGBT youth in their everyday campaign work and service provision. Led by Dr Olu Jenzen and Irmi Karl from the College of Arts and Humanities, and in collaboration with Allsorts.

"CMIT was of fundamental use in helping us to develop the city’s LGBT People’s Housing Strategy. The research provided a vivid insight into the lives and experiences of the city’s LGBT communities that we would not have got from our traditional engagement routes. Whilst CMIT was some time ago, the relationships and understanding developed during this project have remained and LGBT-specific housing needs and action remain a key focus of our new housing strategy."

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Research at the University of Brighton is using short films to enable policymakers to engage with research findings on the everyday experiences of mobility and transport.

Dr Lesley Murray joined the University of Brighton after working for Transport for London. Her research has focused on the sensory and embodied dimensions of mobilities, as these are often neglected in transport planning. "My research findings challenge policymakers to think beyond behavioural change," Dr Murray said. Short films based on her research ask policymakers to question current assumptions on people’s mobility and their ability to adopt low carbon travel.

One film, Through Our Eyes, which focuses on children’s mobilities, attracted attention from local authority travel planners, bus companies and Transport for London. Using their own footage, it presents children’s accounts of their journey to school. Eleanor Togut, a project co-ordinator for Living Streets in West Sussex argued: “The film that Dr Murray created as part of this research was particularly influential and I devised projects to challenge some of the views of risk-averse mothers with some very positive outcomes.” Following a presentation of her film work at the Global Challenges in Transport Leadership Programme at the University of Oxford, Dr Jennie Middleton, the Course Director, said that Dr Murray had “engaged a range of transport policymakers, practitioners and academics to her fascinating and empirically rich research on children’s independent mobility.”

Dr Murray is now turning her attention to researching how the interactions between generations impact on travel in cities, as well as taking part in a worldwide network of academics and community collaborators funded with £1.6m from the Canadian Social Sciences and Humanities Research Council to study ageing in relation to mobile technologies.

Photograph: Shoes hanging from the wires signify that mobilities are not just about travelling between places but involve the interconnected movements of people, objects and communications.
Developing children’s resilience

University of Brighton research is helping children, young people and their families who are facing challenges or adversity to build resilience and to create better outcomes in all aspects of their lives.

Why do some children and young people facing similar difficulties do better than others? And what can we do to help those who struggle? These questions led Professor Angie Hart to consider what resilience means and how it affects each of us. “Our primary interest is in helping children and young people who are facing challenges or adversity because of mental health issues, deprivation, social inequalities or a range of other causes,” said Professor Hart. “Our goal is to help them build resilience to these challenges and to create better outcomes in all aspects of their lives.”

Resilience research has a long history, but by the mid-1990s there had been no systematic, yet easy to apply, synthesis of this work in relation to disadvantaged children and families. Professor Hart and collaborators reviewed more than 1,000 publications on resilience, challenging the view that resilience resides solely in individuals, rather than arising from person-environment interactions. Insights from this work and the activities of an inclusive partnership that involved 30 practitioners, 50 parents and 40 young people were used to develop a new approach to resilience building, known as Resilient Therapy, which has improved attainment, led to better life chances and improved mental health amongst young people.

In Malaysia an orphanage supporting 150 children have adopted Resilient Therapy in partnership with their local university. An approach for schools called Academic Resilience has been devised by Lisa Williams and Professor Hart, and adopted by YoungMinds. Partnership work to develop the approach is ongoing.

“From editorial groups that included parents and practitioners we created a resilience framework, which provides easy to understand ways of making ‘resilient moves’ in people’s lives. The demand for this actually comes from the parents, practitioners and young people as they had questions they wanted to be addressed. We’ve used some simple but effective techniques. For example, schools involved with trialling our approaches have used careers information screensavers for school computers, putting strong life choices in front of young people in an almost subliminal way,” said Professor Hart.

A community interest company and website called boingboing have been founded to promote the Brighton resilience work by Professor Hart and Kim Aumann, the former director of Amaze, a charity for parents of children with special needs. Those involved in the resilience work see themselves as part of the boingboing community. The popular website supports and disseminates resilience-based approaches in the UK and internationally using an inclusive approach, involving academics, parents, young people, practitioners and service users.

In the UK boingboing has helped deliver workforce training in resilience approaches to 10 local authorities, including Brighton, West Sussex, the London Borough of Newham and Hampshire. Resilience-based practice is now a central aspect of their work with young people and families. In Sweden, 500 professionals have been trained in Brighton’s resilience approaches and a resilience-based approach has been adopted in over 30 schools and preschools and as part of healthcare services for the 10,000 children and young people living in the local area. The Brighton approach to resilience has also been used to guide the delivery of children and family services in Greece and Germany.

Brighton’s resilience approach has impacted public policy, and the Chief Medical Officer for the UK included details of Resilient Therapy in the 2012 annual report. The Big Lottery Fund invited Professor Hart to join a panel of five decision makers allocating a £75 million fund to boost resilience in schools and local service systems. As Lyn Cole, Deputy Director, England for the Big Lottery Fund described: “We’ve drawn on Angie Hart’s extensive research in emotional resilience theory and practice, combined with her own experience of working in child and adolescent mental health services. Angie is one of the major driving forces behind Headstart. She is a key member of our expert panel and sat as a member of our HeadStart Committee, which recently saw grants awarded to HeadStart projects across England to run test and learn projects over the next 18 months.”
Discussion from the University of Brighton workshop formed the basis of Mind’s national briefing to the network of 150 local Minds as to our overall approach to resilience.

Dave Lowson, Local Services Strategy Manager, Mind, the UK mental health charity.

10 UK LOCAL AUTHORITIES HAVE RECEIVED WORKFORCE TRAINING

500 PROFESSIONALS HAVE BEEN TRAINED IN RESILIENCE APPROACHES IN SWEDEN ALONE

OVER 60 EU SCHOOLS AND PRE-SCHOOLS HAVE ADOPTED THE APPROACH
Gun crime is a serious and high priority crime in the UK, but media coverage on the consequences of firearm violence often obscures the highly successful story that recorded gun crime in England and Wales has fallen by nearly 50 per cent during the past decade. One University of Brighton academic has been at the heart of the gun control and crime debates for 20 years, directly influencing new legislation, policy guidance and policing innovations to tackle gun-related violence.

Professor Peter Squires, a criminologist at the University of Brighton’s School of Applied Social Science, has played a central role in advising the Home Office, the European Union and many law enforcement agencies, as well as helping to shape public debate over gun crime and violence.

Professor Squires noted that “because gun crime was relatively uncommon until the 1990s, our understanding of how criminal supply and demand operated and how illegal gun markets interacted with various legal and ‘grey’ supply chains was little understood.” Intelligence-led policing has since moved on in leaps and bounds; we now know the sizeable contribution made by air weapons and replica firearms to the rapid growth in recorded gun crime in the late 1990s, and we have a much better understanding of the markets in converted, reactivated and even ‘antique’ firearms – what Professor Squires has called the “junk gun” markets. The introduction of the National Ballistics Intelligence Service (NABIS) has greatly enhanced the police ability to forensically examine firearms and ballistic materials from crime scenes, and to trace active criminal firearms.

Professor Squires’ research made big impacts in the wake of the 2010 Cumbria shootings, when the Home Affairs Select Committee undertook an inquiry into firearms control. His evidence submitted to the committee on the role of legal weapons in domestic violence and the role of ‘readily convertible’ weapons (such as replicas and starting pistols) in firearms supply was considered particularly important.

Subsequently, a new UK government Anti-social Behaviour, Crime and Policing Bill included recommendations based on this evidence for a new offence of ‘illegal firearm possession with intent to supply’. This Bill was passed and came into effect during 2014. Professor Squires’ evidence on the use of firearms in domestic violence was also part of the evidence base for new Home Office proposals on the need to consider domestic violence risk when granting gun licenses that were included in the Guide on Firearms Licensing Law 2013 distributed to all police forces to guide their determination of firearm licence applications and renewals.

The issue of how guns ‘trickle’ from legal ownership into a world of illegal ownership and use is a big concern. “All guns start out as legal, but there are points of slippage where guns move into the illegal side,” said Professor Squires. “Guns in the home are most at risk, with at least 1,000 being stolen each year, and they’re open to mis-use in the context of domestic violence.”
Further research at the University of Brighton on the complex area of domestic violence is being undertaken by Dr Paula Wilcox who has received a €750,000 European Union grant to examine child to parent violence in Bulgaria, Ireland, Spain, Sweden and the UK.

Following appointment in 2013 to the UK Association of Chief Police Officers (ACPO) National Independent Advisory Group on Criminal Use of Firearms, Professor Squires continues to contribute to policy and practice debates in these areas, he said: “If we want influence in areas of social problems like this, we need to take the opportunities to communicate when they come along.”

Photograph: Part of a cache of 70 firearms (rifles, handguns and sub-machine guns) recovered by Sussex Police from a private house in Brighton in 2014. Many were in full working order with ammunition. © Sussex Police.

Squires is the country’s most-quoted academic expert on gun crime, whose voice has been much in demand over recent months, not least by the BBC.

*The Guardian*
The current research, funded by the British Academy and National Institute for Health Research, uses secondary analysis of the existing records to establish statistical patterns of s136 detention in relation to age, gender, location and other demographics, as well as in-depth interviews and observations with health professionals, police and people who have been detained. Professor Bendelow found that, “Brighton and Hove, Eastbourne, Hastings and Crawley all have significant demands on their mental health services, and, despite the provision of six s136 hospital suites across Sussex, over two-thirds of those detained were taken into police custody in 2012.” In particular, the statistics indicate a need for more appropriate crisis interventions by ‘out of hours’ services and Sussex Police were the first force to receive funding for a Street Triage pilot study to develop alternative approaches to detention in 2013 in Eastbourne.

In the new Sussex model, the trained police response officers work alongside an experienced mental health professional after 5pm from Wednesday to Friday and all weekend – the times when most emergency calls come in. The team uses an unmarked car to reach situations quickly so the triage nurse can make a rapid initial assessment and provide appropriate help for the person in need.

“Although there will inevitably be some people who will be so distressed that detention under s136 may be the only way to save their lives, the triage process is far more likely to prevent this taking place when it is not necessary and can instead signpost the person to more appropriate help or intervention,” said Professor Bendelow. Triage-trained officers and health professionals are able to share information to develop a clear understanding of what is available locally and how best to access it.”

Early findings from the research suggest that for the police, using alternatives to s136, such as Street Triage has strengthened their relationship not only with Sussex Partnership Trust, but with all relevant agencies, including South East Coast Ambulance Service, the coastguards, the Samaritans, Grassroots Suicide Prevention charity and many other voluntary organisations. “This joined-up approach across all the agencies is the only effective way forward,” said Professor Bendelow. The next stage will be to link the findings from the Sussex pilot to other regional pilots to develop a national model of good practice based on this integrated approach.
Confronting Romaphobia

Dr Aidan McGarry’s research on the Roma has shone a spotlight on one of the last acceptable forms of racism in Europe and led to initiatives in Brighton to confront the marginalisation of Travellers.

Anti-Roma prejudice and persecution is growing across Europe, but much research and policy focuses more on the impact of discrimination rather than the causes. Dr McGarry’s work is being recognised for his insistence that governments and decision-makers address these causes. He has not only spoken in high level meetings, including for the Council of Europe, but has written two influential books with two more in the pipeline and has been involved in changing local policy on the treatment of Travellers.

Dr McGarry’s first book, Who speaks for Roma? Political representation of a transnational minority community, is a monograph on Roma politics based on his PhD. It was the subject of a three-book review in the leading academic journal Citizenship Studies covering the most important books on Roma issues in recent years. The book deals with the key barriers to effective political participation by Roma. Dr McGarry, a senior lecturer in politics in the School of Applied Social Science, co-authored a second book on migration and the rise of the far right in Europe. A third forthcoming book will deal with identity and social movements, and a fourth on Romaphobia, due out in 2016, will cover the issues of identity and territoriality that are at the heart of rights abuses against Roma people.

Dr McGarry has just received funding to support further research on Roma and territoriality. He said: “Most research focuses on the impact of prejudice, such as higher unemployment rates. Virtually no-one is working on the causes, the idea of the Roma being a nation without territory, of not belonging. It is this that is behind the idea that they can be treated differently, that they have no rights.”

For this research Dr McGarry will travel to countries in Eastern Europe with a high territorial concentration of Roma. One place he will visit is Prague, where a Roma pride parade is being held. Dr McGarry says the Roma pride movement has been building in recent years, modelled on gay pride events, and is part of an attempt to assert a positive Roma identity.

The idea for the Romaphobia book came out of an article Dr McGarry wrote on the acceptability of racism against the Roma in Europe for the website Open Democracy, following the supposed abduction of a blonde child by Roma in Greece last year. Dr McGarry’s research on the Roma also led to his appointment as the independent chair of the Brighton and Hove Traveller Scrutiny Panel whose aim was to scrutinise and inform the creation of the city’s new Traveller Strategy.

The panel won an award for the way in which it carried out the scrutiny process and influenced council policy. Brighton & Hove City Council’s housing unit attended all its meetings and has taken up the recommendation for a permanent Traveller site in the area. Dr McGarry says this is key to improving the health, education and job prospects of Travellers as well as their integration in local communities. He presented the panel’s recommendations to the council in 2012. The findings included the negative representation of Travellers in local media. One local editor was interviewed by the panel about his newspaper’s sensationalist coverage of Travellers. Stories about Travellers have since changed and are less negative. Dr McGarry said: “I found the experience to be incredibly rewarding, allowing me to apply my expertise as a researcher to a real-world issue. It was refreshing to come down from the ivory tower and put my knowledge to good use.”
Being able to take evidence from various voices around the city and within the Traveller community was really helpful in shaping an effective strategy with buy-in from different sectors.

Councillor Pete West, Brighton & Hove City Council
Peace through sport

Divided societies across the world have been brought together by the positive impact of sport, thanks to social intervention carried out by researchers at the University of Brighton through the Football4Peace initiative. Related innovative research is now creating opportunities for adolescent girls to grow into new empowering roles in their societies, all part of the potential change that sport can bring to the world.

Football is a universal language, part of today’s culture on every continent and in every section of society. Since 2001, academics from the University of Brighton have been working with sports and voluntary organisations around the world to help heal fractured societies and promote a fairer world. Football4Peace (F4P) emerged from a partnership between researchers at the University of Brighton and the World Sports Peace Project in Israel. Today, in many different countries, it has touched the lives of 8,000 children, nearly 600 coaches and some of the sport’s leading institutions, from England’s Football Association to the Korean Sharing Movement and the University of Johannesburg in South Africa.

Early research identified the primary challenges in developing and implementing F4P’s distinctive model of values-based coaching which is rooted in core values of neutrality, equity and inclusion, respect, trust, and responsibility. As the project grew, it confirmed that sport-based interventions can challenge prejudices in tangible and sustainable ways, helping to foster intercultural understanding and build stronger communities while at the same time embedding good practice for coaches, teachers and community leaders.

The impact of the F4P phenomenon has been felt in many parts of the world. Jane Shurrush, Manager of the British Council Israel’s regional office in Nazareth, commented on F4P’s work in bringing Jewish and Arab Israeli children together and training Israeli and Jordanian coaches alongside each other: “The research on F4P has shown that an approach that is developed alongside professionals in the field, accompanied by research that informs changes in project activity can have positive results that are not found in projects that simply bring people together without an informed approach. This methodology is now being implemented and expanded into other areas of sport.”

Michael Boyd, the Director of Football Development at the Irish Football Association (IFA) described his experience of F4P as “eye-opening” in promoting inclusion. The IFA has based its grassroots programmes on F4P, promoting the values in coaching to thousands of children in Northern Ireland and collaborating with partners north and south of the border.

Sport contributes to personal development and positive community relations but, too often, the integration of women and girls is overlooked. New research at the University of Brighton is helping to address this oversight by investigating the ways in which netball can help girls’ development through sport.
An equally important element to this programme is the way that the community sport coaches (CSCs) not only teach netball skills, but also become tangible role models for the girls. Through interactions with the CSCs, girls were subtly encouraged to reconsider previously accepted limitations that they had placed on themselves.

Research has shown how sport for women in countries of the Global South brings a wide range of benefits including learning about one’s physical capabilities and opening doors to social interactions in a way that few other activities can. Female coaches act as important role models, allowing young women to work alongside women who have received specialist training and who act as mentors.

Research on the potential of girls’ empowerment through sport is currently underway with The Goal-Delhi programme, led by Dr Megan Chawansky, from the University of Brighton and Dr Payoshni Mitra, an independent researcher based in Kolkata. Their research explores changes in Goal participants after completing the 10-month programme, which combines netball training with life skills modules on health and hygiene, communication skills, and financial literacy. This kind of programming gives them legitimate, safe and supervised access to a sport that otherwise might well be missing from their lives.

“Research tells us that adolescent girls can reap the benefits of sport participation. The girls we interviewed told us that they felt healthier and stronger from their participation,” said Dr Chawansky.

From the Football4Peace programme, building a new sense of shared humanity, to adolescent girls in India taking a more equal role in their families, the University of Brighton’s practical support and research on sport for development and peace (SDP) is helping to create stronger, fairer and more cohesive societies around the world.

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Jane Shurrush, Manager of the British Council Israel’s regional office in Nazareth

“Research tells us that adolescent girls can reap the benefits of sport participation. The girls we interviewed told us that they felt healthier and stronger from their participation,” said Dr Chawansky.
A researcher at the University of Brighton is working with UEFA, the Union of European Football Associations, and groups representing football supporters to ensure that fans are involved in initiatives to tackle racism, homophobia and violence.

Football fans often receive widespread negative media publicity for antisocial behaviours and politicians blame fans for causing trouble. Dr Mark Doidge, a researcher at the university, successfully led a project funded by UEFA to investigate whether anti-racist activism by fans challenged racism and xenophobia. The research was undertaken in Poland, Germany and Italy in order to gain an international, cross-cultural understanding of fan engagement.

The findings revealed the different tactics and practices fans have used to establish progressive activist groups to pressure football clubs, federations and governments to tackle discrimination.

As Dr Doidge said: “Football has the power to unite millions of people across the world. It also becomes a way for fans to divide and discriminate. Across Europe, football fans have engaged in racist abuse for several decades; no football league has escaped. Solving this problem has to go beyond simple punishment and legislation, and build on the positive actions already taken by some fans and grassroots organisations.”

As a direct outcome of this research Dr Doidge is now working with the Football Supporters’ Federation and Football Supporters Europe, using his findings to advise on how fans can be involved in anti-discrimination campaigns. He has also published a report on Anti-racism in European Football which he presented at UEFA’s headquarters in Switzerland.

“Racism is not only a problem in football, it’s a problem in society. Until we tackle it in society, we can’t tackle it in football.”

John Barnes, former England player

Empowering football fans to challenge racism

A researcher at the University of Brighton is working with UEFA, the Union of European Football Associations, and groups representing football supporters to ensure that fans are involved in initiatives to tackle racism, homophobia and violence.
Making elite sport competitive and fair is a key task for the University of Brighton’s Sport and Exercise Science and Medicine research centre (SESAME). The university’s researchers are leading the world in the search for effective anti-doping methods, with new science emerging that could provide a tamper-proof test.

We are fascinated with human performance – watching elite athletes break world records is something every sports fan wants to see. But we also want to see it done fairly: when an athlete is caught using performance enhancing drugs, the world of sport is diminished.

Some athletes take Erythropoietin (EPO) a banned hormone that boosts oxygen delivery to the muscles and enhances performance. Current drug tests can be beaten by injecting saline or drinking large amounts of water to dilute the blood. But science being developed at the University of Brighton by Professor Yannis Pitsiladis has discovered more than 50 genes which are switched on and off by EPO – biological activity that is impossible to hide.

“EPO works like a dimmer switch,” said Professor Pitsiladis. “As the EPO switch is turned up, more genes are ‘switched on’. Theoretically, it would be possible to manipulate these genes, but since each one will have numerous functions, it would be a difficult and potentially hazardous thing to do. So this approach might not yet be 100 per cent effective but we’re certainly on the right track to create a test which can’t be tampered with. We’re not looking for traces of EPO itself, we’re after evidence of what EPO does.”

The latest EPO research is focusing on ‘omics’, a novel approach to biological and genetic analysis which identifies and quantifies molecules that represent the structure, function, and dynamics of an organism, in this case an elite athlete. Professor Pitsiladis is pioneering an approach to human performance which combines analysis of genes, Ribonucleic Acid (RNA), metabolism and protein modification to produce a highly sophisticated set of drug detection tools.

The aim is to create drug-detection methods that are simple to use and cost effective. “The price of initial research is high,” said Professor Pitsiladis, “as it is for cancer or heart disease tests. But once the development work has been completed, partners like the International Olympic Committee and the World Anti-Doping Agency will have a low-cost test at their disposal.”

Alongside the research, the university has invested in a new state-of-the-art anti-doping laboratory with bio-banking infrastructure – freezers with cutting-edge alarm and monitoring systems. And the investment is paying off, with the International Federation of Sports Medicine (FIMS) awarding the Centre for Sport and Exercise Science and Medicine (SESAME) at Brighton, status as the FIMS Reference Collaborating Centre of Sports Medicine for Anti-Doping Research.

“One of the most challenging parts of my research is the assumption that drugs are the best way, if not the only way, to maximally enhance performance,” said Professor Pitsiladis. “If I could use the resources that are devoted to anti-doping to help athletes hone their performance using purely legal techniques such as intelligent training, I’m confident I could contribute to some new world records.”

A FAIRER FUTURE FOR WORLD-CLASS SPORT
The University of Brighton’s sports and exercise research findings have been adopted by elite athletes across the world and been praised by the International Paralympic Committee.

During the London 2012 Olympic and Paralympic Games, Dr Nick Webborn, Principal Research Fellow at the School of Sport and Service Management, was Chief Medical Officer for the Paralympics and worked with injured Olympic athletes. He also oversaw the collection of unique data on injury and illness from the 4,000 athletes taking part in the Paralympics. These data are generating a raft of research articles. “We can use this to work on injury prevention strategies,” said Dr Webborn. “We were able to collect 50,000 days of exposure of athletes to sport. It would normally take 25 years to get the same volume of data in a single sport in the UK.”

Dr Webborn, who was involved in London 2012 from the bidding stage through to delivery, has recently been appointed to the International Paralympic Committee’s medical committee and is organising the research taking place at the Games in Rio. Dr Webborn has also recently been appointed as Chair of the Scientific Commission of the International Federation of Sports Medicine (FIMS). His work at the Olympics has its origins in a study he conducted on injuries sustained at the 2002 Salt Lake City Winter Paralympic Games in the United States. The success of this first survey led the International Paralympic Committee to make the survey standard practice in all Winter and Summer Paralympics. Dr Webborn’s research into injury at the Paralympics has also led to rule changes for ice sledge hockey.

The University of Brighton’s links with London 2012 are only one example of its influential work with elite athletes around the world. This work has been adopted by the International Paralympic Committee, the US Navy and the 2016 Brazilian Olympic Committee, among others. The International Paralympic Committee
has acknowledged that the work has made a significant contribution to the Paralympic movement in relation to the education of clinicians in the field and improved medical care.

University of Brighton researchers have also been involved in ongoing work helping athletes involved in different sports and with different impairments deal with challenging climate situations. The work has influenced the strategy for Great Britain’s athletes from the Beijing 2008 Olympic Games onwards and also forms part of the USA Olympic Committee’s preparation manual.

The wider application of the University’s exercise research can also be seen in the team’s collaboration with the Peter Harrison Centre for Disability Sport at Loughborough University on toolkits that promote safe physical activity for people with various disabilities.

The recommendations of the toolkits have led to changes in how we deliver and frame our material to ensure that practical resources for people with disabilities to engage in physical activity can be sought.

Professor Vicky Tolfrey, Director of the Peter Harrison Centre for Disability Sport
A series of research collaborations with governments and organisations across Africa have had far-reaching effects on tourism policy making, skills capacity building and industry planning, core to local sustainable socioeconomic development in a number of destinations.

Tourism is often promoted as a panacea for development by several international organisations and commentators, which often tend to adopt a Western focused approach. Dr Novelli's view is that to be effective, tourism policy must be shaped in collaboration with experts on the ground.

Dr Marina Novelli’s collaborative work with a number of local partners in Africa has facilitated the reshaping of the tourism industry and contributed to sustainable local development.

As co-ordinator of the research group on Policy, Practice and Performance in Tourism, Leisure and Sport in the Centre of Sport, Tourism and Leisure Studies – CoSTaLS (an Affiliate Member of the UN World Tourism Organisation), Dr Novelli focuses on raising awareness among local people about the potential impacts of tourism on their lives, collaboratively working to build local capacity to address local needs. She said: “There can only be impact if there are local ‘voices’ involved.”

Dr Novelli has developed a participatory training method – the Peer-to-Peer Capacity Building approach – and employs the Rapid Situation Analysis, developed by one of her former PhD students, in most of her research. Amongst other methods, her fieldwork encompasses participatory workshops, collaborative community mapping, public consultations and a range of creative research approaches.

Dr Novelli worked on a UNESCO-funded project in Nigeria to review the leisure, tourism and hospitality curriculum, and delivered a capacity building/train-the-trainers programme aimed at co-producing teaching materials with colleagues from Kaduna State University. This resulted in the adoption of new industry and employment-centred curricula replacing the previous one dating back to colonial times.

In 2010, Dr Novelli was part of a consortium of five experts, including Dr Angela Benson, undertaking research into best available practices/technologies in nine African destinations as part of the United Nations Industrial Development Organization’s (UNIDO) Collaborative Actions for Sustainable Tourism (COAST) project. Dr Novelli’s research specifically on Nigeria and The Gambia, and Dr Benson’s work on Ghana led to the identification of training needs and government guidelines for conservation and ecotourism development.

Dr Novelli led World Bank-commissioned research into capacity building to improve tourism and hospitality vocational training in The Gambia. This study underpinned The Gambia Tourism and Hospitality Institute (GTHI) Bill published in 2011, which established the GTHI, encouraging Gambians to study up to the level of a Higher National Diploma in tourism and hospitality. The study influenced the Spanish government’s decisions on how best to spend their funds, which led to the allocation of a €2.7m budget for the GTHI infrastructure development, to become a national centre of excellence for tourism and hospitality education. The GTHI trains an average of 200 school leavers a year and will upgrade the level of professional training amongst the 30,000 workers in a tourism sector that contributes 16 per cent to the national GDP.
The value and impact that the peer-to-peer capacity building experience has brought to the village reach far beyond tourism development.

Geri Mitchell, Managing Director of Sandele Eco-Retreat and Learning Centre, The Gambia
Peer-to-peer learning for business excellence

Businesses tend to learn best from other businesses, valuing the real-world experience and the shared background that comes from managing a commercial organisation.

Academics at the University of Brighton have led the way on an 18-year journey helping small businesses around the world use peer-to-peer learning to become more profitable and increasingly sustainable.

Phrases like “sharing best practice” and “peer-to-peer learning” have become part of everyday business jargon, but research at the University of Brighton has ensured these approaches have measurable benefits for business and their employees. Peer-to-peer learning can happen informally, but a group of researchers from the University of Brighton’s Centre for Research in Innovation Management (CENTRIM) has played a key role in establishing a programme with systematic and regular processes underpinning such learning. This has helped to maximise the impact of the process on more than 1,000 small businesses in the UK, Ireland and South Africa. Peer-to-peer learning can happen informally, but a group of researchers from the University of Brighton’s Centre for Research in Innovation Management (CENTRIM) has played a key role in establishing a programme with systematic and regular processes underpinning such learning. This has helped to maximise the impact of the process on more than 1,000 small businesses in the UK, Ireland and South Africa. Over the past two decades, academics have worked with the leaders of these businesses using CENTRIM’s Profitnet programme to help them grow and thrive.

“The importance of peer-to-peer learning is well known,” said Dr George Tsekouras, a Principal Research Fellow in the Brighton Business School. “Our research has focused on creating a real understanding of how peer-to-peer activities work, what challenges the processes create and how peer-to-peer interactions can link small and medium enterprises (SMEs) with the knowledge base in universities. We established Profitnet to help embed the impact of our research in the business community.”

The university has established 84 peer-to-peer business networks in the UK, Ireland and South Africa, transforming the profitability and sustainability of the participating small companies. Evidence from SMEs in Sussex UK showed that firms that participated in Profitnet increased their gross profits by nine per cent compared with a decrease of 15.2 per cent in profits during the same period for non-participants. As well as profit growth, participants saw an 18.7 per cent increase in turnover compared with a 3.2 per cent increase for other local SMEs.

Since 2009, Profitnet has worked with a further 300 UK businesses together with 139 from Donegal in Ireland and 118 from Durban in South Africa. “Impacts have been very significant,” said Dr Tsekouras. “More than 90 per cent of participants have acknowledged improvements to their strategy skills, learning the value of planning in contrast to dealing with issues in a ‘fire-fighting’ mode. Furthermore, 85 per cent have improved their problem-solving skills, learning to delegate problem-solving power to employees and learning how to develop key performance indicators to monitor operations.”

Profitnet offers a unique opportunity for small business executives to receive feedback from a group of trusted peers and validate their business choices with them, something the participants describe as “a unique opportunity to have a board of non-executive directors”. Through the process of peer-to-peer learning, the participants develop strong communication skills, allowing them to interact successfully with other parties, whether business partners, suppliers or customers. It comes as no surprise that, in the long term, the participants are empowered with a high level of self-confidence.

Profitnet has had an impact on smaller businesses from all sectors, helping them to weather the recession and gain confidence in managing innovation, understanding the management demands imposed by new product development and developing ways of addressing different kinds of customer value.

As a result of the Profitnet project, the University of Brighton has helped hundreds of business owners and employees to build their skills, confidence and effectiveness through peer-to-peer learning.
Profitnet has been an enlightening way of bringing in experts so we can all pick their brains. Sometimes we need really specialist things, and it’s great for getting other people’s ideas – I have benefited from some very positive input.

Peter Adlington, Managing Director, Plastipack
A VOICE FOR YOUNG PEOPLE

Rights-based education researchers have been working with international non-governmental organisations (NGOs) to improve education outcomes and sexual health across the world.

Young people across the world have been given a voice in education and sexual health services through research led by the University of Brighton’s Education Research Centre in collaboration with Panos London and funded by the International Planned Parenthood Federation (IPPF).

Dr Vicky Johnson has been working with an international NGO to realise youth sexual rights and improve young people’s access to sexual health resources in developing countries. Her work is based on research she led in Benin, Kenya, Nepal and Nicaragua, and has resulted in IPPF deciding to reconceptualise its youth programming to put young people’s views at the centre.

Dr Johnson designed the methodology in which researchers in the different countries interviewed young people, adults and service providers. She also worked with young peer educators and trained them to carry out their own research.

They successfully encouraged the most marginalised young people – from young people working in hard labour to sex workers and transsexuals – to depict their lives in photographs, and to tell their stories about access to sexual health services and to share their feelings about their sexual rights.

Findings from the youth-led research showed that young women in a mountainous region of Nepal were scared to say what was happening to their bodies. They described themselves as feeling like ‘trees with no leaves’ because they could not show their emotions due to gender violence and discrimination. Young peer educators took a picture of a rose coming into bloom to illustrate how young people of the ‘third gender’ should be able to be open about their sexual identity.

Young people appreciated the mobile health units funded by IPPF, which travel to poor rural areas and now include a separate space where young people can talk and access contraception confidentially. Service providers were trained to be more user-friendly and the focus was on building healthy relationships rather than illness. Following the research, Dr Johnson and the peer educators presented their findings to local, national and global staff and decision-makers.

The Programme Specialist for Adolescents and Young People at the South Asia Regional Office of IPPF, Manish Mitra, discussed how the research had illustrated positive change in Nepal as a result of IPPF’s interventions and that this had informed local funding decisions to continue services for vulnerable young people: “The life-changing impact the project has made in the lives of the young people in FPAN (Family Planning Association Nepal) in particular presents impactful learning for all our Member Associations (MAs) across the region. The assessment research has brought out excellent examples of MAs’ work in promoting and advocating for provision of comprehensive sexuality education in the national curriculum of Nepal.”

Dr Johnson designed the socio-ecological theoretical model from the research that is informing IPPF’s ongoing youth programming. She said that understanding the cultural context in each country through the eyes of young people was vital. Experiences differ from country to country. For instance, in Benin young people felt it was important to involve religious leaders and radio stations in sexual health education. In Nicaragua girls felt under pressure in their local community to get pregnant early. In Kenya young people felt sexual rights could not be addressed without confronting economic problems. “The important thing is for young people to be able to talk and that they are supported to be agents of change,” Dr Johnson said.

Although the programme is over, the journey is not. It will have an enormous impact on our strategic thinking in IPPF... influencing our work with over 20 million adolescents and young people in 152 countries. It will have implications for IPPF’s approach to communication and management.

Doortje Braeken, IPPF’s Senior Advisor on Adolescents

Helping Europe tackle youth unemployment

A €5m European Union research project on youth unemployment, using innovative multidisciplinary approaches involves the voices of young people and businesses from the outset.

Across the European Union over 5 million young people under 25 are unemployed. In the worst affected countries in southern Europe, more than 50 per cent of young people are without work. In the UK three-quarters of a million young people are looking for jobs. A new project, led by the Centre for Research on Management and Employment (CROME) at the University of Brighton Business School, is using state-of-the-art academic analysis to produce policy recommendations and practical resources in collaboration with organisations aimed at helping young people find work.

The four-year project Strategic Transitions for Youth Labour in Europe (STYLE) began in March 2014, and builds on a range of established international networks and projects funded by the Leverhulme Trust and Santander Universities.

“Previously, we found that ‘governed’ internships, linked to educational programmes or active labour market policies, are much more likely to have beneficial outcomes than unregulated ‘open market internships’. Positive governance conditions relate to contract, duration and partnership arrangements. When employers, interns and educational providers understand the mutual benefits is when they work best,” said Dr David Lain, early career researcher at CROME, who is leading the research on internships.

STYLE marks an ambitious step up from this initial research. It examines labour market mismatch in terms of education and skills, mobility and migration, as well as the potential for youth business start-ups in Europe. The project is generating new ideas about the legacy of long-term unemployment in some parts of Europe and the changing nature of skills for new types of jobs.

Central to the project are a number of international advisory partners, including the Organisation for Economic Co-operation and Development (OECD), the International Labour Office (ILO) and the European Youth Forum, together with a representative group of 24 universities from 20 countries across Europe. Employers have a key role to play in the project through the advisory network, which includes temporary work agencies and Business Europe, an organisation that represents the views of a range of enterprises in 33 European countries. The project’s advisory boards meet regularly to discuss the specific issues in their communities and the research analysis.

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Professor Jacqueline O’Reilly, Director of CROME and Co-ordinator of STYLE, said: “These advisory boards are a really important part of the project and its potential impact. They know what the issues and barriers are on the ground, and we need to listen to them to inform our research. Impact is about the young people at the heart of the project informing policy recommendations. A powerful collaboration at Brighton between the Business School and CUPP, the Community University Partnership, has built leading research expertise aimed at helping young people in the UK.”

The real value of CROME’s research will be its in-depth analysis into the skills gap and ways to tackle long-term unemployment effectively. It is very exciting to be involved in something that brings us so close to the latest academic research. I am very keen personally that we have something that unites an academic, rigorous policy approach with the fieldwork we do and have been doing for years.”

Abi Levitt, Director of Development Services at the employment charity Tomorrow’s People
As noted in the evaluation report, the next stage of development is the sustainability of this learning through a cascade model. In some areas this sustainability has already been achieved, as confirmed by one principal in Zambia: “I do not look at QEP as a project. A project has a life-span. Projects come and go, QEP is a programme. It has come to stay. It is an integral part of our work and life at the College.”

Hundreds of thousands of teachers and young people across the world have been given a voice in education through two complementary research projects led by researchers in the University of Brighton’s Education Research Centre.

The first research project, The Quality Education Project (QEP), led by Professor David Stephens, focused on 300 primary schools, 1,000 trainee teachers and 120,000 children in four sub-Saharan African countries, and resulted in the implementation of new policies towards teaching-learning.

Professor Stephens developed culturally sensitive participatory action research to analyse, promote and evaluate strategies to improve the quality of teaching and learning through a learner-centred methodology and reflective teaching. Using indigenous research teams to carry out classroom observations, interviews with teachers and pupils, and a comparison of examination scores taken from project and non-project schools, the research had a clear impact on learning outcomes.

A recent evaluation of the impact of the research by the independent consulting group EDCON found significant differences in the cognitive achievement of children taught in project as opposed to non-project schools: “In Zambia, where the schools in which we administered the tests were similar, we found statistically significant differences both in 4th and 6th grade, both in Language and Mathematics.”

The evaluation also found evidence of impact on teaching, “through classroom observation we found that project-trained teachers pose more open and challenging questions to their pupils, and they give them more individual help.” As a headteacher in Zimbabwe said about the QEP-trained teachers in his school: “They seek new ways of teaching different topics to different children of different abilities.”

The results of University of Brighton research jointly undertaken with governments and schools in Africa and the UK have boosted educational performance and improved young people’s awareness of their human rights.
The second project was led by Dr Carol Robinson and was funded by UNICEF to evaluate its Rights Respecting Schools Award (RRSA), taking into account pupils’ views. Her findings on the value of a rights-respecting discourse were adopted by UNICEF UK and in his 2010 Review of the Office of the Children’s Commissioner, Sir John Dunford, who acts as an adviser to the House of Commons Select Committee on Education, said: “In conducting my review I visited some Rights Respecting Schools and saw at first hand that when children are taught about their rights they learn a greater appreciation of the rights of others. The evidence is that this has a positive impact on behaviour and teacher-pupil relationships. Rights, respect and responsibility are the three Rs of learning to be a good citizen.”

Sir John Dunford, Review of the Children’s Commissioner for England, 2010

Not only did it go on to form the basis of an international conference convened by Save the Children in Cambodia in 2009, but it has also impacted Save the Children’s international policy development. Professor Stephens is following up this research in Bangladesh where he is working with a number of European Union-supported non-governmental organisations to deliver more effective teaching and learning to children of the Dhaka slums and Sylhet tea estates.
Partnerships with communities to address disadvantage

Every university works closely with its communities, but Brighton’s Community University Partnership Programme (CUPP) is recognised as a world leader in embedding the notion of mutually beneficial research relationships at the heart of its social engagement work.

Working with local people to identify, shape, undertake and disseminate research is helping the University of Brighton to make some unique contributions to communities locally and outside the UK, giving students and academics valuable opportunities in pioneering a research-based model of community-university engagement that has gained international recognition.

“From the establishment of the Community University Partnership Programme (CUPP), in 2003, one of our governing principles has been the notion of mutual benefit, and that’s very important to us,” said CUPP’s director Dave Wolff. “Our research projects need to have a clear benefit to the community, but they also have to enrich the research and the teaching of the university.”

A central tenet behind CUPP’s approach to facilitating research is that academic knowledge is important and valid, but not uniquely so. The knowledge of professionals, practitioners and community partners is equally valid and can be equally important in the definition of research questions and the research process.

CUPP is funded as a core function of the university and, distinctively, the programme is an integral part of the University of Brighton’s corporate plan. “The reason CUPP works is that we’re pushing at an open door,” said Wolff. “Staff and students are keen to use their expertise and energy to help address inequalities in our communities whilst they develop their research and learning, and, in turn, our communities are open to the idea of developing their practice with their local university to tackle marginalisation and disadvantage.”

The CUPP team works with colleagues across the university to turn ideas and community priorities into research projects; it provides start-up funding and helps research networks and communities of practice to develop. In addition, CUPP’s community research fellowships enable community partners to have full access to resources such as computers and library facilities.

CUPP has enabled hundreds of research partnership projects to take place, resulting in new research findings which have been used to tackle disadvantage through: the development of new resilience initiatives for disadvantaged young people in the UK, Sweden and Greece; novel forms of inclusive arts practice with people with learning disabilities, which have been displayed on London’s South Bank; an enduring programme that links pharmacy students with older people in a befriending relationship, via which the older person’s medication is reviewed; and improved approaches adopted in the UK and Australia for understanding the needs of LGBT communities to inform new policies.

Wolff noted that “CUPP’s reputation is such that we now get enquiries from other universities within and outside the UK asking how they can develop community-university engagement strategies.” Staff from CUPP are now working closely with universities in Bosnia, Ethiopia, Senegal, Ghana and Kashmir, supporting them to make their own contributions to addressing marginalisation and disadvantage in their local communities.
CUPP’s work at the University of Brighton has been a significant inspiration to everyone who has encountered their unique approach to university-community engagement. CUPP has become a real magnet for anyone – whether from across the UK or internationally – who cares about effective university public engagement. It is one of the great ‘engagement’ success stories of the last 10 years.

Paul Manners, Director of the National Coordinating Centre for Public Engagement (NCCPE)

Involvement in CUPP also gives the university’s own students access to a much broader set of experiences as one undergraduate described: “As a student you live in an incubated world, and this has enabled me to become part of a wider community and it has challenged my learning in the other courses I take.”

Conversely, local community partners in Brighton benefit from new thinking and a fresh set of challenges. “It’s been brilliant working with the university and having an independent person to talk to,” said the Director of an older people’s community organisation. “To get out of your own context is very refreshing.”

But, as Wolff reiterated, the academic needs of the university need to be met, alongside those of the community. “CUPP is not working with our communities as a form of charitable largesse,” he said. “We have a hard-nosed focus on improving research, and beyond that of including the knowledge held by practitioners and community members to create better research that can be used to make fundamental improvements to people’s lives.”
COLLEGE OF ARTS AND HUMANITIES
A pioneering project that breaks down the barriers between science and technology and cultural heritage is transforming the way we view history.

How do you both bring history to life and change the boundaries of our knowledge about it? The University of Brighton-led European Network of Excellence in Open Cultural Heritage (EPOCH) – has brought together over 600 technologists and heritage experts to create working methods and a common vocabulary and to set an agenda for future research. The network is also developing tools for recording and analysing cultural objects, and for strategic planning and socioeconomic impact evaluation within cultural organisations.

These tools were identified in the EU’s final review as making “ground-breaking progress in developing innovative methods and theory in the economics of cultural heritage”. EPOCH, which was coordinated by Professor David Arnold of the Cultural Informatics Research Group, has spawned a number of centres of expertise and played a key role in the establishment of Digital Intangible Heritage of Asia.

The network also gave rise to 3D-COFORM, a four-year University of Brighton-led project which began in 2008. Its aim was to make 3D documentation practical and sustainable for cultural heritage institutions, and to enable mass 3D-acquisition by these organisations.

The multidisciplinary project, a collaboration between 19 partners, culminated in the Reshaping History exhibition held in Brighton in 2012. 3D-COFORM ran over 30 deployment experiments, combining tools to address curatorial challenges, test technologies and integration, raise awareness, and train a new generation of heritage professionals. The 2012 exhibition showed each stage of the integrated workflow in 3D exhibits demonstrating innovative technologies applied to iconic heritage content. For example, Michaelangelo’s David, where plans have developed to use 3D modelling to determine whether cracks in the statue are getting larger over time.

The 3D-COFORM exhibition was designed to inspire and inform people working in cultural heritage and the public about the potential of 3D computing within the cultural heritage world. The exhibition has been shown around the world, and been translated into both Italian and Portuguese, attracting more than 10,000 visitors and considerable international media coverage. It arrived in Brazil in August 2014 for a two-month run in a new gallery opposite Sugarloaf Mountain and is planned to tour several locations. Stephanie Smith, Sussex Finds Liaison Officer, Portable Antiquities Scheme, called it “an absolutely brilliant undertaking explaining why 3D technology has the potential to completely change the way we create, incorporate and explore archaeological finds.”

Not only has the 3D-COFORM project provided the tools necessary for 3D work in cultural heritage, but it has played a vital role in establishing a new interdisciplinary area between science and engineering and arts heritage, cemented through the new EPSRC-funded Centres for Doctoral Training in Science and Engineering for Arts, Heritage and Archaeology.

The 3D-capture and associated processing tools developed by the project enable researchers in the arts and humanities to study cultural artefacts in ways that have not been possible before, for instance, enabling broken artefacts to be reassembled and accessed online. The 3D technology has already exposed brush strokes on Rubens’ “The Young Anthony”, a painting of the young Van Dyck, that suggest it was, in fact, a self-portrait. The project has become a leader in digital cultural heritage, attracting interest from cultural bodies such as the Berlin State Museum, the Louvre and the Royal Museums of Art and History, Brussels.

An absolutely brilliant undertaking explaining why 3D technology has the potential to completely change the way we create, incorporate and explore archaeological finds.

Stephanie Smith, Sussex Finds Liaison Officer, Portable Antiquities Scheme
The project has delivered breakthrough work on several aspects of the development of 3D technology for the cultural heritage sector. The 3D-COFORM project introduced heritage institutions and the public to the applicability of 3D within the sector.

Chris Vastenhoud, Royal Museums of Art and History, Brussels

The project has also contributed to international standards in the interchange of cultural heritage information and has been instrumental in introducing 3D models to Europeana, formerly the European Digital Library. 3D-COFORM established a Virtual Competence Centre for 3D, which will provide independent advice on 3D technologies to cultural institutions and has widened public access to heritage information. Professor Arnold said: “Not only will 3D technological innovation transform working practices for cultural professionals, but the public are used to digital technology and this has raised their expectations. 3D brings history to life in a way that photos cannot and the internet opens up heritage material to a much wider community.”
A leading thinker on sustainability has come up with the notion of emotionally durable design. His theories are now making an impact with some of the world’s biggest brands.

We live in a throwaway society, but why do we discard things that still work and how can we design products that consumers will want to keep for longer? These are questions that a University of Brighton academic has been investigating for the past decade. Today, his research is making an impact in the design studios of some of the world’s leading businesses.

“We seem to be addicted to the new,” said Professor of Sustainable Design Jonathan Chapman, “and I find the relationships we have with products fascinating. Our research with consumers identified change over time as the key issue. We need to create relationships between consumers and products that get continually reinvented, and that’s the dominant idea of emotionally durable design: I’m arguing for the design of new experiences, not new products.”

One of the biggest impacts has been at leading sportswear brand PUMA, where Professor Chapman’s ‘50 Ways of Thinking and Doing Sustainable Design’ toolkit now has centre stage at the company’s five design centres around the world. He devised a sustainable design competition with PUMA, run exclusively with students at the University of Brighton, to develop cutting-edge sustainable design proposals to advance thinking across PUMA’s product categories (see image). Together with PUMA, he also led the 2012 sustainable design master-class series, joined by lead designers and strategists from Adidas, IDEO, H&M, Seymourpowell, Marks and Spencer, ASOS, and other leading consumer businesses. These expert sessions featured keynote lectures, exhibitions and workshops from a range of invited sustainability specialists, including College of Arts and Humanities academics Nick Gant and Tanya Dean.

The corporate mood has fundamentally shifted over the past 10 years. Emotionally durable design was once described as radical or interesting, today’s leading businesses describe it as strategically important.

“Chapman’s research has advanced our thinking on sustainable design,” said PUMA’s Global Director PUMA Safe Dr Reiner Hengstmann, “and made a considerable contribution to our quest for enhanced resource efficiency, and increased product and brand value. His lectures, masterclasses, workshops and training films have helped to move our sustainability story forward by shaping the attitude..."
Chapman’s research has advanced our thinking on sustainable design and made a considerable contribution to our quest for enhanced resource efficiency, and increased product and brand value. His lectures, masterclasses, workshops and training films have helped to move our sustainability story forward by shaping the attitude and approach of our designers and management teams.

Professor Chapman’s research has been widely adopted by professional designers at some of the world’s largest businesses including Sony, Philips, H&M and Clarks. Today, the term ‘emotional durability’ is adopted by designers, students and educators around the world, providing valuable shorthand for the psychological factors that determine the endurance of products.

As well as extensive media coverage in the UK and around the world, emotionally durable design has been highlighted by the House of Lords as a key tool in reducing e-waste and increasing the lifespan of domestic electronics. Written and oral evidence was presented to the Lords’ Science and Technology Sub-Committee, which in turn informed the Government’s latest Waste Policy Review in 2011, placing Professor Chapman’s research at the leading edge of a sustainable future.
The Smart e-bikes project, led by Dr Frauke Behrendt, investigates how the public engages with electrically-assisted cycling, and considers how policy, training, design and product development might lead to a higher uptake of e-bikes in the UK, potentially reducing carbon emissions and improving health.

The e-bikes used in the study (also known as pedelecs) are electrically assisted bicycles that enable people to cycle for work or pleasure with optional motorised support. The rider still has to pedal but the rechargeable battery assistance can make it easier to cycle, especially against the wind or uphill.

Smart e-bikes have been loaned to 100 commuters and community groups for trial periods of six to eight weeks. The fleet of bikes have specially developed monitoring systems with sensor integration. Each e-bike looks and works similarly to an ordinary bicycle but includes the rechargeable electric motor.

The amount of assistance from the motor reduces with increasing speed and cuts out altogether once the bike reaches 15mph or if the rider stops pedalling.

E-bikes can encourage more people to cycle – or encourage people to cycle more. They are particularly useful for commuters who want to arrive unruffled, older age groups, people with physical limitations, tourists and ‘last mile’ delivery of goods. The Smart e-bikes project monitors data for the bike’s location and the rider’s activity, and feeds to an online interface for analysis. Riders can also view their own data and share it via social media. This data sharing turns singular e-bikes into a networked fleet.

The future vision is to make the greater Brighton and Hove city region the UK model for demonstrating the game-changing potential of electrically assisted bikes. While the social, economic and environmental benefits of e-cycling have already been demonstrated in several European countries, the UK still has to realise this potential. E-bikes, and especially ‘smart e-bikes’ could be a showcase for the local innovation at the intersection of the high-tech industry and sustainable technology. The aim is to work with local, regional and national institutions, government, and industry towards an evidence-based e-bike strategy that includes leisure cycling, commuter cycling, cycle tourism and ‘last mile’ delivery.
Several local companies have consulted the project researchers on their business and developing innovations, for example regarding the tracking of fleets and goods. One of them is ReCharge, with Founder Sam Keam stating: “The smart e-bikes project has supported us in developing our vision for more sustainable urban logistics…Brighton struggles with congestion, air pollution, lost business productivity and a reduced quality of life because there is too much traffic – a fair chunk of which is vans whizzing around delivering goods.”

Use of such bikes will therefore be of potential health benefit to all those who need to increase their levels of physical activity and who use them in preference to undertaking less active types of travel or activity.

Nanette Mutrie, Professor of Physical Activity for Health, University of Edinburgh
Bob Harber, one of our Brighton-based e-cycle trainers stated: “It gives new horizons to people who might otherwise have been in a car. I love to observe the sudden realisation of possibility by those participating in the e-training.”

Dr Behrendt has been consulted by Brighton & Hove City Council during the process of writing local travel strategies with major interest now growing in the potential of e-bikes. The research considers how the uptake of the system can be influenced and, with a view to the multiple public and private benefits including lowering carbon emissions and improving health and wellbeing, it looks at how training schemes can play a key role in facilitating the adoption of electric cycling.

A pilot e-cycling training module was developed in collaboration with Maria Robinson from M-Cycles (a local cycling business). Bikeability is ‘cycling proficiency’ for the 21st century, designed to give the next generation the skills and confidence to ride their bikes on today’s roads. The project will influence the national Bikeability curriculum, offering an emphasis on e-bike skills, especially aimed at adults. This, in turn, feeds the aim of several national institutions to encourage more people to take trips by bike more often and more safely.

We are starting to work in partnership with Frauke Behrendt from the Smart e-bikes research project to put together a CPD (continuing professional development) trainer training module to submit to the Department for Transport for possible inclusion in the Bikeability suite. This will extend our reach to adult audiences and respond to the growing public interest in e-bikes.

David Dansky, Director of The Association of Bikeability Schemes CIC

Bob Harber, one of our Brighton-based e-cycle trainers stated: “It gives new horizons to people who might otherwise have been in a car. I love to observe the sudden realisation of possibility by those participating in the e-training.”

The project is positioned at the intersection of more traditional cycling research, mobile media studies and user-centred design. It has aimed to understand electric cycling as a unique mode of transport, with distinctive potential and challenges in the UK context.

Augmented with video cameras, mobile phones and other sensors to collect more qualitative and ethnographic data, this investigation into the full potential of smart e-bikes promises to have a positive effect on many issues in the contemporary city, from traffic to individual well-being.
The study demonstrates that traditional approaches to design that focus primarily on ‘desirability’, ‘inclusivity’ and ‘mass market’ are not, in their current form, adequate to address the complex health needs of modern society. His research argues for design innovations that integrate health into everyday life and promote resilience in health, enabling people to live longer, happier, lives, and reduce the need for long-term assistance and support.

Through his research, Dr Ainsworth aims to increase the integration of objects and environments that encourage healthy activities into the home, the workplace and social spaces through the development of new business models and design values. The growing impact of his ideas has nurtured close collaborations with colleagues at Brighton and Sussex Medical School and Arthritis Research UK, in addition to co-developing new projects with a range of external partners including the Helen Hamlyn Centre for Design at the Royal College of Art and the Design Council UK.

Dr Tom Ainsworth’s recent research utilises behaviour design theory to encourage beneficial exercise amongst patients with rheumatoid arthritis (RA). At the intersection of a number of disciplines, including design, social psychology and healthcare, his research seeks to enable the development of design interventions that influence a person’s attitude or behaviour for the benefit of their health.

The research identifies ‘designable factors’ – ideas, objects, and environments (virtual and real), which are specific to people with RA. These can then be understood and selectively influenced to increase the ability and willingness of patients to engage with long-term therapeutic exercise recommendations. Dr Ainsworth’s work also explores existing motivations and interests in the activities of daily life that can be targeted to incorporate therapeutic exercise interventions.
Understanding past violence

From the Troubles in Northern Ireland to Apartheid-era South Africa, and from the Balkans in the 1990s to England in the 1940s, academics at the University of Brighton are helping to understand violent conflict and its effects on those who survive it.

“Those who cannot remember the past, are condemned to repeat it.” Spanish philosopher George Santayana’s insight has particular resonance for a group of researchers from across the arts, humanities and social sciences, who are focusing on the ethical and political justifications of violence, and the way in which cultures deal with their experiences and fear of conflict.

Cultural and social historian Dr Lucy Noakes from the College of Arts and Humanities engages with the relationship between the social and cultural history of war and the cultural memory of warfare in post-war societies. She has recently explored the impact of wartime death on the psychic, geographic and cultural landscapes of post-World War Two Britain, finding shifting ground as cultural memories evolve.

“Wartime propaganda of the ‘chirpy cockney’ endured for decades and influences cultural memory today,” said Dr Noakes. “The notion of ‘we’re all in it together’ is a valuable political trope still in use – nowadays to describe austerity rather than the Home Front – but in the 1940s there was a stronger reality attached to the phrase. But this reinvented cultural memory doesn’t reflect the people wetting themselves with fear when the air-raid siren sounded. It’s very hard to talk about bad memories, and it’s much easier, indeed quite seductive, to adopt the publically acceptable cultural memory rather than the repressed fears of the individual.”

Related research on the First World War led to Dr Noakes’ involvement as co-investigator in one of five AHRC-funded public engagement centres in conjunction with the Heritage Lottery Fund. The aim of the UK Gateways to the First World War co-ordinating centre is to provide support for community projects that bring together academics and members of the public through research and commemoration of the war at its centenary. “The centre directly supports community groups funded by a range of HLF programmes, particularly through its new £6m First World War: Then and Now community grants scheme,” said Dr Noakes.

Activities organised through the Gateways project include talks, open days and study days to help understand the legacies of conflict and the process of commemoration, and to support this practice within local communities. The Gateways project, which will also provide research training, and link with schools and education projects, advises on sources and archival work, as well as creating opportunities for reflection on what it means to commemorate the centenary of the First World War.

Graham Dawson, Professor of Historical Cultural Studies in the College of Arts and Humanities has explored the ways in which individuals and communities deal with the past within conflict resolution processes, and his widely respected work has resonance with Dr Noakes’ current research. Professor Dawson’s work is about composing a narrative notion of the experiences of the past, helping to make us feel composed about the present. Individual narratives might be factually flawed, our memories unreliable, but our narratives are composed to help us deal with the sometimes difficult and traumatic, or perhaps just inconvenient, memories that are hidden away.

One interview with a veteran of the Dunkirk evacuation included a mass of detail from geographically dispersed places and from a series of events that no one individual experienced. It became clear that he had constructed his narrative from films and documentaries, despite the fact that he had experienced the evacuation himself at first hand. “I think we use these public images as a way of giving voice to our experiences in a publically acceptable way,” said Dr Noakes. “We want to claim our part in the big public events of our time, but we try and do so in a way that conforms to the accepted narrative.”

With a wide range of applied and interdisciplinary research across the humanities aiming to understand war and political violence, University of Brighton academics are helping to create the tools that can one day be used to intervene and prevent future violence.

Photograph: The British Airborne Division at Arnhem and Oosterbeek in Holland. O’Brien (Lieu). © IWM
University of Brighton research on digital technologies and inclusion has had an impact on sustainable community development in the south-east and beyond and has helped promote peace following post-election violence in Kenya.

The University of Brighton puts community engagement at the very heart of its mission. This is apparent in its pioneering research on digital communities. Gillian Youngs, Professor of Digital Economy, said: “Brighton is one of the leading universities in innovative community engagement based on a distinctive cross-disciplinary ethos of working with communities.” The College of Arts and Humanities research on digital technologies in rural communities extends from Brighton to Kenya to help create democratic and inclusive spaces for people to interact.

The University of Brighton’s work in this area has always placed user needs at the centre of the digital revolution. In the 1990s research by Professor Karamjit Gill developed a model that brought together researchers, practitioners, entrepreneurs and social and cultural actors in ways that emphasised individual creativity and personal empowerment in the emerging networked society. This work has been built on by researchers such as Dr Peter Day, a Senior Lecturer in the College of Arts and Humanities, and Professor Flis Henwood, Professor of Social Informatics in the College of Social Sciences, in ways that have explored different dimensions of the digital divide and led to research that looked at how breaking down that divide could reinvigorate civil society.

A pilot study for the Community Network Analysis & Information and Communication Technologies project found that digital technologies would reach a more inclusive group of people if they were shown to have an application to people’s everyday lives. At the same time, Nick Gant, a researcher in the College of Arts and Humanities, developed a community planning and networking tool, Community21 (Digital Toolbox for Sustainable Communities), which brings together a range of digital interface, participation and content management methods to enable communities to utilise smart technologies in the co-design of their future.

The project has spurred greater involvement and inclusivity in community planning and design and has enabled local people to adopt roles as the ‘architects and planners’ of their own community futures and neighbourhoods under localism legislation. Uniquely, this has included the collaborative design of new, freely available technologies or ‘digi-tools’ developed for children and old people who have taken part in digital citizenship and envisioning workshops.

We have used the materials made by Dr Peter Day and his teams in our work on reconciliation and peace-building in relation to inter-tribal relations. It has been most valuable in helping us give a voice to victims and those previously disenfranchised from public debate.

Krispus Kimani, Focus Youth Initiative, Kenya

Action in rural Sussex (AirS) adopted the research in its Business Plan and its CEO, Jeremy Leggett, said: “The principle of neighbourhood and community planning is now vital to our policy implementation phases.”

Research on digital communities has also had international applications. Dr Day worked with ITSkills4RuralKenya, a charity that focuses on removing barriers to digital literacy.
Through the provision of audiovisual filming technology, training and enhanced access to ICT in the community – over 200 centres in rural Kenya received 20,000 computers, potentially reaching two million people. Dr Day then extended the university’s research in Kenya as part of a peace and reconciliation process following inter-tribal tensions in the wake of the 2007 election.

The researchers worked with the Focus Youth Initiative and as a result young Kenyans from across ethnic groups created videos that reflected on post-election violence. The process helped to build a sense of political empowerment. Together with a number of groups and organisations from Kenyan civil society these researchers have formed a partnership network called CommunityMedia4Kenya. They are currently working on developing community information centres using networked Raspberry Pi technology and setting up a community radio initiative in the Rongo area of Migori County.

Professor Youngs, whose long-standing work on inclusion and digital technologies informed an inquiry on Designing the Digital Economy which she co-chaired, said: “Brighton’s multidisciplinary work on digital technologies is research-informed, but focused on practical applications in specific locations. This approach creates a rich tapestry, showing how the university is working in creative and multi-faceted ways with communities.”
University of Brighton academics have been pushing the boundaries that separate art and life, and developing a more inclusive approach to performance.

The world of performance art is becoming more inclusive and engaged, in no small part due to the work of academics at the University of Brighton. Professor Liz Aggiss, Billy Cowie and Alice Fox from the College of Arts and Humanities have pioneered different ways of working with marginalised and under-represented communities in new and unexpected places.

Their work has been seen by people in over 40 countries via 230 performances, public screenings, festival presentations and widespread online dissemination, and has won international media coverage. Using musical composition, voice, sound, choreography and time-based media technologies, they cover issues such as ageing, identity and disability in their performance practices, and seek to blur the relationships between performers and audiences and art and life.

Professor Aggiss and Billy Cowie’s work saw them named ‘performance ambassadors’ by the British Council as part of its Forward Motion tour to promote UK art. The tour included lectures and masterclasses by Professor Aggiss and their long-term collaboration has pushed the boundaries of screen dance, blurring the line between high art and popular culture. They have been invited to international festivals and their award-winning dance for camera work Motion Control, featured in Time Out: London’s Top Ten Dance Videos on the Web, has had around 100,000 YouTube views. Motion Control generated debate about inclusion, feminism and geopolitics. Other work has included 3D and holographic dance installations.

Fox’s research has led to paradigm shifts in how inclusive performance is viewed by, for example, government-funded bodies, community groups and arts organizations. Her work on inclusive performance includes the Artists on the Move project with partners in Ireland and the Netherlands. The project involved each organisation giving a public exhibition and creative workshops to share best practice. Fox’s Side-by-Side was commissioned by the Arts Council and London’s Southbank Centre and attracted over 6,500 visitors. It brought together 150 able-bodied and disabled artists, representing the collaborative approach and outlook of 30 international organisations.

Fox and Dr Hannah Macpherson from the School of Environment and Technology are just embarking on writing the first book on the theories, research methods and practice of inclusive arts: Inclusive Arts Practice and Research: a critical manifesto. Fox, founder of the university’s pioneering MA in Inclusive Arts Practice, says the book, to be published in spring 2015 by Routledge, could be seen as a manifesto for inclusive performance. It is based on her own experiences and those of a wide range of influential artists and thinkers from Europe and the United States, including Jude Kelly, Artistic Director of the Southbank Centre, US artist Suzanne Lacey, Anna Cutler Director of Learning at Tate and Andrew Pike from Kilkenney Collective for Arts Talent (KCAT) Arts and Study Centre.

The book will identify what inclusive practice is, what makes it unique and how it is situated within historical, cultural and contemporary practice. True to the discipline the book itself will be collaborative, an image-rich hybrid of academic essays and accessible summaries. The cover will be designed by an artist from the learning disabled Rocket Artists, of which Fox has been Artistic Director since 2003. She said: “Our aim is to name and describe inclusive performance and position it as an emerging practice.”
The exhibition shifts a paradigm by making us understand that art created by people with different life experiences gives us fresh perspectives on ideas around what is possible for an artist, both practically and emotionally.

Jude Kelly, Artistic Director of the Southbank Centre

Photograph: Alice Fox and Louella Forrest Measures of Bodies performance, European Academy of Childhood Disability conference, Brussels.
Photograph: Left – Eumig C16 a 16mm amateur cine camera from the 1950s.
Right – A Pathé Baby 9.5mm amateur cine camera from the 1920s.
Brighton has provided a moving past for the region, the nation and beyond. There are many ways of accessing the past but moving images offer a unique insight into how we lived our lives during the twentieth century. One of the University of Brighton’s leading art and film historians has been instrumental in opening up the world of film through Screen Archive South East.

From rural life to seaside holidays and from wartime information to peacetime celebrations, a unique record of life in south-east England has been collected, preserved, curated and made available through Screen Archive South East (SASE) and its Director Dr Frank Gray, a member of the University of Brighton’s College of Arts and Humanities.

“The interesting thing about a film archive is the number of different ways in which it’s used,” said Dr Gray. “There’s an assumption that a film archive serves the needs of film historians, but the reality is that we transcend the specificities of film and film history and serve multiple histories, whether it’s domestic and social history, or rural and agricultural history, or military and conflict history.”

As well as being a fascinating resource for anyone interested in the past, the archive has special value to museums and to broadcasters as well as academics and researchers. Recently, film-makers from France and from the USA have found important resources for programmes on the Second World War. A short film of children from Hove putting on gas masks has become emblematic of life in wartime Britain for a global audience. By engaging with local communities, national and international museums and broadcasters SASE has developed new public audiences for contemporary and historical screen culture that have generated over £1.8m in income, with total audiences exceeding 25 million.

The past decade has seen a revolutionary change in how film archives operate with the arrival of the internet. “Being part of a networked world has transformed every aspect of our work,” said Dr Gray. “When the archive was established in 1992, if you wanted to see our films you physically came to where we were. An AHRC grant helped us build a digital catalogue and present some of our content online, which was a fundamentally important step: sharing our collection online means that serendipitous things happen.”
One interesting example is a film-maker from Germany who came to live in England in the late 1930s but who returned to Germany after the war. The Dresden International Short Film Festival presented a retrospective of Peter Sachs’ work and the web catalogue provided the vital link. “It turns out that one of his very earliest films was created for a tinned meat and fish firm in Chichester, and without our online presence the creators of the retrospective would never have come across this unique film.”

The link with higher education is critical for a film archive’s core research and pedagogical function. As an art and film historian, Dr Gray is constantly focused on the many and varied histories contained in the archive. “Each film represents so many things and since the vast majority of our films are non-fiction, they are intimately engaged with aspects of everyday life, and of commemoration, so they’re the perfect complement to other archival sources such as paper archives, oral histories and even archaeology.”

The role of the archive is multi-faceted and inspirational, as well as representing solid intellectual and academic capital. “We’re opening doors to different histories and making connections,” said Dr Gray. “We’re making people inquisitive about their past, we’re articulating history through the moving image, and we’re providing a resource for teaching and research, for museums and for artists.”

Frank Gray’s public activities through his leadership of Screen Archive South East and Cinecity have brought film alive to the city of Brighton and Hove and have been a driver for the city’s ongoing success in all aspects of the film cluster. Frank has nurtured a public/private sector partnership that was successful in making Brighton and Hove the centre for the audience development of cultural cinema in the South East.

Donna Close, Head of Arts, Royal Pavilion, Arts & Museum
Dr Megha Rajguru is a member of the Remaking Picasso’s Guernica collective, formed in 2012 to remake the iconic Guernica as a textile protest banner. The banner-makers have reinterpreted Picasso's famous shapes as a method of reflecting upon and protesting against recent wars and loss of life. The shapes made by the collective have been sewn onto the banner, in affiliation with public institutions, by hundreds of people in public places from Manchester to Ahmedabad.

Dr Rajguru and her colleague Dr Nicola Ashmore have, as early career researchers, worked alongside historian Dr Louise Purbrick, whose experience working in community projects in post-conflict societies, particularly Belfast, have guided the Remaking Picasso’s Guernica project from its inception. Dr Purbrick’s own scholarship brings an understanding of how gallery spaces are used for political debate, and the recognition of art as practice and process rather than being motivated only by the display of finished objects.

Dr Rajguru’s work investigates intervention projects that revisit works of art framed by art history and reinterprets them to construct new meanings. Through the process of collective making in public spaces using craft methods, the Guernica remaking subverts the iconic painting made by a singular male artist in his studio. It is unsigned and does not claim mastery over sewing techniques. It instead chooses to focus on the universal meanings embodied in the shapes in Guernica, and establishes the stitch as a suitable medium that is also universal, and translates these meanings through the collective making process. Dr Ashmore worked closely with activists on the production of the central figure of the textile piece, the horse, and is developing analysis of other collective recreations of Picasso’s work.

Working collectively has created a dialogue that involves an exchange of people’s experiences of sewing, of art, activism, anti-fascism and aerial bombardments of civilian populations. This important dialogue has continued through public sewings involving hundreds of people, recorded in the stitches that hold the banner together.

To reveal these links in the context of protest art, Dr Rajguru has developed a curatorial link with the Pallant House Gallery, Chichester, instigating two public sewings and contributing the Guernica banner for display.

Photograph: Emilia Poisson.
The Victoria and Albert Museum is the world’s greatest museum of art and design, and for nearly 20 years researchers from the University of Brighton have helped transform the Museum’s role in shaping contemporary design cultures.

Design influences our world at every turn, from the products we buy to the way we interact with our public services and, increasingly, to the way we use digital tools to obtain information online.

“For much of the twentieth century, museum collection and acquisition policies were about the beauty of the object and its function in documenting changing tastes,” said Professor Guy Julier, the University of Brighton Principal Research Fellow in Contemporary Design at the Victoria and Albert Museum (V&A). “More recently, we’ve been thinking in deeper ways about the role of the object, and that has had a clear impact on the role of the curator. We want to tell stories using objects, not simply present the object itself.”

Professor Julier’s predecessor as Research Fellow, Professor Jane Pavitt, played a key role in developing methods of curation and using research and scholarship to provide context and communicate social and cultural meanings to broader audiences. Professor Pavitt drew a number of important conclusions that impacted on all aspects of curation and acquisition policies. Outcomes focused on rigorous object scholarship and included the curation of a number of important V&A exhibitions, as well as other initiatives to develop younger professional audiences and connect with the creative industries. These collaborations continue to grow via initiatives like the Design Culture Salons hosted by the V&A, which bring together academics, critics and practitioners to discuss key contemporary design issues.
The University of Brighton’s research has helped to transform Museum approaches to acquisitions and promoted wider public understanding of post-war design in the twentieth and twenty-first centuries. Researcher involvement in V&A exhibitions has created new engagement with design from specific periods and has progressed practical understanding of design and its cultural impact as well as prompting public dialogue and debate. In particular, these collaborations have had a positive impact on how different Museum departments work together and how the V&A as a whole works with universities.

The V&A puts research at the interface with public display, reception and education. This is in keeping with the ambitions of a new university culture and encourages a highly productive relationship. “Research asks critical questions,” said Professor Julier. “It can ask deeper questions dealing with the complexities of modern life. Museums are fundamentally important as places where the public are provoked to think about their world.” These questions emerge across the V&A’s activities, such as the Museum’s own Rapid Response Collecting strategy, which looks beyond the ‘intrinsic’ qualities of an object to its social, economic and political impact. For example, a newly acquired pair of Primark cargo trousers manufactured in Bangladesh, becomes in the wake of the Rana Plaza factory collapse a symbol around which people can debate issues of globalisation, the fashion industry, consumerism and the environment. The potential of objects such as these to provoke reflection and discussion remains a key focus of the Brighton-V&A research collaboration.

Museums also play an inspirational role for students and practitioners, and the relationship between them and higher education organisations is long-standing and important. “Higher education today is structurally looser than it was,” said Professor Julier, “with many different modes of learning including online and blended approaches.”

“Museums are reacting to this new landscape in lots of positive ways and universities feed back into museums too. I supervise a range of PhD students who use the V&A as a central resource, and their research contributes to the ongoing impact.”

Brighton’s contribution has changed the landscape in an important area of museum work and will have an impact for years to come.

David Anderson, former V&A Director of Learning and Interpretation, now Director General of National Museum Wales

“PARTNERS IN CURATION

“
Changing culture through photography

Drawing on their international reputation in photography, the university’s researchers have changed the way images can be used to help us engage with our history and identity. From playing a key role in reconciling divided communities to creating the way public projects such as the Millennium Dome are recorded and displayed, these innovative practices have demonstrated the cultural impact the medium can have.

Professor Mark Power, a member of the prestigious, international Magnum group, said: “For me, photography has real legitimacy as a medium of critical artistic significance within the wider cultural economy and public sphere.” His projects, in which large-format camera work produces astonishing effects of light and line, have given new interpretative context to a number of popular national icons and local people, including the BBC’s Shipping Forecast, the varied people within his Black Country Stories, and the documentation of construction projects such as the Millenium Dome and the Airbus A380, the largest plane ever built.

Emma Chetcuti, the Director of Multistory, has stated: “Mark’s work has made an impact, in particular, on the local people who took part in the project and who came to see the work at The New Art Gallery Walsall, with the work affording them the opportunity to imagine themselves and where they came from differently.”

Through such projects, photography at the University of Brighton captures the changing nature, regeneration and transformation of places, playing a part in the making of history and heritage, while developing the way art is used to understand public memory. Drawing together historical and practice-based approaches, Dr Louise Purbrick works alongside photographer and university colleague Xavier Ribas on the AHRC-funded Traces of Nitrate project, which visualises the land, cityscapes and material histories of nitrate mining in Britain and Chile, exploring the legacies of British colonial intervention, and how material culture holds the past in the present.

The project has produced an exhibition in collaboration with international partners and a prestigious international contemporary art venue, the MACBA-Museo d’Art Contemporani de Barcelona. The exhibition will tour to another two major venues in the UK and Spain.

Fellow photographer Julia Winckler, oscillating deliberately between photographic and archival research, has developed photography as a medium through which collective memories can be reconstructed and given a renewed cultural presence. Her research communicates the capacity of photographs to unearth both personal and cultural memories and to support processes of remembrance. Winckler’s Traces exhibition at the Austrian Cultural Forum brought important responses from the Association of Jewish Refugees, acknowledging that her work made “the private public, the individual universal, transforming the most humble photographs into images so utterly powerful.”

The exhibition also led to her appearance on Tikun Spectrum Jewish radio, which offered insights into how creative photographic practices can help overcome the trauma of disappearance associated with the Holocaust. The engagement of the public with photography of this kind was described in a review: “Robert Lowell said, ‘A poem is an event … not the record of an event.’ This show is an event because it enables the viewer to re-realise loss and discovery, absence and presence” (Clare Best, The London Magazine, May 2012).

The reputation developed by its major practitioners and theorists allows the university to play a key role in the engagement of audiences with photography. Forming and supporting exhibitions and publications, including the Brighton Photo Biennial, the university has encouraged and contributed to critical debate around the changing uses and increasing cultural prominence of the medium, whether this is in the methods of visual storytelling that develop identity, or in the cultural position of photography in the public sense of heritage.
“Our research has helped to enrich the public imagination with the recognition of photography as new cultural capital,” said Professor Power. “We’ve succeeded in deepening cultural experiences and insights for audiences, and we’ve strengthened the place of photography within the creative economy, helping to build and sustain audiences.”

Robert Lowell said, ‘A poem is an event ... not the record of an event.’ This show is an event because it enables the viewer to re-realise loss and discovery, absence and presence.

Photograph: Conall Gleeson performs a musical interaction with the sound-object, Large and Small by German artist, Peter Vogel. Presented in the Exhibition Sounding out the Museum, at the University of Brighton, curated by Conall Gleeson and Jean Martin.
Towards new ways of listening

Researchers at the University of Brighton are challenging the ways we engage with sound and reflect on the value of music in our lives. The impact can be heard across a wide range of scholarly activities, from the use of sound to empower marginalised communities, to the exhibition of sound in gallery spaces, to the understanding of cosmological theories.

“Audiences act as co-producers in the making and understanding of an artwork,” said Conall Gleeson, researcher in performance, sound and music. “They perform an active role in constructing the experience of listening and making sound.”

He continued, “The mobility of audiences, within the context of a gallery, offers the contemporary sound artist a range of challenges that differ from that of the concert-hall composer. Historically, music for seated listeners focused on the temporal sequence of sound. The presentation of sound in galleries, however, tends to allow for the free and open movement of sound and the flexible movement of audiences. Audiences in turn orientate their experience of artworks according to their interests and preferences.”

The idea of an open and fluid co-production of experience and meaning allows for a strong and purposeful exchange of ideas, histories and cultures between audiences, artist and artwork.

Dr Mikhail Karikis explores the experience of communities through the sounds and music that inhabit their everyday lives. He recently worked with the last generation of female sea-workers living on the South Korean island of Jeju. Drawing upon the sounds of breath and the songs of their work Dr Karikis developed an installation that framed the lives and industry of the sea-workers within the context of questions concerning the anthropological and the global economy.

Professor of Sculpture, Charlie Hooker, develops installations, audio-works and sculptures that produce sound from invisible elements of the natural world, creating works such as Timeline, an audio installation triggered by cosmic ray activity. Through recent links with the Brighton Centre for Regenerative Medicine, he is now creating a new interactive immersive audio-visual environment triggered ’live’ by cell and tissue growth as it develops in petri dishes in a controlled laboratory environment.

Gleeson’s own work questions the relationship between composer, performer and audience through experimental practice, whilst encouraging a more mindful understanding of the way sound influences our emotional and intellectual lives.

He has utilised the apparatus of the seventeenth science laboratory to make music. His Bell Jar Orchestra consists of a series of bell jars; inside of which, is an automated hammer that repeatedly strikes a small bell. The volume of sound is controlled not by the how hard the hammer strikes the bell, but by varying the air pressure inside of each bell jar.

When a vacuum, there is no sound. When full of air, the sound is at its loudest. The work recontextualises the intellectual heritage of the seventeenth-century scientific enlightenment, and aestheticises the scientific methodologies, apparatus and laws that stem from this period.

“Constantly innovative in its use of technologies, both traditional and emerging, and far-reaching in its materials and processes, Hooker’s work simultaneously embraces and questions new scientific and artistic knowledge, not for its own sake alone, but primarily to communicate his working of this material with an audience.”

Dr Kevin Atherton, Head of Postgraduate Pathways, National College of Art and Design, Ireland
The future storyteller

Stories are how we define our identities and describe our past; they are the way we talk about our family relationships and about our place in the world. Fundamentally, our recognition of self and society depend upon how we tell each other stories. Today, researchers from a range of disciplines across the University of Brighton are building insights and understanding about the place of storytelling in our information-rich world.

Storytelling is one of the oldest ways of communicating. Before written history, oral tradition helped people to create identity and understand society. Today, storytelling is being used to explore relationships between cultures and across continents.

Professor Paul Sermon is working on an AHRC-funded project to link central Delhi and London as part of India’s UnBox Festival. Alongside seven other UK researchers, Professor Sermon’s research examines the particular challenges relevant to today’s society, as it aims to reimagine the role of citizens and to consider the implications of this for the management of services and infrastructures within future cities.

The digital revolution is coming quickly to India, and one of the project’s aims is to leave a legacy for people in Delhi which presents a distinct, narrative-driven approach to technology rather than a conventional social media experience.

“We’ve looked for analogies for the impact we’re trying to create and one is San Francisco in the 1970s,” said Professor Sermon. “Computer networks were just beginning to emerge and were an experimental medium in shaping the artistic community, creating links between artists in different places and across disciplines. There’s a very clear sense that technology had a big influence on art and on society in California and that’s part of our ambition today.”

“People have been moved from so-called slum areas into new government-agreed settlement zones,” said Professor Sermon. “They’re allocated plots measuring three by four metres for new homes and we’ll be using the same sized spaces to create two cubes, one in London and one in Delhi, which we can merge into the same video space, connecting two worlds and creating a space where people can have playful but meaningful experiences, controlling technology not through a keyboard and mouse but using their bodies to help inform this process of becoming an engaged and responsible citizen.”

The project will also examine how ephemeral and un-rehearsed stories can be captured, creating a documentary archive where participants record their experiences and build a picture of responses which can be preserved for the future, becoming an ever more valuable ‘snapshot’ record over time. The project’s outcomes are of relevance not just to India, but to other countries around the globe, as the UN estimates that by 2050, 70 per cent of the world’s population will live in cities and the burden on public services will increase.

Stories can have psychological benefits too. Mark Dunford leads the Silver Stories research partnership, which uses digital storytelling to gather stories from older people across six countries and tests the use of the digital storytelling methodology as a pedagogical tool to train healthcare professionals working with older people. Digital Storytelling is a collaborative process which enables people to tell their stories, in their own voices using still and moving images and voice-over soundtracks. The workshops enable disenfranchised and vulnerable groups to represent themselves and re-associate with particular episodes in their lives, at the same time joining with a collective, community history.

Stories can also be told through installation art, and Professor Matthew Cornford, as one half of the partnership Cornford & Cross, has created a body of work that builds new understanding of human histories. It Happened Here (2010) involved the removal of the formal courtyard garden in The Commandery museum in Worcester, the site of the defining battle of the English Civil War in 1651, replacing it with turf specially transported from County Derry/Londonderry in Ulster. The installation of a lawn, a key convention of an English garden, acts as a war memorial and reminder of a traumatic historical narrative. It Happened Here continues Cornford & Cross’s commitment to making site-specific installations that create new stories about historic conflicts, such as the narrative explored in Words are not Enough (2007), a temporary peace garden positioned over an abandoned Cold War era nuclear bunker.
Photograph: 3x4 pilot project installation at UnBox LABS Ahmedabad in India, February 2014, Paul Sermon.
We live digital lives and researchers at the University of Brighton are helping to make those lives richer, exploiting the best of what the online world has to offer through an intricate set of insights into the world of film.

Thanks to internet search engines, we are accustomed to instant, simple and useable data interrogation; our expectations are high yet the traditional world of film archiving is entrenched in an old-fashioned ‘filing cabinet’ approach to data management.

“Archive materials that do exist are usually only searchable by the descriptive data that a cataloguer has created,” said Dr Sarah Atkinson, from the university’s College of Arts and Humanities. “There can be lots of interesting and valuable data on locations, buildings, young actors and directors, all sorts of things that might not be added to an archive. For example, it would be really interesting for an architect to be able to search for ‘St Paul’s Cathedral’ and see all the instances when St Paul’s has featured on film with adjacent buildings that have since been demolished.”

Cultural historians, film studies academics and people from many other disciplines will benefit from being able to access all information about a film. Currently, what little data is available is in multiple locations and has no links. The vision for Brighton’s AHRC-funded DEEP FILM Access Project is to allow the viewer to pause a film and explore every aspect of how it was made, from the cast and crew, to the camera lens that was used for a specific shot, to the special effects added in post-production.

Project partners include the BBC, the BFI and Screen Archive South East and Dr Atkinson is working with director Sally Potter’s 2012 film Ginger & Rosa. The project addresses the complexity of different data types, from scripts and emails between directors and producers, to budget information, shooting schedules, even Polaroid photographs taken for continuity.

A key outcome of this project will be a data integration model, developed in collaboration with Dr Roger Evans, a computer scientist from the university’s School of Computing, Engineering and Mathematics. This model will be created in conjunction with visual media experts, filmmakers and archive curation specialists, and will be supported by a new framework of standards for recording data during the production of films. The long-term aim is to create opportunities for filmmakers to consider the data assets alongside the visual assets.

Central to the research is the creation of a new language, one to describe the various aspects of data so that they can be organised and searched, and one that will apply equally well to TV. The BBC Archive Development team is currently working on an innovative approach to create a searchable database of subtitles which can link to archived TV schedules to identify specific footage. The learning from this will feed into the ongoing research underway through the DEEP FILM Access Project.

Digital audiences are continually evolving, finding new ways of engaging with content, and the film and TV industries are struggling to keep up with developments. “There’s a commercial imperative for the film industry to get on board,” said Dr Atkinson. “Making of content is massively popular, but the notion of physically purchasing a film on DVD or Blu-Ray is in decline with the rise of on-demand content. Studios need to monetise their ‘behind the scenes’ content and our approach, which aims to enable more interactive access, could be commercially very attractive.”

Photograph: Adventure Pictures
The University of Brighton’s pioneering work in the history of design has changed the way design is taught and the way it is viewed.

Professor Cheryl Buckley, editor of the *Journal of Design History*, the leading journal in this field, moved to the University of Brighton at the end of 2013 because of its “huge impact on the history of design as a national and international discipline.” “There is no other comparable institution,” she said. “Brighton put the history of design on the map, and through its undergraduate and postgraduate work has helped to build capacity in a subject that underpins and reinforces the central position that design has occupied in post-war Britain.”

Research carried out at the university has influenced the form and content of design courses around the world. For instance, the work by Professors Lou Taylor, Jonathan Woodham and Guy Julier has contributed significantly to the expansion of design and dress history as a field of study since the 1990s at both undergraduate and postgraduate level, with their work becoming one of the mainstays of reading lists around the globe. Research by Dr Louise Purbrick on material culture of the everyday, Dr Paul Jobling on graphic design, fashion and masculinities, and Professor Catherine Moriarty on design curation, has further extended the range and reach of history of design at the university.

But it is not only in the academic sphere that the University of Brighton’s work on the history of design has had a significant impact. It has filtered through to the general public through collaborations with a variety of organisations and institutions including museums across the world. The unique archives the university houses, such as those of the International Council of Societies of Industrial Design, the International Council of Graphic Design Associations and the Design Council Archive, provide invaluable research connections to the design professions.

The latter came to Brighton in 1994 as a result of the research on design and the state conducted by Professor Woodham. His book, *Twentieth Century Design*, Professor Julier’s *The Culture of Design* and Professor Taylor’s *The

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*Study of Dress History* pioneered the redefinition and representation of disciplinary territories, championed the archive, introduced concepts of mapping and design networks internationally, and, in so doing, embraced academics, publics, design practitioners and museum curators.

The recent arrival of Professor Buckley and Professor Jeremy Aynsley adds to the university’s standing as a centre for design historical scholarship. Professor Buckley’s work, which has impacted upon museum curation and design curricula, embraces fashion, ceramics and gender, and focuses mainly on Britain and the United States. Professor Aynsley’s research on modernism in graphics and on design...
The quality of Brighton’s collections and the excellence of its stewardship of these were important benchmarks for how we would establish and maintain our archives at RMIT. Further to this, the impact Brighton has had on the design professions, particularly in their understanding of how design is produced, marketed and consumed were important considerations for RMIT’s operations.

Professor Harriet Edquist, Director, RMIT Design Archives, Melbourne, Australia
How do you create sustainable urban living? University of Brighton researchers have developed high-profile ways to promote sustainable living, which have captured the imagination of both their peers and the public.

The University of Brighton’s Waste House has become a platform for promoting sustainable design. The project originated in 2008 when Duncan Baker-Brown, an architect and Senior Lecturer at the university, took part in a TV documentary challenge to build Europe’s first prefabricated house out of compostable materials. The six-day build was filmed live and broadcast at the end of each day on the Channel 4 programme The House that Kevin Built, part of Grand Designs Live.

In 2012, Baker-Brown decided to redesign and rebuild the house using waste and surplus material in response to the fact that the equivalent of one house of waste goes into landfill for every five houses we build. One of the main aims of the project was to prove “that there is no such thing as waste, just stuff in the wrong place.” During a major fundraising campaign, The Mears Group, a local construction company with a national portfolio, offered to underwrite the whole house, ensuring the site was safe and with other key partners, including Cat Fletcher from FREEGLE UK, the real potential of waste as a valuable resource was reinforced.

The building was the first A* rated house for energy performance, as well as the first prefabricated dwelling constructed with replenishable and compostable materials. It was later dismantled and its components were used in new builds around the UK.

Through Mears the project was connected to City College Brighton and Hove, and as part of the college’s annual building project 70 students worked on the Waste House in their workshops and over 250 students helped in total including those on site. Brighton & Hove City Council has since incorporated Baker-Brown’s research on eco-retrofitting and waste minimisation into its award-winning sustainable planning policy. The Waste House is also a case study supporting Brighton & Hove City Council’s One Planet Living Action Plan the first of its kind in UK.

The house, which stands on the University of Brighton site at Grand Parade, is open to the public and offers an educational space as a new design tool. The house includes peepholes where you can see the materials used in its construction, including 20,000 toothbrushes, two tonnes of denim jeans, 4,000 DVD cases, 2,000 floppy discs, 2,000 used carpet tiles (used
In 2005 Professor McEvoy founded the spin-off company Dwell Vent, which tested and refined the design innovations with partners in Denmark, Ireland and Poland through a €278,000 EU Intelligent Energy Europe Programme grant.

Since 2010, Professor McEvoy has led a €6.3m EU Interreg IVA project, Innovation for Renewal (IFORE), in partnership with two large-scale housing associations, to adapt the award-winning ventilation system to 200 social housing units in the UK and France as part of wide-ranging investigation into retrofit technology. The project has led to a saving of over 40% a year on heating bills for residents who have been engaged in working towards the re-branding of their communities.

Viljoen and Bohn’s highly regarded research conducted worldwide over a period of 10 years shows how urban space can be redesigned to incorporate food growing. Published in the influential book *Continuous Productive Urban Landscapes: Designing Urban Agriculture for Sustainable Cities*, and its recent sequel, *Second Nature Urban Agriculture: Designing Productive Cities*, their research has influenced policymakers in London, Rosario, Burkina Faso, Almere, Berlin and Middlesborough. In Middlesborough, the researchers’ participation in a Design Council project led to the development of 17 new allotment sites, the establishment of an annual town meal which feeds over 2,500 local residents with locally grown food, and the use of school-grown food in over 30 local schools. Their research has been debated at venues including the 2012 Venice Biennale and examples of its practical implementation have been cited by the United Nations University Institute for the Advanced Study of Sustainability as model examples for delivering urban sustainability.

The Waste House is one of three interconnected projects which have generated new design thinking and innovation around sustainable urban living. It stands alongside Professor Mike McEvoy and Dr Ryan Southall’s work on passive ventilation systems, and Andre Viljoen and Katrin Bohn’s research into urban agriculture. Professor McEvoy and Dr Southall’s whole house ventilation system incorporating heat reclamation without the use of electricity has been the subject of research grants funded by the European Union and the Carbon Trust.

The City Council has drawn considerable inspiration and valuable guidance from working with Duncan and his work has advanced policy and practice for sustainable design across the city. His contributions have influenced a considerable number of development schemes in the city which now has one of the finest portfolios of sustainable buildings of any UK town or city.

Martin Randall, Head of City Planning & Development
Brighton & Hove City Council
University of Brighton

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Visit the Research webpages for digital materials from this publication: www.brighton.ac.uk/research
In 2008 the University of Brighton produced a publication, *Transforming Research*, which set out the quality and breadth of research taking place across the institution. Since then, the university has maintained its position as a sector leader in research and community engagement. The university continues in its commitment to generate, transmit and share knowledge, with a focus on the application of that information in society and its environment. This publication, *Making Research Matter*, represents the next stage of our development, with the aim to be a university whose research changes lives, economies and the experiences of people for the better.