UWE Bristol Student Conference 2018

26 March 2018

Exhibition & Conference Centre

University of the West of England, Bristol

#UWESC18

UWE Bristol | University of the West of England

Welcome to the UWE Bristol Student Conference

Dear Colleagues,

The Conference Steering Group, and all the individuals who have contributed to the development of the second UWE Bristol Student Conference, extend a very warm welcome to you. We hope that you will experience a lively and stimulating conference.

Organised jointly by staff and students, the UWE Bristol Student Conference celebrates research/enquiry/evidence-based practice from undergraduate and postgraduate taught students across all years of study and all disciplines. We have a busy conference timetable but you can plan your day by referring to the verbal paper and poster schedules over the early pages of this programme and the index of presenters at the rear. We have allowed plenty of opportunity to share knowledge and ideas about research across many disciplines. We hope you take full advantage of these opportunities and are enthused to be part of our inclusive community of academic practice.

Every student presenting their research/inquiry here today has risen to a great challenge. They have become 'true researchers', subjecting the knowledge and understanding they have acquired to public scrutiny. They have recognised that a significant impact on learning comes not only from within the classroom but from boundary-crossing, integrative and socially interactive experiences that bridge the classroom with life beyond it. In this public conference space, presenting their research to a diverse audience, our students are casting off the fixed identity of 'student' to become emerging research professionals.

A key priority for us at UWE, Bristol is to prepare our graduates to be ready and able to realise their full potential, well equipped to make a positive contribution to society and their chosen field of work or further study, and primed to play their part in developing a sustainable global society and knowledge economy (UWE Bristol Strategy 2020). We are mindful of Aristotle's thoughts about excellent practice:

"Excellence is never an accident. It is always the result of high intention, sincere effort, and intelligent execution; it represents the wise choice of many alternatives - choice, not chance, determines your destiny"

The excellence you will see here from our conference presenters is indeed no accident. It follows their conscious decision to be engaged, research-active and productive members of the university. All the presenters are taking a bold step today, shaping their future and determining their destiny in a competitive global environment by building knowledge, experience and capabilities that add great value to their taught degree studies.

Jennifer Hill & Harry West
Conference Convenors
(for the Academic Practice Directorate)

UWE Bristol Student Conference Steering Group

Conference Convenors

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Academic Practice Directorate
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We would also like to thank all of the UWE staff judges and session chairs.

Keynote Presentation

Professor Iain Stewart

University of Plymouth

Iain is Professor of Geoscience Communication at Plymouth University and Director of its Sustainable Earth Institute. His long-standing research interests are in interdisciplinary investigations of geological hazards (earthquakes, volcanism, tsunamis) and abrupt environmental change.

Alongside his academic research, for the last 15 years Iain has worked closely with BBC Science to host a number of major television documentaries on the nature, history and state of the planet. These landmark series include 'Earth: The Power of the Planet', 'Earth: The Climate Wars', 'How Earth Made Us', 'How To Grow A Planet', 'Volcano Live', 'Rise of the Continents' and 'Planet Oil'. Iain regularly fronts special BBC documentary features on topical geoscientific issues, notably the 2011 Japanese earthquake, the Russian meteor strike and Florida sinkholes.

This popular geoscience output has gained international endorsement, receiving honours from many learned societies. Additionally, Iain has been elected as a Fellow of the Royal Society of Edinburgh (2017) and he was awarded an MBE in 2013. He served for 7 years as Theme Leader for Geo-Hazards on the Scientific Committee of the UNESCO International Geological Programme, and has been recently approved as a UNESCO Chair in Geoscience and Society.

Now at the helm of Plymouth's Sustainable Earth Institute, Iain is currently developing an interdisciplinary research programme, working with social scientists and media professionals to communicate contested geoscience – geo-energy, climate change, natural hazards – to public audiences.

Between a rock and a hard place: communicating contested science to public audiences

Scientific knowledge and understanding lie at the heart of many of the most critical societal issues that face us in the 21st century. Yet whether it is climate change or fracking for shale gas, communicating these complex issues to the lay public is fraught with difficulty. Whilst scientists in academia and industry are increasingly being encouraged to convey more broadly what they do and what they know, public responses to science and technology are as much about values and aesthetics as they are about factual information and technical understanding. Using the experience of popularising science for mainstream television, this talk will explore ways in which scientists can make our research connect better with the dissonant public, and in doing so forge more effective strategies for meaningful public engagement.

Conference Programme

Time	Programme	Location
10:30	**Conference Registration**	ECC Zone E
11:00	**Welcome** **Keynote (Professor Iain Stewart, University of Plymouth)**	Lecture Theatre
12:00	**Paper Session A** Stream 1 Stream 2 Stream 3 Stream 4 Stream 5 Stream 6 Stream 7	 Severn Thames Lecture Theatre Frome Arno Isere Danube
13:15	**Poster Discussions* & Lunch**	ECC Zone D
14:45	**Paper Session B** Stream 8 Stream 9 Stream 10 Stream 11 Stream 12 Stream 13	 Severn Thames Lecture Theatre Frome Arno Isere
16:00	**Closing Plenary & Prize Giving**	Lecture Theatre

** Posters will be displayed over the duration of the conference, but time is allocated for students to stand by their posters and answer questions (13.15-14.40)*

Programme – Verbal Paper Session A (12:00)

Stream	Author(s)	Title
Stream 1 (Severn)	Estelle Murer	The potential impact of Brexit on hotel investment in the UK
	Cuong Ngo & Gabrielle Wheway	Using CRISPR/Cas9 to investigate the causes of inherited blindness
	Tayo Lewin-Turner	The lie of benevolence: the white-washing of abolition and the de-radicalisation of black history
	Rafael Heeb	Designing a flexible matrix composite morphing skin for plane wings
Stream 2 (Thames)	Stephanie Morris	Developing peer-led student supervision in practice: an evaluation
	Bryan Kneis	3D face recognition for biometric access control
	Chris Grundy	A qualitative review of the perception of the concept of the 'friend zone' amongst millennials
	Stephanie Udoh	Effect of conventional versus non-conventional treatment on *C. albicans*
Stream 3 (Lecture T)	Amer Hijazi	Integration of Building Information Modelling (BIM) with Internet of Things (IoT) Data Analytics (DA) to enable smart city development
	Oliver Wilkinson	A system for automated visualisation creation and recommendation based on fusion and analysis of multi-variate data
	Brodie Walker	Evaluating the communication of Ebola Virus Disease in Sub-Saharan Africa from 2013-2017

	Nayomi Illansinhage Don	The electrochemical behaviour of 2,4-dinitrotoluene and its determination in vapour as a possible sensor for explosives and their residues
Stream 4 (Frome)	Jake Rowe	Machine vision-based fall detection by the elderly using deep neural networks
	My Nguyen	Assessing compliance of Vietnamese laws with WTO's Trade Facilitation Agreement (TFA)
	Iraje Nadeem Ahmed, Stuart Gibbs , Yizhu Wen & Lauren Easterbrook	Transforming the VCSL Programme into the UWE Exceptional Leadership Programme - A Proposal
	Bob Clawley	The lost leisure occupations of adults with Chronic Fatigue Syndrome/Myalgic Encephalomyelitis (CFS/ME)
Stream 5 (Arno)	Lauren Orchard	A student paramedic's journey towards breaking communication barriers in pre-hospital settings
	Sophie Tatum	A reflection on a 'reading for pleasure' session in a Year 5 class within a 'reading for pleasure' school
	Dominika Benton	Torture as a tool of counter-terrorism: the question of effectiveness
	Megan McKnight	Fingermark development on thermal paper using Vacuum Metal Deposition (VMD)
Stream 6 (Isere)	Saluuga Hasan	United Nations Convention on the Law of the Sea: has it been adequate in dealing with piracy in the case of Somalia?
	Siobhan Fairgreaves	Motivations of primary school teachers and creative practitioners engaging with a collaboration between science and dance. Case Study: The Flying Atoms

	Michael Henderson	Immigration to Britain: lies, liabilities and lessons learned
	William Armstrong	Could measuring exhaled carbon dioxide address a proposed misclassification bias within out-of-hospital cardiac arrest research?
Stream 7 (Danube)	Rachel Davies	Creating a security culture in Higher Education Institutions
	Emma Harvey	Transnational eugenics in the inter-war years
	Rose Vincent	A multi-perspective evaluation of the 'Active Together for Dementia' partnership project
	Alan Mills	Malware detection and analysis using machine learning

Programme – Poster Discussions (13:15)

Poster	Author(s)	Title
1	Leila McGarel Groves	How effective are socially inclusive day centres in promoting recovery for those with lived experiences of mental ill health?
2	Brandon Robertson	Investigating the optimum lift to drag ratio for an aircraft wing experiencing 'ground effect'
3	Paul Robinson	A spectral and spatial comparison for assessing burn intensity as a result of the June 2017 Knysna Forest fire disaster using Landsat 8 and Sentinel-2 satellites
4	Tanzida Haque & Caroline Flurey	Measuring the mental well-being of international students at the University of the West of England, Bristol

5	Mia Wreford	The effects of mercury pollution associated with artisanal and small-scale gold mining on the environment and local community of Bukuya, Mubende, Uganda
6	Luke Bland	Design and comparison of Vertical Axis Wind Turbine (VAWT) systems for modern homes in the UK
7	Amy Taylor, Josh Steven & Elizabeth Anderson	Rapid in-vitro testing and characterisation of resistance to chemotherapy in Acute Myeloid Leukaemia
8	Imogen Pengelly	Factors that affect people's attitudes towards prison and punishment
9	Saqib Ahmed	What effect has the introduction of gorilla infants in captivity had on the associations and interactions of the rest of the band?
10	Abigail Oyelayo	The role of hBCAT enzymes in the pathology of Alzheimer's disease
11	Morwenna Masters	An investigation into the effect of land use on river channel water quality in South West England
12	Charlotte Rawlinson	Reflecting upon creativity in the context of a South African primary classroom
13	Rebecca Carter & George Redrup	How does treatment with chemotherapeutics compare to branched-chain amino acid restriction in leukaemic cell lines?
14	Adam Langford	Getting young people involved in land cover monitoring: a case study with mobile applications in Greece
15	Connor Best	User-oriented email threat analysis
16	Nadine McDougall	An investigation into downstream changes in channel form for British rivers

17	Maija Kolomainen	Valentina Tereshkova and the Space Race
18	Bethany Watkins	The effect of bait and biogeographical variables on the abundance and diversity of butterflies in a historically disturbed Neotropical forest
19	Ilaria Zanetti	What is that swimming in my pool? Using DNA traces to identify and monitor West Indian Manatee (*Trichechus manatus*)
20	Thomas Haines, James Longhurst & Sam Bonnett	A baseline assessment of the UN Sustainable Development Goals within European Student Union web environments
21	Joseph Leslie	Ex situ conservation of the pancake tortoise (*Malacochersus tornieri*)
22	Nikki Green	The effect of lemongrass essential oil on the gene expression of planktonic and biofilm *Staphylococcus aureus* and *Acinetobacter baumannii*
23	Cameron Smith	Understanding, attitudes and awareness towards mild traumatic brain injury and its associated long-term effects within rugby union
24	Aara Mokhtary	Is students' fear of crime heightened as a result of the presence of different types of graffiti within Bristol?
25	Anthony Manyara	Coverage and inequalities in HIV and cancer promotion and prevention indicators among women in Kenya: A secondary analysis of Demographic Health Surveys
26	Rosie Wibberley	Visitor educational experiences at Buckfastleigh Otter Sanctuary
27	Samantha Osmond	Development of a quantitative liquid chromatography tandem mass spectrometry method to determine time since last cannabis use from human urine samples
28	Charlotte Carroll	Does hierarchy influence allo-grooming in captive ring-tailed Lemurs (*Lemur catta*)?

29	Annette Price	An Investigation into the influence of heritage tourism on the monuments at Petra, Jordan
30	Benjamin Lewis	A gravity compensation exoskeleton for patients with upper limb impairments
31	Anne Rowbottom	Why do people engage in regular sea swimming? A qualitative research study
32	Aruezi Osue	Isolation and characterisation of a novel bacteriophage
33	Amera Shankla	Handedness and insight problem solving
34	Jacob French, Julianna Muñoz, Maria Lear, Rami Ismail, Sofya Kipnis & Zaneta Kresinska	Spatial distribution of cocoa: an indicator of an inequitable global economy
35	Emma Bennett	Habitat preference, distribution modelling and threat analysis of the Visayan warty pig (*Sus cebifrons*) on the island of Negros, Philippines
36	Gus Levinson	Inhibition and motivation as predictors of performance on two different modalities of the Tower of London task
37	Robert Adams	The impact of internal and external edge effects on temperate deciduous forest microclimate and species diversity
38	John Barker	Graduate enterprise routes: venturing into the Business Model Canvas
39	Megan Richardson	Identifying genes involved in the colonization of plants by bacterial plant pathogen *Pseudomonas syringae* pv. *pisi*
40	Uzoma Uzochukwu	Expression of carbonic anhydrase IX and hypoxia induced factor - 1α in breast cancer and its comparison with fatty acid binding protein-7 biomarker

41	Tiffany Cordier	Measuring the cytotoxic and genotoxic effects of Carmustine and Melphalan on cell line TK6
42	Bertie Scott	Evaluating predictive measures of language dominance in epilepsy patient data
43	Shenikh Qadir	A comparison of the antibacterial effects of five essential oils against two species of bacteria
44	Laura Bratley	An investigation into school readiness: a year one perspective
45	Callum Lance Foster	Monitoring the impact of local water management practices from space
46	Charlee Humphries	The effects of flavoured chewing gum on cognitive function and mood
47	Marya Shnoudi	Syria: the destruction of ancient architecture and the loss of the nation's identity
48	Sionedd Lee	The epidemiology of diagnosing cervical cancer and the importance of early detection through cervical screening
49	Freya Sinclair	A critical analysis of law and morality
50	Katy Butt	Did institutions of East Germany between 1945 and 1960 use a construction of the Nazi past to indoctrinate children into becoming 'perfect' Communist antifascists?
51	Lindsay Walker & Tish Whitehurst	Adding value: an inclusive approach to an undergraduate pro-bono activity
52	Ed Fry	Designing expressive user interfaces for interactive music technology

53	Adam Charvat, Francis Desmind, Filip Zukoswki, Ethan Venencia & Alexander Good	Bristol Bike: developing a mobile app to encourage regular exercise
54	Harry Davies	The application of game design methods to create educational-centred serious games
55	Jie Ooi	Manufacturing a small, thin, flexible wing for a dragonfly-like Micro Aerial Vehicle (MAV)
56	Michalis Pantelidi	Creating an Aids-free future: getting to zero by 2030
57	Christian Martin, Nicholas Kimber, Jacob Hatherell, Robert McGregor, Kieran Dennington, Anthony Kepple, Andrew Geddes, Lester James, Magnus Chapman, Richard Clark, Cory Richards & Jason Matthews	Learning beyond the university curriculum via student competitions: A case study of UWE Formula Student
58	Eva Ashford	Can the space we live within show a history?
59	Connor Simpson	Use of transposon libraries to identify genes involved in *Pseudomonas syringae* pv. tomato DC3000 plant colonization

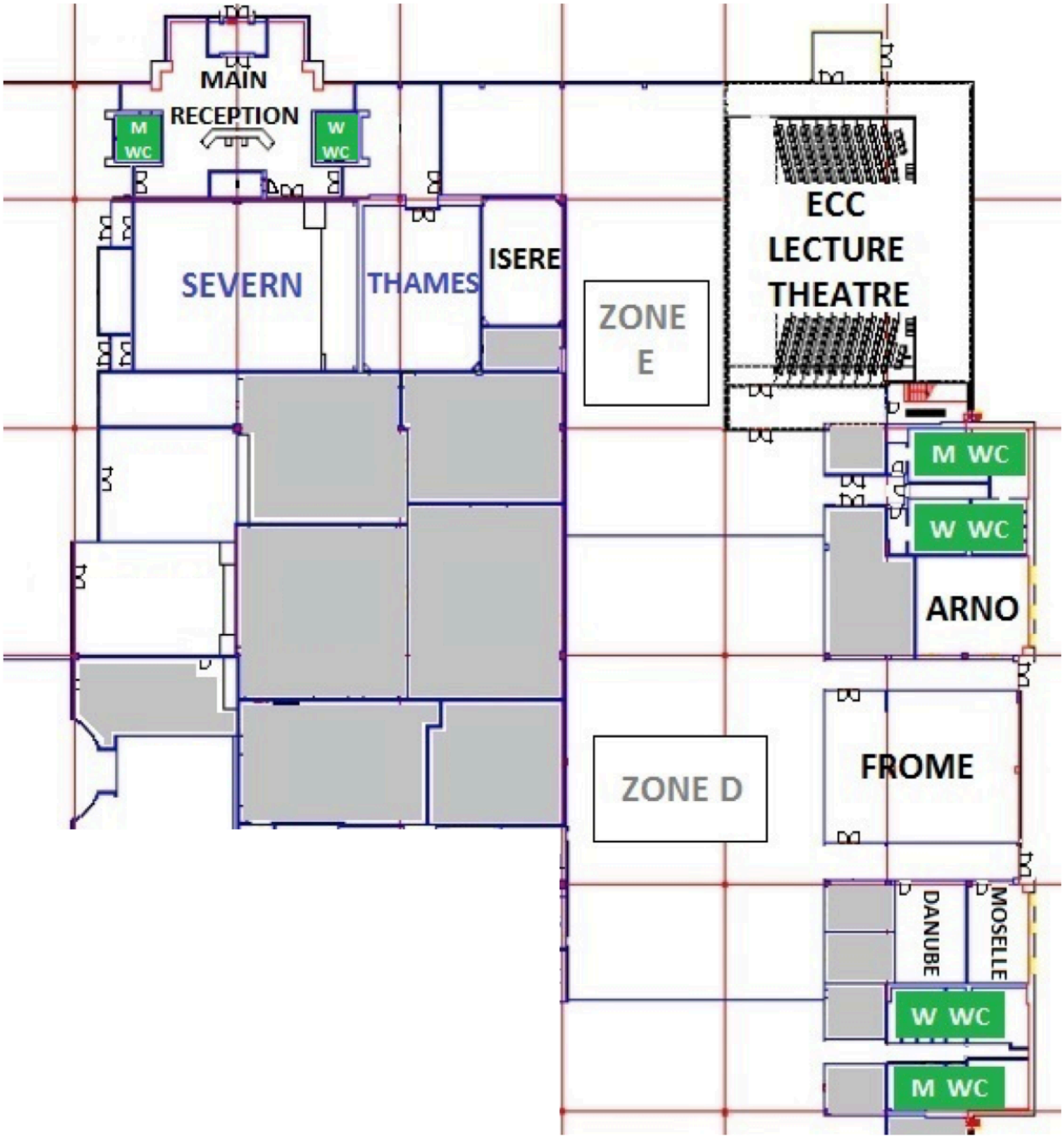
Programme – Verbal Paper Session B (14:45)

Stream	Author(s)	Title
Stream 8 (Severn)	Nikki Green	Tuberculosis through the ages: the problem with antibiotics
	Tessa-Louise Duell	Does your second language affect your native conceptualisations of verbs - the case of Romanian deschide (to open): a psycho-linguistic study

	Jen Sning Cheong	From Malaysia to the United Kingdom: personally embracing the process of change
	Zaleta Kasenzi	How the unyielding identity of the Black Panther Party was a major contributor to its downfall
Stream 9 (Thames)	James Brackenbury	Beyond black flags: how linguistics and narrative can provide an effective model for the strategic culture analysis of DAESH
	Dean Smith	An investigation into the use of V-Tails on a delta wing configuration at supersonic speeds
	Maherush Khan	How the caste system contributes to the exploitation of Dalit women within the textile industry - A study of South India
	Patryk Janus	No, we're not sick perverts! An analysis of an anti-LGBT+ discourse in Poland
Stream 10 (Lecture T)	James Grant	What are the benefits, limitations and potential of The OT Hub for occupational therapy? Evaluating a new online platform for the profession
	Sarah Bannister	What roles do city farms have in building communities?
	Kathryn Hamilton & Julie Mytton	The effectiveness of active case finding for tuberculosis in homeless populations: a systematic review
	Regina Dimitratou	Happiness within space: architectural utopianism in the physical reality of today's world
Stream 11 (Frome)	Raphaella Silva	The correlation between our emotions, moods and surroundings

	Ang Hui Qing	Trekking through Malaysia
	Isaac Lucksted	Using Unmanned Aerial Vehicles (UAVs) to inform management of the large blue butterfly (*Maculinea arion*) in Daneway Banks, a Site of Special Scientific Interest
	Bryony Martin	Reconciling humans, existential freedom and nature: exploring existential concepts through Sartre, process philosophy and Schelling
Stream 12 (Arno)	Nkeiruka Edeh, Emmanuel Adukwu, Vincent Chigor & Anna Bako	Assessing the microbial quality of water from different local sources in an urban town in South East Nigeria, Nsukka
	Natalie Neoh	Does the law satisfy modern divorce?
	Miriam Cristofoletti & Mihai Anca	A multimodal robot interaction system for automatic feeding tasks
	Iraje Nadeem Ahmed	Leadership development through UWE: a student radiographer's journey
Stream 13 (Isere)	Joe Laughton	Optimising the cooling of an exhaust gas recirculation system to reduce emissions from a diesel engine
	Onyeka Okeke, Kerellos Mishirik, Francis Ekechukwu & Huan Li	A GIS-based evacuation plan for high flood risk areas in Bristol
	Kate Holland	How are occupations used to improve well-being in communities following a natural disaster? Implications for Occupational Therapy
	Sara Cristofoletti	Hyperloop One: implications for the UK economy

Venue Map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Verbal Paper Session A

Stream 1:

The potential impact of Brexit on hotel investment in the UK

Estelle Murer
Architecture and the Built Environment

In 2015, UK hotel investment was booming and surpassed pre-financial crisis levels. However, when Prime Minister David Cameron announced the EU referendum in February 2016, investment paused and only a few hotel transactions were completed before 23rd June. The vote result emerged and a few months later the weak pound had helped increase overseas visitor numbers to the UK, along with increased British 'staycations' due to their reduced purchasing power abroad. As a result, hotel bookings experienced steady growth, but investors remained reluctant to invest. The hotel investment market stagnated for a time and finally gained some momentum in the fourth quartile of 2016. The uncertainty caused by Brexit is still impacting UK hotel investment volumes. Some investors are looking for opportunities elsewhere in Europe, while others are continuing to invest, hoping for a positive outcome for the industry post-Brexit. New players have also entered the market, looking for opportunistic deals. The aim of this research is to identify what type of properties are set to benefit from the impact Brexit has on hotel trading performance, based on their location, operating structure, tenure, size, source market and star rating. While there is much speculation in the industry about the impact of Brexit, there has been little academic analysis. Furthermore, property-related firms have produced some research but it often reflects the opinion/vision of a single type of stakeholder and can be biased by the strategic need to paint a positive picture of the industry. This research aims to provide industry stakeholders with an impartial 360 vision of the UK hotel market in the context of Brexit, which should help them to plan for and deliver a positive future.

Using CRISPR/Cas9 to investigate the causes of inherited blindness

Cuong Ngo & Gabrielle Wheway
Applied Sciences

Retinitis pigmentosa (RP) is an inherited disease characterised by progressive degradation and loss of photoreceptor cells in the retina leading to eventual blindness. It affects nearly 1 in 3,500 to 1 in 4,000 people in Europe and the United States. Mutations in genes encoding pre-mRNA splicing factors (PRPFs) have been implicated as the second most common cause of autosomal dominant RP. Amongst these proteins, PRPF8 is the most highly conserved and largest protein at 200kDa, which has been shown to be essential for pre-mRNA splicing. The exact mechanisms by which PRPF8 mutations underlie the disease remains unclear; why do mutations in splicing proteins cause a disease which only affects the retina, when splicing is an essential process for all cells? An alternative hypothesis is that PRPF8 may have a secondary function in the ciliogenesis of photoreceptor outer segment and retinal pigment epithelium (RPE) in addition to its ubiquitous function in RNA processing.

This project applied CRISPR/Cas9 genome editing techniques to attempt to mutate PRPF8 in retinal cells to investigate protein function. We investigated the efficiency of two guide RNAs (gRNAs) at targeting Cas9 nuclease PRPF8 gene in human RPE cell lines (hTERT-RPE1) for

introducing human mutations. Specific PCR products from PRPF8 were cut by restriction enzyme (T7 endonuclease 1), which specifically recognises sites of heteroduplex. Gel electrophoresis and Agilent 2100 Bioanalyser were then used to detect and analyse the digested fragments in terms of their size and concentration. If PCR products are cut at expected size, further work will be required to confirm if these induced mutations indeed cause any abnormalities in RPE cilia and photoreceptor cells, eventually progressing to photoreceptor dystrophies in RP. This will be beneficial for more effective treatments of PRPF-linked RP in future.

The lie of benevolence: the white-washing of abolition and the de-radicalisation of black history

Tayo Lewin-Turner
Arts and Cultural Industries

Who do we thank for the eventual emancipation of millions of Black Africans? Historians, scholars and teachers have been obstinately waving the flag for British politicians and activists for years. Whether it is Wilberforce, Clarkson or Granville Sharpe, there is often a glaring omission in any discussion of abolition; the enslaved people themselves. The narrative we have been sold is one of a linear timeline of progression, where Britain, soon followed by other European nations, finally did the right thing. This is a narrative where the poor African 'slave' had capitulated to his or her destiny of enslavement until a generous, caring white man saved them from their destitute existence; one where the former enslaved is forever beholden to the charitable European. However, this is not the case. Enslaved Africans had been fighting for abolition from the inception of the Transatlantic Slave Trade. Hundreds of 'slave' uprisings and rebellions took place in the Caribbean, yet they are often disregarded or downplayed by mainstream historians and educators. These rebellions, one by one, broke the back of the slave trade until abolition was Europe's only option; there is no better example of this than the Haitian Revolution.

Using both primary and secondary data sources, I aim to provide the basis for a change in the narrative of abolition. As well as demythologizing the idea of eventual benevolence on behalf of Europeans, I will shed light on the unsung heroes of abolition, whose names are seldom spoken in academic institutes. Conclusively, I am asking: who really freed the 'slaves'?

Designing a flexible matrix composite morphing skin for plane wings

Rafael Heeb
Engineering, Design and Mathematics

During take-off and landing aircraft require high lift devices, such as leading edge slats and trailing edge flaps, in order to generate extra lift. These devices generate significant amounts of turbulence (drag), produced by the gaps between the main wing and the high lift devices.

Morphing wings can actively or passively change their shape so that aerodynamic performance is optimised during the required flight mission. Early forms of this concept were adopted in the first motor powered flight by the Wright brothers. A significant amount of research has gone into finding ways to design such wings. However, one area that has seen

comparatively little research is the skin that goes over the wing. A requirement is that there are no discontinuities of the skin in order to reduce turbulence.

Morphing skins have to undergo large in-plane deformation when they are actuated, whilst withstanding out-of plane aerodynamic forces. The skin that is being developed in this research is made from two components. An underlying part, made from a corrugated structure developed by ETH Zürich, will take the main aerodynamic loading. The second part is the top layer skin, which is made from a flexible matrix composite. This must be designed such that the deformation from aerodynamic loading is very minimal, whilst keeping the actuation force as small as possible. This is achieved by altering the carbon fibre orientation within the skin. Wind tunnel and static tests are used to gather data on whether the skin can be actuated with less force.

Stream 2:

Developing peer-led student supervision in practice: an evaluation

Stephanie Morris
Nursing & Midwifery

A student support group was set up in the Avon and Wiltshire Mental Health Partnership (AWP) Trust supporting students in practice placements from nursing and allied health professional courses from the University of the West of England (UWE) and Bath University. Five peer-led supervision sessions were voluntarily facilitated by a second year student Mental Health Nurse. Drop in, informal sessions were facilitated with a framework guiding supervision including mindfulness and reflective practice. Contemporary literature suggests current practice within healthcare settings for employees commonly utilises peer-led and group supervision due to financial and resource constraints. However, anecdotal evidence received from group participants confirms this is not common practice within university/practiceenvironments. Participating students completed feedback forms at the end of each session providing quantitative (using a likert scale) and qualitative responses assessing the usefulness and need for peer-led supervision sessions. Forms were analysed and themes identified. Key themes emerged showing that student nurses, occupational therapists and trainee psychologists found the experience of peer-led supervision beneficial for discussing problems within practice, developing reflective thinking skills, gaining support, advice and different perspectives from other students, independent of assessment, benefiting from working inter-professionally. Evaluation of supervision sessions has highlighted a need for peer-led supervision in practice, demonstrating a pivotal role in developing future nurses and allied healthcare professional clinical skills. Peer-led supervision groups provide a platform to develop skills within the NMC student competencies, for engaging with and appropriately seeking supervision in a helpful and meaningful way, encouraging inter-professional working, and developing reflective practice abilities whilst promoting good clinical practice at an early stage of career progression. This evaluation further highlights the importance of peer-led group supervision in practice during and throughout training.

3D face recognition for biometric access control

Bryan Kneis
Computer Science & Creative Technologies

Biometric access control is the selective restriction to a place or resource in which the selection criterion is a person's biometric data. Biometric systems, such as fingerprint or retina scanners, have been deployed into markets but have ceased to gain popularity in the mainstream. My research is about understanding state of the art methods for both 2D and 3D face recognition and providing insights into their suitability within biometric access control, as well as proposing novel methods to bridge gaps in the literature. Currently, the majority of face recognition systems use 2D information and are limited by a number of variations. The use of 3D face recognition is gaining more attention as research shows that it can overcome some of these variants, such as illumination and pose, two of the most prominent real world challenges.

Securing access to places and resources has always been challenging and typically sacrifices convenience for the sake of security. As such these systems lead to poor user experience and make some applications impractical. The use of biometrics can eliminate many authentication challenges and allow people to securely and seamlessly authenticate resources such as their phone, laptop or credit card. An example of this can be seen in the new iPhone X using face id.

The reason why this research is imperative to the field is to examine the practicalities of 3D face recognition and offer an evaluation on its suitability using current methods. Although preliminary studies demonstrate good performance, a lot of them require expensive/specialist hardware, use copious amounts of computer resources, or have not been thoroughly tested with real world data.

A qualitative review of the perception of the concept of the 'friend zone' amongst millennials

Chris Grundy
Health & Social Sciences

Whilst there have been some studies (e.g. Bleske-Rechek *et al.,* 2012) on the phenomenon of one person wanting more from a real world relationship than the other, there appear to be none specifically looking into the concept of the 'friend zone'. The 'friend zone' is defined as a situation in which a friendship exists between two people, one of whom has an unreciprocated romantic or sexual interest in the other. This qualitative study hopes to obtain insight into this experience and how it is viewed in society now that it has gained an increasingly recognisable moniker. Young adult participants (age range of 21-35 years) were asked to undertake a story completion task involving a narrative where one of two people has been 'friend-zoned'. The stories obtained were subjected to thematic analysis (Braun & Clarke, 2006) in order to delineate themes implicated in these relationships. Whilst the project is currently collecting data, themes are starting to emerge pertaining to the perceived character of the person who has been 'friend zoned', and these relate to disproportionate attribution of blame and missed opportunity. Methodological issues pertaining to story completion and its suitability for the research will also be discussed.

Effect of conventional versus non-conventional treatment on *C. albicans*

Stephanie Udoh
Applied Sciences

Background: *C. albicans* is a significant pathogen involved in several local and systemic fungal infections with increasing resistance to many widely used drugs. Essential oils (EOs) are plant extracts with highly volatile aroma compounds. They have recently been understood to possess antimicrobial properties and can thereby be developed as potential alternatives in the treatment of various microbial infections. This study investigated the antifungal effects of selected EOs and an antifungal agent, Miconazole, against two *C. albicans* strains.

Methods: Antimicrobial susceptibility screening was carried out for two *C. albicans* strains (*C. albicans* ATCC 2091 & *C. albicans* 173) using the disk diffusion method (direct contact and vapour exposure). The minimum inhibitory concentration (MIC) and minimum fungicidal concentration (MFC) was also determined via broth micro dilution in a 96 well plate (v/v). Also, morphological alteration of *C. albicans* 173 cells before and after treatment was observed via scanning electron microscopy, lactofuschin stain and culture on cornmeal agar. Statistical analysis was performed using Minitab and Excel to obtain p-values via 2 way ANOVA with replication ($p<0.05$ considered significant).

Results: The two *C. albicans* strains were susceptible to lemongrass, clove, tea-tree and lavender with zones of inhibition (ZOI) ranging from 5.71mm to 78mm (direct contact) and 11.1mm to 67.2mm (vapour). Lemongrass exhibited the strongest antifungal effect with MIC between 0.03% and 0.06% for both strains and MFC of 0.13%. Miconazole showed some antifungal activity but was only as effective as clove, the second most effective EO. Analysis showed strong evidence to suggest that the oils had significant effect on the two *C. albicans* strains ($p=0.00<0.05$). On cornmeal agar, most *C. albicans* 173 cells appeared in hyphal form after treatment with EO.

Conclusion: In comparison to miconazole and other EOs tested, lemongrass proved to be most effective, causing morphological alterations to *C. albicans* cells.

Stream 3:

Integration of Building Information Modelling (BIM) with Internet of Things (IoT) Data Analytics (DA) to enable smart city development

Amer Hijazi
Architecture and the Built Environment

In the UK, as in many developed economies, our social and economic infrastructure is mature and in need of extensive maintenance, renewal and modification to meet emerging needs. UK facilities and networks are becoming ever more integrated, to the point where their reliability often determines their capacity, stifling economic growth and social wellbeing. In the aftermath of the financial crisis of 2008, HM Government has limited resources to spend on new infrastructure. When new projects are proposed there is

invariably opposition to them because of their impact on the environment and the disruption they cause. Over the next decade, technology will combine with the Internet of Things (IoT) (providing sensors and other information), advanced Data Analytics (DA) and the digital economy to enable us to plan new infrastructure more effectively, build it at lower cost and operate and maintain it more efficiently. Above all, it will enable citizens to make better use of the infrastructure they already have.

As such, this project aims is to investigate integration of Building Information Modelling (BIM) with IoT DA to enable smart city 2025 based on Digital Built Britain (DBB). As such, the following objectives are pursued: critically reviewing PAS 1192-5:2015/180/181/182 based on the target Smart City 2025; introducing the smart city concept model by integrating BIM, smart asset management and IoT; and simplifying the process by including geometry and data in the same data package. The research also aims to understand how the BIM Common Data Environment (CDE) and current BIM data exchange can enable Smart City dependency analytics on the web across the world and it will investigate how adoption of IoT might affect smart asset management and project delivery.

A system for automated visualisation creation and recommendation based on fusion and analysis of multi-variate data

Oliver Wilkinson
Computer Science & Creative Technologies

In data visualisation there are a number of established rules. However, there is no way of knowing if we are visualising the data 'correctly'. Often, users will pick a standard chart such as a bar or line chart, even though these particular options may provide no useful data insight, simply because these are common visualisations to most people and software packages.

There are two main research areas to this project. First, the automation of Extract, Transform, Load tools (ETL) using Data Engineering principles is explored, for use by data-capable, not tech-capable analysts. Second, and more importantly, is the ability to automatically recommend, create and share visualisations based on what will convey interesting information about the data. The recommendation system must inform users statistically which visualisations are the most interesting and show the most information.

The project should enable users to load multiple datasets, join and transform them, and finally recommend, produce and share visualisations, all without needing to have any knowledge of data engineering and programming. The recommendation system should be able to explain to users why graphs have been recommended.

Evaluating the communication of Ebola Virus Disease in Sub-Saharan Africa from 2013-2017

Brodie Walker
Applied Sciences

Ebola is a haemorrhagic disease that rapidly takes a healthy individual to a diseased state; the fatality rates range from 25-90% and there is no vaccine or targeted treatment. The 2014 Ebola outbreak in West Africa was the largest to date with >28,000 cases and

>11,000 fatalities. The inability to control this unparalleled public health outbreak exposed the grave inadequacies of national and international institutions, which are responsible for protecting the public from the consequences of an infectious disease, and spurred public health officials to re-evaluate the way public health emergencies are co-ordinated and communicated. This project identifies, using the systematic review method, if the short-comings in communication of Ebola were the cause of the preventable devastation. It is well documented that an adequate communication channel, information transparency and better education on the outbreak could have saved many lives.

The study aimed to assess the communication of Ebola Virus Disease (EVD) on quality, availability and accessibility, and to see if the differences within these parameters affected the outcomes in different countries. The study compared two African countries with vastly different outcomes from the 2014 outbreak; Nigeria and Liberia, to draw a conclusion on whether the differences within these communication parameters were the cause of their success or failure. The study has identified grave inadequacies in the communication of EVD within Liberia and how lack of communication, misinformation and fear affected the outbreak. The study has also identified the successful communication techniques used by Nigeria as well as the unexploited communication channels available. These findings have enabled the formulation of a theory-based framework on how to successfully communicate EVD in sub-Saharan Africa to prevent devastation in future outbreaks. This framework will be extremely significant in future outbreak(s) of EVD and may provide a platform for the development of communication strategies for other communicable diseases within sub-Saharan Africa.

The electrochemical behaviour of 2,4-dinitrotoluene and its determination in vapour as a possible sensor for explosives and their residues

Nayomi Illansinhage Don
Applied Sciences

The aim of this study was to develop an electrochemical sensor for the determination of nitroaromatic explosives and their residues in air. The principle volatile component of nitro-based explosives is 2,4-dinitrotoluene. Consequently, this was chosen as the target analyte for investigation. The study was divided into two sections. In the first section, cyclic voltammetric studies were undertaken to investigate the electrochemical behaviour of 2,4-dinitrotoluene at a glassy carbon electrode. This technique allows for the redox behaviour of 2,4-dinitrotoluene to be explored and the optimum conditions such as pH and supporting electrolyte to be identified. Studies were undertaken using a supporting electrolyte of 10% acetonitrile in 0.1 M phosphate buffer over the pH range 2-10. The effect of scan rate was also investigated and the diffusion controlled reaction identified. The voltammograms showed two reduction peaks on the initial negative going scan resulting from the reduction of the two nitro groups. On the subsequent positive going scan a single oxidation peak was recorded, resulting from the oxidation of the hydroxylamine generated on the initial negative scan. This oxidation peak offered a number of analytical advantages and was chosen for further investigation. The second part of the project investigated whether this electrochemical process could be exploited as the basis of a detector for 2,4-dinitrotoluene vapour in air to detect hidden explosives. Investigations were made into the possibility of utilising advanced electrochemical waveforms such as square wave and differential pulse voltammetry to determine 2,4-dinitrotoluene vapours, thus simulating the situation of a buried or hidden explosive.

Stream 4:

Machine vision-based fall detection by the elderly using deep neural networks

Jake Rowe
Engineering, Design & Mathematics

For the elderly (65+) falls are the most common cause of unintentional injury and injury-related death. Response time to fall events are critical to helping prevent further injury, especially when the person is unable to get up. Therefore, development in effective fall detection methods will be paramount in providing a higher level of comfort for the elderly and vulnerable population. This study aims to accurately detect and classify fall events using a visual sensor based on machine vision techniques.

The research uses a GoogleNet Inception V3 Convolutional Neural Network architecture that was pre-trained on approximately 1.28 million images from the ImageNet dataset, and re-trained on our dataset using transfer learning. In this project, the proposed method is evaluated on a dataset containing pre-recorded videos of 'actors' simulating daily life and fall events. To test the method against realistic data, we also collected our own fall detection dataset containing different scenes and different types of falling.

The proposed method is compared against the state of the art fall detection methods, including the use of different models of neural networks. The proposed visual system is also compared to the use of wearable devices. Development of the network is on-going. Results are expected to be in the range of 80% or higher for successful classification, based on the effectiveness of similar research. However, it is worth noting that a classification accuracy of 95% or higher would need to be achieved to ever make real world deployment feasible.

Assessing compliance of Vietnamese laws with WTO's Trade Facilitation Agreement (TFA)

My Nguyen
Bristol Law School

In 2015, Vietnam ratified the World Trade Organisation's Trade Facilitation Agreement (TFA), which was adopted to cut the 'red tape' that existed in cross-border goods movement. The Vietnamese government established a plan to prepare for implementing the TFA before it entered into force, including raising awareness of official staff and leaders of enterprises, determining commitments under the provisions, and reviewing relevant laws to meet international standards. Unfortunately, TFA entered into force on 22 February 2017 before the plan was finished. The Vietnamese government continues to implement its plan, although less actively. The government is ambitious to check every regulation within the legal documents related to trade issues. Nevertheless, it is difficult for officials to know where to begin with the huge quantity of provisions, and Law Inspection Departments often lack experts.

This socio-legal research aims to assess the extent to which Vietnamese laws comply with Section I of TFA, which contains provisions for transparency of information as well as release and clearance of goods. They are essential provisions in facilitating the global trading system. The research will analyse the requirements of Section I of TFA and

subsequently examine the legislative perspectives of trade law-makers and important terms in Vietnamese laws to identify regulatory gaps. The research is expected to narrow the scope of inspection and to direct the laws more specifically. The research will suggest specific reforms regarding Vietnamese trade laws and my findings can be applied when I return to Vietnam. Proposed solutions may be implemented in Ho Chi Minh City, where most transactional activities in the country are concentrated. The results could be sent to the Ministry of Industry and Trade as well as the Ministry of Finance.

Transforming the VCSL Programme into the UWE Exceptional Leadership Programme - A Proposal

Iraje Nadeem Ahmed, Stuart Gibbs, Yizhu Wen and Lauren Easterbrook
Allied Health Professions

The Vice-Chancellor's Student Leadership (VCSL) Programme equips students with leadership and team-working skills that are highly appreciated by employers. It achieves this through a strong curriculum aimed at providing these skills to the learners. Having enrolled on the programme last year (2017/18), I have empowered the cohort of 2017/18 to produce a consultancy group report which we will present at this conference.

The purpose of this group report was to investigate the current state of the VCSL Programme at UWE. It factored in the views of a range of internal and external stakeholders. This enabled us to analyse key themes, and to identify areas for review and possible improvement including strategies to ensure optimal student recruitment to the programme. As a group, we came together with the proposal 'Transforming VSCL into a UWE Exceptional Leadership Programme'. The final report is the sum of extensive research and analysis, which was undertaken over the course of four months.

Methodology: With the short turn-around of dates, we conducted a combination of face-to-face and online (over email/telephone) semi-structured interviews with our stakeholders. We used a range of pre-determined questions using the 'Golden Circle Model' (Why, How, What), which focuses on successful marketing strategies.

Results: After collation of the interviews, the answers were analysed to help us provide recommendations for the future running of the programme. The report will give an overview of the importance of this research, our methodology, findings/results and conclusions, offering recommendations for further improvements.

The lost leisure occupations of adults with Chronic Fatigue Syndrome/Myalgic Encephalomyelitis (CFS/ME)

Bob Clawley
Allied Health Professions

Introduction: Chronic Fatigue Syndrome (CFS), also known as Myalgic Encephalomyelitis (ME), is a long-term illness with no known cure. The most common symptom, extreme tiredness, has a significant impact on people and their ability to participate in meaningful occupations. CFS/ME can affect anyone during the life-course regardless of socio-economic factors or ethnicity. Prevalence in the UK is 0.2% to 0.4% (1 in 200). More women are affected than men at a ratio of 2:1. Literature suggests that even people with mild symptoms of CFS/ME are likely to have to relinquish leisure occupations and social activities. This may be detrimental to their occupational identity, health and well-being. However,

limited research exists regarding the types of occupations people with CFS/ME have lost because of the condition. The focus of this research was therefore to explore the lost leisure occupations of adults with CFS/ME.

Method: Thematic analysis was performed using anonymised, qualitative, secondary data provided by the Bath Centre for Fatigue Services (all ethical approvals were in place for this purpose). Data from the experiences of 63 adults with a diagnosis CFS/ME, who had consented to participate in research from 2010-2014, were included. Participants included men and women, ages 18 and 75+. Experiences were explored, and themes identified and synthesised into findings.

Findings: Emerging findings indicate that leisure occupations, particularly social activities and exercise, are lost resulting in occupational deprivation.

Conclusion: New insights have been gained into the experiences of people with CFS/ME and the impact of the condition on their participation in leisure occupations. Lost occupations can lead to occupational deprivation and have a negative impact on the health and well-being of individuals and groups.

Stream 5:

A student paramedic's journey towards breaking communication barriers in pre-hospital settings

Lauren Orchard
Allied Health Professions

Bonjour, Hola, Hallo, Ciao, Ola, Namaste, Salaam, Zdras-tvuy-te, Konnichiwa, Sawatdee-kah. Ten ways to say hello and yet, if a patient uses a different language to a paramedic, how do you break the communication barrier? To provide effective and safe clinical practice in pre-hospital settings a paramedic must utilise interpersonal skills conveying individual tailored approaches to each patient (Paramedicine, 2017). The Health Care Professional Council (HCPC) (2017) recognises interpersonal skills as an extremely important tool for paramedics. Effective communication tailored to individuals can lead to positive impact on each service user's emotional, mental and physical state. This results in enhanced satisfaction and patient outcomes. If a patient is comfortable with the paramedic, sound history can be obtained with potential diagnoses (Fundamentals of Paramedic Practice, 2015).

During my first clinical placement, I encountered three significant learning events based on patients presenting communication deterioration from life-changing illness. The purpose was to develop communication skills with patients from settings in care homes, rehabilitation and day centres. These are skills that can be transferred and utilised in the role of a paramedic in a pre-hospital setting (HCPC, 2017). The placement involved identifying methods of communication with those that were unable to communicate verbally. HCPC (2017) notes paramedics must be able to communicate with all ages in the community and be able to utilise verbal and non-verbal techniques.

Three case studies were included in the research, examining patients with conditions that present barriers to communication; Locked in syndrome, Dementia and Aphasia. Varied forms of communication were utilised to overcome these barriers; verbal, non-verbal and

written communication. This presentation will explore the evidence base to analyse my actions during these patient encounters, concluding that there are varied ways to communicate effectively, no matter how debilitating an illness is.

A reflection on a 'reading for pleasure' session in a Year 5 class within a 'reading for pleasure' school

Sophie Tatum
Education & Childhood

Research emphasises the multitude of benefits of a child's reading for pleasure, so much so, that the government felt it necessary to make this reading habit a requirement of the National Curriculum. Educators, therefore, not only have a duty but an obligation to foster reading for pleasure in their classrooms.

In order to meet this statutory requirement, it is argued that this may lead to the implementation of practice that demands reading for pleasure in a performance-like manner, with the consequential risk of children reading out of compliance and not pleasure.

This session will share the findings of an undergraduate dissertation that aims to illuminate the practice encountered during a teaching placement of a Year 5 'reading for pleasure' session within a school that sees itself as a 'reading for pleasure' school. The methodology adopted is an illuminative case study, which uses a mixed methods approach to data collection with the use of a questionnaire, observations of the 'reading for pleasure' session and interviews with four Year 5 children. The implementation of a 'reading for pleasure' pedagogy will be explored, along with consideration of the pupils' motivation to read and empowerment as readers during these sessions and a discussion of the complexity of factors involved in reading for pleasure. The session will explore if 'reading for pleasure' can ever be required.

Torture as a tool of counter-terrorism: the question of effectiveness

Dominika Benton
Bristol Law School

This project critically examines evidence concerning the effectiveness of interrogational torture in order to assess whether it should remain a legal prohibition. Sleep deprivation, waterboarding, stress positions: these are just a few interrogation techniques used by government officials to obtain intelligence they believe can forestall an imminent terror attack. Since 9/11 the use of torture and other coercive interrogation methods has been fiercely debated within government and amongst legal scholars. The legal prohibition of torture is absolute. Greer's argument goes against the explicit wording of various treaties, including Art 3 ECHR and Art 2 of the UN Convention. It also goes against the ECtHR interpretation of Art 3 and numerous UN committee findings. At one point, the Israeli state expressly permitted the use of 'moderate physical pressure' on prisoners whom they believed were in possession of intelligence that would avert an imminent attack. Although banned in 1999, the High Court of Justice used the necessity of defence as an excuse for coercive methods under certain circumstances. The US Government, along with the CIA, has argued that coercive interrogation techniques can work to produce timely and reliable intelligence. However, intelligence obtained as part of the CIA's High Value Detainee program during the 'War on Terror' was found to be speculative, including many false

confessions and information. Other issues surrounding the use and legalisation of torture as a response to terrorism include the possibility of increased recruitment, radicalisation of sympathisers, and the torturing of innocents. Evidence from Northern Ireland and Iraq suggests that terrorist groups use torture and the abuse of detainees as a means of attracting new recruits. Thus, the use of torture may actually increase terrorist violence. And so, for this, and many other reasons, torture should remain prohibited as its use does not prove to be an effective means of obtaining reliable, valuable and timely intelligence, and is potentially making matters worse.

Fingermark development on thermal paper using Vacuum Metal Deposition (VMD)

Megan McKnight
Applied Science

The aim of this research was to compare the effectiveness of different techniques for developing fingermarks on a range of till receipts. The techniques compared were Vacuum Metal Deposition (VMD) and the use of two chemicals; 8-Diazafluoren-9-one (DFO) and/or ninhydrin (Nin). VMD coats a fingermark with a thin film of silver particles followed by a thin layer of zinc particles. VMD develops marks made with both natural (sebaceous) oils and amino acids. The thermal layer on the receipts had to be removed using a solvent (acetone) before spraying with the chemical reagent and placing in an oven at 80^{o}C for 30 minutes. These chemical reagents react with the amino acid component of fingermark residue. Fingermarks were laid on receipts either after coating the finger in a standard deposit of amino acids or using groomed marks (clean fingers rubbed on the face before laying the marks). Development of fingermarks on receipts from three different retail outlets and an unprinted roll was compared. Fingermarks were laid across a cut in the paper to allow processing of the same mark by two different methods. The quality of a developed mark is assigned a number between 0 (no fingermark seen) and 4 (excellent detail of the whole mark). The average scores for each technique, deposit and paper were compared and there was little difference between the techniques for amino acid deposits or between the different papers (average score of 2.4). However, VMD was better (2.4) than all the chemical treatments (0.7) for groomed marks. As natural marks contain both amino acids and oils this research would suggest that VMD may be the preferable technique for this surface compared to the methods currently recommended which involve the use of the two chemical reagents compared here.

Stream 6:

United Nations Convention on the Law of the Sea: has it been adequate in dealing with piracy in the case of Somalia?

Saluuga Hasan
Bristol Law School

The United Nations Convention on the Law of the Sea (UNCLOS) has, for the most part, been a comprehensive convention, allowing for peaceful regulation of the sea. It has been responsible for numerous things, from creating maritime boundaries to regulating worldwide passage through territorial seas peacefully. However, recent issues such as piracy have shown that there are some gaps in the convention. Legal gaps have allowed for some

attacks at sea to escape the convention. A key case is Somalia which is a party to the convention, yet much of its attacks at sea are not legally considered piracy, mostly due to the geographical limitations and motivations of what can be considered piracy. Under UNCLOS, an attack does not constitute piracy if it happens within the territorial sea and if there are political motivations behind it. The attack must occur outside of territorial seas and it must be for private ends. Prosecution of Somali pirates has also highlighted human rights issues.

Because of the above issues, piracy cannot be adequately addressed under the convention. Occurring within its territorial seas, Somalia has had to deal with piracy in its waters. A country that is recovering from a civil war, which does not have the capacity to regulate its vast maritime space, means this is not a realistic possibility. This has led to numerous UN resolutions outside of the provisions of UNCLOS and the presence of over 40 naval forces to deter piracy. Whilst this has reduced Somali piracy, it has highlighted the gaps in the convention. Whilst current operations in Somali waters can reduce attacks momentarily, in the long term solutions such as amendments to UNCLOS and an international piracy or maritime tribunal can be a useful tool in tackling piracy.

Motivations of primary school teachers and creative practitioners engaging with a collaboration between science and dance. Case Study: The Flying Atoms

Siobhan Fairgreaves
Science Communication Unit

Creative methods of science communication can be used in schools to supplement formal education and primary school children, in particular, respond well to these methods. This study explored the work of the Flying Atoms, a dance group that toured Welsh primary schools communicating concepts in the field of physics using aerial dance. Specifically, this study sought to understand the motivations for engaging in a creative science communication project of the artists who produced and delivered the performances and of primary school teachers. Multiple methods of data collection were used to accommodate the participants. To gather opinions from the creative team semi-structured interviews were conducted and online questionnaires were used to collect data from teachers.

Throughout the data analysis stages, several themes emerged. Artists discussed their personal motivations for involvement in the project in depth and presented a strong ambition to target girls in their audience with the aim of tackling skewed gender representation in the field of science. Teachers were aware of the individuality of 'their' pupils and were keen to highlight the variety of personalities and how an experience could, and should, be personal to each child. Teachers also demonstrated a 'DIY' attitude and an interest in new activities or resources being made available. Across both groups, support was shown for the theoretical idea of combing dance and science for primary school children though some teachers did struggle to understand what this would look like in practice.

From this research, several recommendations were produced to facilitate better interaction between artists and teachers. For example, artists could trial a workshop helping teachers to implement their own creative science communication techniques whilst teachers are encouraged to retain an open-minded attitude to these methods. Recommendations were also produced to aid researchers working in this field in the future.

Immigration to Britain: lies, liabilities and lessons learned

Michael Henderson
Bristol Business School

The aim of this project is to highlight and dispel public misconceptions surrounding immigration to Britain. I will first highlight expectations about how immigration influences certain areas of the British economy. I will follow this with econometric and empirical data which challenges this, identifying the benefits of immigration in a post-Brexit Britain.

After extensive research I have concluded that immigration is essential to a prosperous economy. I found that most, if not all, the typical criticisms of immigration lack a solid foundation in reality. Likewise, I found that immigration, from an economic standpoint, is beneficial to local populations and their livelihoods. Indeed, the most important issue to consider seems to be public attitudes surrounding immigration. These attitudes sway policy-makers about the kinds of immigration policies to pursue. The pressures placed on policy-makers are also considered as they help to explain why, if immigration is positive for society, immigration policy does not reflect this. I advocate reducing social tension through education, which I hope can create greater social harmony and impact on policies regarding immigration.

Undertaking this research has allowed me to confront some of my own misconceptions. Admittedly, these may have arisen due to media influence, but it was an eye-opening experience learning how misinformed I was and it was very humbling. This research evoked a passionate response from me in which I not only attained a good mark, but I also genuinely cared about the subject matter. Being from London and British-born, I did not fully anticipate the plight that immigrants go through and this research has awoken my understanding of their plight.

Could measuring exhaled carbon dioxide address a proposed misclassification bias within out-of-hospital cardiac arrest research?

William Armstrong
Allied Health Professions

Context: Out-of-hospital cardiac arrest research may be subject to a misclassification bias, where patients who deteriorate to irreversible death prior to resuscitation are included within the study population. This could have skewed findings in many studies regarding the benefits and harms of life-saving interventions, such as adrenaline. This review explores whether end-tidal carbon dioxide [$ETCO_2$] measurements could identify patients with physiologies conducive to responding to resuscitation, and form a physiology-based eligibility criterion that addresses misclassification in future research. The outcome (return of spontaneous circulation [ROSC]) represented the minimum response from where patients may go on to survive.

Methods: Literature search of MEDLINE, EMBASE, and CINAHL, with critical analysis of relevant prospective cohort studies.

Results: An $ETCO_2$ threshold of 1.3kPa yielded 100% sensitivity for ROSC in 1,026 patients. However, some patients with pulmonary embolism [PE] achieved ROSC with readings

<1.3kPa. $ETCO_2$-ROSC trends ascended throughout resuscitation, and No-ROSC trends descended or remained <1.3kPa.

Discussion: Trends by timepoints produced more reliable data than overall averages, and accounted for confounding by initial alveolar CO_2 washout with respiratory aetiologies. However, power calculations for timepoints did not factor participants exiting the sample after ROSC, reducing statistical significance as time elapsed. $ETCO_2$-ROSC associations indicated the efficacy of adrenaline, vasopressin and bystander CPR. Evidence of PE confounding was weakened by observer and reporting biases, and aetiology subgroup allocation lacked adequate diagnostics and/or autopsy. Furthermore, the studies did not consider ventilation rate and tidal volume as confounders despite their demonstrated dynamicity on $ETCO_2$. Finally, variable precision of capnometric devices could reduce the practicality of using statistically adjusted thresholds.

Conclusion: Associations exist between $ETCO_2$ and response to resuscitation, therefore misclassification could be corrected through physiology-based eligibility in future research. To enhance assessment of $ETCO_2$ as an eligibility criterion, recommendations are made that could address the limitations of the studies reviewed.

Stream 7:

Creating a security culture in Higher Education Institutions

Rachel Davies
Computer Science and Creative Technologies

Cyber security is becoming an important issue, not only in the world of technology but also in the political, business and economic worlds. It is a positive step to implement good security technology to protect an organisation, but the most vulnerable organisations are often those that fail to create a culture of security. Organisations that fail to adjust to modern workplace needs, such as employees using their own devices at work, are far more likely to experience data breaches. Research reveals that factors such as conscientiousness, cultural assumptions and beliefs, and social conditions affect the information security awareness of staff in Higher Education Institutions. As such, my research examines the importance of creating a culture of security in Higher Education Institutions. When it comes to cyber security, Universities are particularly vulnerable. They hold a lot of data, have many networks and can comprise the largest IT infrastructures in their area. My aim is to answer the question of whether having a security culture is more productive and protective than implementing security controls and protocols. I will answer this question by focusing on how the universities of UWE and Bath Spa deal with issues of cyber security. I will deliver workshops on cyber security to see if employees become more aware and conscientious about security. I will also conduct interviews with members of IT staff from both institutions. Drawing on my quantitative and qualitative data, I will be able to test the theory that creating a security culture is relevant to positively altering staff awareness and practice in Higher Education Institutions.

Transnational eugenics in the inter-war years

Emma Harvey
Arts and Cultural Industries

Eugenics is a movement aimed at improving the genetic composition of the human race. This study examines transnational eugenics during the inter-war period and poses the questions of how eugenic movements were affected by the relationship between eugenicists internationally and the importance of international conferences. The project will use a combination of approaches to look at the transnational history of ideas. It will examine which ideas were shared at international conferences and how this is reflective of eugenic ideas and trends internationally. The interwar period was chosen for several reasons. Firstly, it incorporates the ideological catalyst of World War One, along with its demographic consequences. Secondly, this period saw a huge increase in the ease of communication, scientific exchange and international congresses and conferences as whole. In addition, eugenics itself was at its global peak during the 1920s. The project will look at both differences and consistencies across the eugenics movement, with consistency across transnational movements only recently emerging in the literature. Eugenics, in popular culture, is most commonly associated with Nazi Germany. In reality, however, eugenics was present across the world and political spectrum. For instance, the United States of America was the first country to implement an involuntary sterilization programme and eugenics was supported by many liberals such as William Beveridge. This project dispels the myth of eugenics as right wing and exclusively related to Germany, demonstrating that eugenics was a transnational social movement. The study uses fascinating sources, such as letters between the prominent eugenicists Leonard Darwin and Charles Davenport, to approach the subject in a novel and interesting way.

A multi-perspective evaluation of the 'Active Together for Dementia' partnership project

Rose Vincent
Health & Social Sciences

The increasing rate of dementia diagnosis and associated cost, coupled with a growing understanding of the impact on those living with dementia, has prompted an increased emergence of voluntary sector psychosocial support projects. With that in mind, it has been argued that there is a need for research focussing on the benefits of broader psychosocial interventions and evaluation of projects supplied by the voluntary sector (Cabrera *et al.,* 2017; Dugmore, Orrell and Spector, 2015).

The current study aimed to contribute to the literature in this emerging area through capturing the experience of participants, and their perceived impact, of a psychosocial support initiative. Specifically, the study sought to understand the experiences of people living with dementia and volunteers who participate in a befriending project. The project pairs together a volunteer with a person with dementia and facilitates them meeting regularly to go out together, taking part in an activity they both enjoy. The aim is to increase physical activity and social engagement of those living with dementia.

Semi-structured qualitative interviews were conducted with five volunteers and five people living with dementia who were recruited through the project. In order to identify barriers encountered in accessing projects and supporting more participation, the interviews were designed to encourage meaningful responses about people's experiences of the project and motivations for taking part. The data was analysed using thematic analysis to identify patterns and themes across the responses. The findings are expected to highlight motivations for taking part and reasons for continued participation, along with identifying barriers encountered in accessing volunteer projects and understanding personal experiences of the project to inform future practice.

Malware detection and analysis using machine learning

Alan Mills
Computer Science & Creative Technologies

Malware detection and analysis are important parts of cyber security. However, many current anti-malware (anti-virus) systems are behind the curve by design, relying on a regularly updated database that contains what are known as signatures for malware. The flaw in this system is that malware needs to be 'known' (in the database) before it can be detected.

Whilst there are alternatives to this system, they too have drawbacks. Behavioural analysis requires a sandbox environment (such as a virtual machine or VM) and cannot detect VM aware malware. Heuristic analysis does not require a sandbox (though can be run inside one). However, it can be defeated through code obfuscation (the addition of junk code). Both of these systems can be computationally expensive, potentially making them unsuitable for IoT (Internet of Things) devices or near real time critical sensor systems running with minimal resources.

My presentation will outline the findings from a lightweight machine learning based system that can detect unknown malware samples. This is not designed as a prevention system, but as a near real-time detection system, providing early warning, able to learn and retrain itself to consistently remain at the forefront of malware detection, without reliance on an internet connection or sandbox environment. I will cover the initial creation, design and implementation of the system, through its testing phase to its current version.

At the time of writing my system has been able to detect and correctly identify over 99% of previously unseen malware samples (all taken from VXvaults, an open source website containing multiple malware samples and updated each day). This is a proof-of- concept system, the implications of which could help re-shape the future of anti-malware systems.

Poster Presentations

How effective are socially inclusive day centres in promoting recovery for those with lived experiences of mental ill health?

Leila McGarel Groves
Health & Social Sciences

The overall aim of this research is to evaluate the services provided by Clarendon Recovery College in Hackney. The use of peer-assisted recovery and socially inclusive environments in supporting people with mental disorders in an outpatient facility will be reviewed and in doing so the benefits and possible improvements that the service provider can make will become apparent. The research design for this project involves interviewing the service users through open-ended questions about their lived experiences of the service in order to gain detail-rich qualitative answers. The anticipated findings for this research are that socially inclusive environments are paramount to the stable and consistent recovery of those with mental ill health. The evaluation of this service will highlight any areas of improvement that the service can make from the first-hand perspective of its users. The research will also contribute to the plausibility of services such as this one in the effective recovery of service users and will provide empirical evidence for their support and funding.

Investigating the optimum lift to drag ratio for an aircraft wing experiencing 'ground effect'

Brandon Robertson
Engineering, Design and Mathematics

Pilots flying aircraft close to the ground often comment on the plane 'floating'. This is due to the 'ground effect'; a phenomenon whereby air flow around the wing and body of the aircraft is affected by the ground beneath it causing increases in the lift force and decreases in the drag force experienced by the pilot. This paper aims to investigate the effects of changing the shape of the aerofoil of the wing by changing its camber, thickness and maximum camber location to identify the design trends where the ground effect has the largest impact. Aircrafts have already been developed taking advantage of the ground effect (called WIG's for wing in ground effect vehicles) to cover large expanses of water much more efficiently than their freestream counterparts. However, these are currently not used as standard alternatives. This is partly because it is a field in which limited research has been carried out, but there is great potential for very efficient aircraft that may wish to fly trans-Atlantic, trans-Pacific or trans-Indian. This would greatly reduce the impact of aircraft on the environment as they would require less fuel to remain in the air over the majority of the flight. The other benefit of this technology to society is the vastly improved speeds attainable by a WIG vehicle compared to a boat. This could be incredibly important in situations such as search and rescue where a rapid response is required. Another potential application is as an alternative transport mode for ocean cargo shipping.

A spectral and spatial comparison for assessing burn intensity as a result of the June 2017 Knysna Forest fire disaster using Landsat 8 and Sentinel-2 satellites

Paul Robinson
Geography & Environmental Management

Remote sensing is providing reliable and real-time global land coverage and assisting in a wide range of environmental and hazard management solutions, for example burn mapping. Research (Lentile *et al.,* 2007) has shown burn intensity frequently displays good correlations with multi-resolution remote sensing data and, in particular, when used in conjunction with pre and post-fire scene analysis. In this work, we compare the capabilities of the European Space Agency's (hereafter referred to as ESA) Sentinel-2 and the United States Geological Society (hereafter referred to as USGS) funded Landsat 8 satellites across spatial and spectral resolutions in assessing burn intensity. Individual wavelength or bands provide different information about the atmosphere and land surfaces which can influence emitted radiation detected by satellites. The challenge lies in correctly extracting this information from remotely sensed data, with the goal of providing end users with near-real-time information. The capacity of Normalized Difference Vegetation Index (hereafter referred to as NDVI) and Differential Normalized Burn Ratio (hereafter referred to as dNBR) indices have been used to process 16 scenes (8 per satellite) focussing on images recorded around the Knysna Forest region in South Africa between January and September 2017. Establishing which individual spectral band is most suited in discriminating burn is a key objective. Preliminary findings suggest the finer spectral resolution within the near infrared region provided by Sentinel-2, in particular the 'red-edge' bands, are most appropriate when paired with NDVI. Bands 8 and 8a indicate the best correlation with burn mapping. Band 5 appears the least suited. This theory is based on observations made against similar remote sensing data, for example Google Earth or outputs from the supervised classifications. These findings are also mirrored by similar research (Mallinis *et al.,* 2017) which used data from Sentinel-2A to analyse burn across the Mediterranean.

Measuring the mental well-being of international students at the University of the West of England, Bristol

Tanzida Haque & Caroline Flurey
Health & Social Sciences

Background: Within the university community, student demographic data highlights a high level of ethnic and cultural diversity and an 'at-risk' population for the onset of mental health problems. The aim of this study is to provide a snapshot of international students' experiences to enable strategic planning of future university support services.

Methods: An online survey (quantitative study) was conducted by sending a link to two validated questionnaires: Short Warwick Edinburgh Mental Well-being Scale (SWEMWBS) and the Perceived Stress Scale (PSS) to UWE student Facebook groups. To include students not connected to the internet, or who do not have access to social networking sites, data were collected in hard copy.

Results: The study captured 150 international students at UWE, Bristol. 52% (n=78) were female and 44.7% (n=67) were 18-25 years old, with a further 35.3% (n=53) aged between 25 and 30 years old. The number of postgraduate participants was higher (60%)

than undergraduate participants (40%). 53% were Asian, 26.7% were Black-African/Caribbean and 16.7% were Middle-Eastern. 48.7% of participants were single whereas 42.7% (n=64) were married. 32.7% (n=49) lived with friends during term time, 31.3% (n=47) lived with family/partner and 29.3% (n=44) lived alone. 46% were part-time employed and 45.3% (n=68) were unemployed. The study showed no significant difference in mental well-being status in terms of age, gender, level of study, ethnicity, marital status, employment status or who they lived with during term-time (p-value > 0.05). For perceived stress, the married or divorced students scored significantly higher than those students who were single (p-value = 0.00).

Conclusion: The study shows that international students who are divorced/married may need extra support. Further research is needed to identify whether support/preferences differ across different categories.

The effects of mercury pollution associated with artisanal and small-scale gold mining on the environment and local community of Bukuya, Mubende, Uganda

Mia Wreford
Geography & Environmental Management

Artisanal and small-scale gold mining (ASGM) is an important economic sector in many developing countries. However, limited resources and training and the availability of cheap but potentially hazardous methods of extraction and processing of minerals can cause significant threats to both miners and the local environment. The easiest and most cost-effective way of isolating gold from ore is through utilising mercury in the process of amalgamation. Waste from processing units is often discharged into inadequate tailings ponds or directly into rivers. Atmospheric mercury settles on plants and leaches into soils and water bodies. Mercury and methyl-mercury can bio-accumulate in the food chain which is a significant concern for those exposed to toxic levels of mercury through both direct and indirect means. This research was based in the previously unstudied village of Bukuya in Mubende, Uganda, where ASGM is active. The research objectives were to establish the severity of mercury pollution, identify pathways of contamination and determine high-risk areas of increased exposure. Fifty-six water, soil and plant samples were taken from two different catchment areas in the ASGM watershed, which denote areas experiencing different intensities of ASGM along the Kitumbi River. Total mercury concentration (THg) was determined by acid digestion of solid samples and use of Atomic Absorption Spectrophotometry. Results were of concern; all samples exceeded the government safety limit of natural and potable water (0.001mg/L), with a pattern of higher THg found in sites close to or downstream of ASGM. The highest reading of THg was found in a primary school borehole, close to active ASGM which exceeded the safety limit by 100 times. A strategy must be developed in Bukuya to encourage the use of safer mercury-free technologies for gold recovery which can ultimately improve the health of the surrounding environment and community.

Design and comparison of Vertical Axis Wind Turbine (VAWT) systems for modern homes in the UK

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Engineering, Design and Mathematics

This project focused on the design and modelling of a combined Darrieus-Savonius VAWT system to be fitted on modern homes with reference to UK weather conditions. The electrical energy usage in UK homes is steadily increasing as we incorporate more appliances and automated systems into our lives. According to figures from the building research establishment, energy use by UK households has risen 18% in the past 40 years. The European Union also requires member states to fulfil at least 20% of its total energy needs with renewables by 2020 as part of the Renewable Energy Directive. It is therefore important that renewable energy systems are developed in the UK to meet these targets. Vertical Axis Wind Turbines (VAWTs) are different to regular wind turbines as their blades spin around a vertical axis rather than a horizontal one. This allows them to produce electricity in any wind direction removing the need for complex systems such as a yaw drive and pitch mechanism as there is no need to point the turbine in the direction of the wind. Models of the main types of VAWT were created in the computer modelling software Solidworks, including the traditional Darrieus and Savonius designs enabling a comparison of their efficiency. Wind tunnel data was used to validate the initial Savonius model using real-world experimental results. The aerofoil shape and wind-lens type models were further validated using experimental results. Improvements were made to the initial Savonius rotor model that resulted in an efficiency increase. The most appropriate design was selected for use in new homes being built in the UK with improvements being made accordingly with reference to wind speeds experienced at various locations throughout the UK. The installation of a VAWT will result in significant electricity cost savings and contribute to reaching the EU's 20% renewable energy target.

Rapid in-vitro testing and characterisation of resistance to chemotherapy in Acute Myeloid Leukaemia

Amy Taylor, Josh Steven & Elizabeth Anderson
Applied Sciences

Daunorubicin (DNR) is a chemotherapeutic anthracycline commonly used alongside cytarabine in the intensive induction chemotherapy of Acute Myeloid Leukaemia (AML), aiming to induce complete remission in patients. Treatment success is impacted by chemotherapeutic resistance and presents as a major therapeutic challenge. Multidrug resistance (MDR) is associated with numerous mechanisms, but the best characterised is the overexpression of the drug-efflux transporter P-glycoprotein (P-gp), resulting in reduced intracellular concentration of the drug. However, the exact substrate for P-gp is unknown. The metabolism of DNR involves carbonyl reduction via carbonyl reductase (CR1) of DNR into daunorubicinol (DNRol). The use of a rapid pre-screening test prior to treatment would allow patient sensitivity to be assessed. The development of *Escherichia coli* (HA-1), a bioluminescent bacterial biosensor, provides same working day results of patient response to cytarabine in a clinical setting. The aim of this study was to characterise a novel anthracycline-resistant (K562R) cell line for mode of resistance and assess intracellular drug kinetics in a novel combined fluorescence/bioluminescence assay.

IC50 values for DNR treatment were significantly higher for K562R (8.4μM) compared to wild-type (4.8μM) ($p<0.001$) confirming anthracycline-resistance and correct functioning of

the model. Up-regulation of expression of CR1 and P-gp were concurrently identified by Western Blot. Pre-treatment with CR1 inhibitor zearalenone (5μM) increased both toxicity of DNR to K562R and intracellular fluorescence, indicating a dependence on CR1. Zearalenone inhibition of CR1 indicates that DNRol is the likely substrate for P-gp expression in K562R cells, with decreased efflux of the drug and increased intracellular concentration of DNR.

The response of K562 and K562R to co-dosed DNR/cytarabine by the novel combined assay demonstrated significant efflux of DNR following 1-hour drug exposure ($p<0.05$) despite consistent levels of the active metabolite ara-CTP. Future investigations in patient material are necessary to validate and miniaturise the assay for clinical use.

Factors that affect people's attitudes towards prison and punishment

Imogen Pengelly
Health & Social Sciences

There is a sensitive relationship between the public and crime; this we know. However, knowing what impacts people's attitudes towards crime could be of great use to many fields such as politics, education and the media. This work will aim to establish if there are any relationships - and examine the strength of these relationships - between different demographic variables and people's attitudes towards prison, punishment and rehabilitation. Demographic variables studied will include age, gender and education. Other factors such as address, religion and employment status will also be examined. The research will adopt correlational analysis across 100 participants who have completed an online survey. Expected findings are that participants who live in rural areas will be of the older generation, possess a lower education level and be more punitive (favourable of prison and harsh punishments). Likewise, opposing correlations are expected in the results. The results of this research have real-world implications in many areas such as education. If it is found that more educated respondents have less punitive views then efforts could be made to advance knowledge of adults and children alike. The political sphere could also benefit from this awareness as it would mean parties could further target their campaigns to suit respective audiences. Looking at the larger picture, if the public's attitudes could change, then politicians might change policy and practice to reflect this new liberal view. We might see less harsh and shorter sentences being imposed. Consequently, in the long term, a reduced prison population might be possible.

What effect has the introduction of gorilla infants in captivity had on the associations and interactions of the rest of the band?

Saqib Ahmed
Applied Sciences

This study examined the social interactions and associations of a captive band of Western Lowland gorillas (*Gorilla gorilla gorilla*) at Bristol Zoo Gardens with particular interest in the introduction of new offspring. During the course of the study eight individual gorillas were focally observed in weekly 4 hour sessions over the period of 2 months. Unfortunately, during the initial week of data collection the adult gorilla known as Salome was found to have died due to heart disease. This lead to further investigation into how the social interactions and associations of the band had altered.

To date there are only a handful of cases in which a Western Lowland gorilla has been born via an emergency caesarean. The infant Afia at Bristol Zoo Gardens is one of these rare cases. With regards to published literature, there is currently no existing research carried out indicating the effect that offspring born from these methods can have on the gorilla bands.

Preliminary investigations into the relationships of the gorillas have shown that a shift in the social dynamic has occurred. Initial analysis of the data collected shows that the offspring of the deceased gorilla now spends more time in close proximity with its father. With regard to the infant born via emergency caesarean, she now spends more time exploring the enclosure but can always be found in close proximity to her adoptive mother. In contrast, the biological mother of the infant has spent minimal time raising the infant and tends to be very solitary.

These preliminary findings suggest that the social interactions and associations have altered since the death of a long-lasting female member and the introduction of new offspring. Further analysis of the data obtained and more detailed comparison with previous data will make it possible to observe the extent of these altered relationships.

The role of hBCAT enzymes in the pathology of Alzheimer's disease

Abigail Oyelayo
Applied Sciences

Aminotransferase enzymes such as human branched-chain aminotransferase (BCAT) have been implicated in the pathology of Alzheimer's disease (Mandela & Ma, 2012). Increased BCAT levels are observed in Alzheimer's disease brains (Hull *et al.,* 2015), but the pathway by which BCAT is involved is unknown. Inside the cell, the primary function of BCAT is to break down branched-chain amino acids (BCAAs) into their keto acids and glutamate. These products act as fuel for energy and the latter is one of the major neurotransmitters in the brain. More recently, BCAT has been shown to have additional 'moonlighting' functions in the cell, which is governed by a signalling motif which senses changes in the cellular environment such as stress.

In this work, we used engineered cell models to reduce the levels of these proteins in the cell, our aim being to study the effect on cellular systems that regulated the cellular environment. Previous unpublished observations found that when BCAT was knocked down, Nrf2 protein (involved in regulating cellular stress) levels decreased. In addition, when BCAT was mutated (C335S) to lose its redox-sensing ability, Nrf2 protein levels increased. However, how BCAT interacts with the Nrf2 pathway is unknown.

This project aimed to investigate the role of BCAT in regulating Nrf2 and antioxidant-response enzyme expression and investigate whether an expression change occurs at transcription or post-transcriptionally. We discovered that an expression change occurs at the transcriptional level. We found that when BCAT levels were knocked down, Nrf2 and antioxidant-response enzyme transcriptional levels significantly decreased ($p<0.05$). The same pattern was seen when BCAT was overexpressed ($n=3$). Moreover, when the primary function of BCAT was inhibited, Nrf2 and the antioxidant-response enzymes transcriptional levels decreased. Our results suggest that BCATs primary function is involved with the Nrf2

pathway. Our study furthers the understanding of the association between aminotransferases, the Nrf2 pathway and Alzheimer's disease.

An investigation into the effect of land use on river channel water quality in South West England

Morwenna Masters
Geography & Environmental Management

Land use is a dominant factor affecting water quality within a river channel. This is due to water being a universal solvent, meaning it is able to pick up a multitude of environmental toxins and transfer these to the river channel via runoff. Research into the effect of land use on water quality varies. Osborne and Wiley (1998) concluded that urban areas increase the rate of phosphorus concentration in river channels. However, Ahearn *et al.* (2005) argue that population density has little effect on chemical concentrations. It can be accepted that land use significantly influences water quality, although its role requires further research. This study looks into the effect of water quality parameters (pH, nitrogen and phosphorus) against high and low covers of specified land uses (agricultural, urban, grassland, arable and mountain/heath/bog). The research is geographically restricted to localised catchments in Cornwall, Devon, Dorset, Somerset and Wiltshire. Secondary data were collected from the Water Quality archives of the NRFA and EA. The methodology enabled two datasets (land use percentage cover and chemical concentration) from 83 river catchments to be jointly analysed. The data are presented in box plots and scatter graphs visualising comparisons between chemical data for the catchments and differential land use cover. The results from this study suggest that certain land uses can detrimentally affect water quality. The most significant result is the effect of arable land use on nitrogen concentrations. The median nitrogen concentration for catchments with a low percentage of arable land use was 1.76mg/l compared to 6.58mg/l for catchments with a high percentage of arable land use. The results indicate that agricultural practices need changing, which could be achieved by implementing policies to reduce the chemical input into river channels.

Reflecting upon creativity in the context of a South African primary classroom

Charlotte Rawlinson
Education & Childhood

Through volunteering with UWE Bristol's Project Zulu in a rural township school in Kwazulu-Natal, South Africa, pedagogic methods, such as the prominence of 'chalk and talk', were observed and their impact upon the ways in which pupils were learning was reflected upon. In particular, the reflection was based upon the children's creative behaviours and the values surrounding creativity within the classroom. The impact of the learning environment upon creative teaching and learning was considered, as well as the concept of the child within traditional South African culture and how this impacts upon their role in the classroom. The methodology used was an exploratory auto-ethnographic case study. Qualitative data were used to develop explanations of the phenomenon of creativity. This led to recognising conflict between the rote learning observed in practice and the guidance of South African policy. The contrast between creativity inside and outside of the classroom was also observed and reasons for this were suggested. The use of auto-ethnography allowed the meanings of others' behaviour to be observed through the self, leading to the concept of reflection (Neuman, 2013). Reflective teaching is vital to the development of

professional values (Menter, 2011) so this reflection was recorded in a diary to enable thematic analysis. Following thematic analysis, the findings are not expected to be definitive answers but instead focus on the process of exploring the phenomenon of creativity. The outcomes of the process will be a developed understanding of both the teachers' and pupils' attitudes towards creativity and how rote learning impacts upon children's creative behaviours. This process will lead to the researcher reflecting on a sense of development of professional identity and how this will impact future practice.

How does treatment with chemotherapeutics compare to branched-chain amino acid restriction in leukaemic cell lines?

Rebecca Carter & George Redrup
Applied Sciences

Introduction: The branched-chain amino acids (BCAAs) - leucine, isoleucine and valine - are three of the nine essential amino acids needed for protein synthesis. Transamination of the BCAAs is catalysed by the human branched-chain amino transferase (hBCAT) enzyme of which there are two isoforms; mitochondrial (hBCATm) and cytosolic (hBCATc). Preliminary investigations by Hull (unpublished) identified that the expression of hBCATc is unique to immortal leukaemic cells, whereas in healthy leukocytes hBCATm is expressed.

Aims: This study investigated whether restriction of BCAAs affected cell (TK6/K562) viability, with the suggestion that modification to diet to exclude BCAAs may be a potential treatment for leukaemia patients. It also investigated the amino acid restriction in combination with, and in comparison to, treatment with chemotherapeutics.

Methods: The leukaemic cell lines TK6 and K562 were maintained in complete RPMI 1640 (10% foetal calf serum, 2mM glutamine), and stored in a humidified atmosphere at 37°C under 5% CO2. Cells were then grown in custom made BCAA restricted media (-Leucine, -Isoleucine and -Valine) and incubated for 48 hours. Cell viability was assessed using MTS and Glucose assays. This procedure was then repeated but also included a physiologically relevant dose of chemotherapeutic agent – Etoposide (10μM) for TK6 and Doxorubicin (5μM) for K562. Cell viability was assessed using an MTS assay.

Results: Preliminary investigations into the data suggest that individual restriction of the BCAAs (particularly Valine) is as effective at reducing cell viability as chemotherapeutic treatment on TK6 cells maintained in media containing all amino acids. Future treatment options could be developed to include BCAA diet restriction, in combination with chemotherapy, as a means of synergistically reducing leukaemic cell life in patients.

Getting young people involved in land cover monitoring: a case study with mobile applications in Greece

Adam Langford
Applied Sciences

Several fields including climate change and ecological research are reliant on accurate land cover maps. Mobile applications and associated citizen science schemes have been created to allow for faster collection of the required land cover validation data. These schemes regularly call for more contributors from a variety of backgrounds including young people and school groups.

To test whether land cover applications are considered interesting and accessible by young people, a mobile application was created for a site in the Voras Mountains in northern Greece. Data were collected on how visitors to a local youth centre used and interacted with the application. Twenty-nine participants between the ages of 10 and 17 took part. Participant observation, questionnaire and focus group data were triangulated to investigate their opinions of the application and the activities as a whole. GIS was also used to compare existing land cover maps of the area to participants' observations in the field.

Results suggest that the application increased knowledge of land cover mapping and different habitat types. Eighty-eight percent of participants stated that they would use the application outside of the study period with their friends, but no significant difference was found between the age groups ($p=0.439$). There was, however, a notable conflict between existing land cover maps and what was recorded by participants in the field. Focus group and questionnaire data were used to explain this, with a lack of in-app explanation and difficulty distinguishing cryptic land covers highlighted by participants as problems.

This research shows that land cover mapping can be both accessible and interesting to young audiences. Advice is given to ensure citizen science schemes are designed in a way to avoid the pitfalls and high conflict percentage seen in this study with the goal of increasing usage by young people.

User-oriented email threat analysis

Connor Best
Computer Sciences & Creative Technologies

Due to recurring media attention about the prevalence of malware and other online threats, this project aims to provide not only a method of protecting users but also educating them about common threats. Research shows that over 90% of companies have been hit by phishing attacks in 2016 and a number of those were the primary vector for spreading spyware and ransomware, another prevalent factor in modern-day cybercrime.

This project aims to teach lay users about the common threats they face over email by detecting and displaying those threats in an understandable way without fearmongering. In order to test if the email application created can be successful at educating individuals the app will be sent to a group of eight individuals specifically chosen across a range of ages. This will not only test whether the functionality is simple enough but also whether the information provided is explained clearly enough for users. Each of the test subjects will be asked to complete a short questionnaire detailing their use of the app and to write a short description of why an email in their spam folder was flagged.

Further development will include methods to ensure the app can be kept remotely up-to-date. Malware is always changing and, as such, an app focused on flagging it must be kept up-to-date, not only through intermittent updates, but also as an independent product. With basic machine learning prioritizing new terms and objects with every user, there comes new test data to further heighten the app's capacity and accuracy of detection. Through this research it is hoped that we can remove some of the automation bias held by many members of the general public and possibly discover new forms of malware earlier than previously viable.

An investigation into downstream changes in channel form for British rivers

Nadine McDougall
Geography & Environmental Management

Rivers are dynamic entities undergoing continuous adjustment over a range of temporal and spatial scales in a downstream direction. It has been postulated that a balance of driving variables and boundary conditions predominantly control channel form. Numerous studies have investigated downstream hydraulic geometry relationships and indicated that, although discharge has a dominant control on channel geometry, there are several other controls that influence channel morphology (e.g. geology, climate and riparian vegetation). Consequently, the aim of this research is to investigate downstream changes in channel form for British rivers.

This investigation involves the use of River Habitat Survey data that describe bankfull width and depth of 24,000+ sample points across Britain. These width and depth values are plotted against predictions of the dominant discharge (Qmed) for each sample point to create downstream hydraulic geometry relationships for all British rivers. The data are subsequently divided based on boundary conditions such as geology, bed material type and riparian vegetation to create separate hydraulic geometry relationships for different river types. It is anticipated that there will be increases in bankfull width and depth with dominant discharge and that there will be a differentiation in that these relationships will be separated according to the different river types. For example, with coarser bed material, it is expected that shallower rivers will be prevalent, or with the presence of riparian vegetation, narrower rivers will be evident. Overall, once relationships are identified they will be useful to help inform natural river channel design for river restoration projects.

Valentina Tereshkova and the Space Race

Maija Kolomainen
Arts & Cultural Industries

My research was initially examining Space Race history, to establish the beginning and end dates, but then I stumbled on a question 'Why was there such a huge gap between Soviet and American female astronauts' spaceflights?' Thus, this project aims to explore the gender issue, examining the reasons why a Soviet cosmonaut was the only woman to fly to space during the Space Race. In order to do so, I will explain the significance of the Space Race and the image of the first female cosmonaut, Valentina Tereshkova, in the context of the Cold War. I am using Soviet newspapers to verify historical events and the manner in which they were conveyed and perceived, with the help of other foreign newspapers such as The Times and American Life Magazine, to highlight different perspectives on the matter. Photography and other forms of media, such as primary film clips and speeches, are used to express Tereshkova's fame and her behaviour, to examine how much the Soviet government was controlling her character. An interview and biography would have played a key role in improving my research, however, the findings are slim which refer to the idea of Soviet upbringing and modesty of Tereshkova. The possible conclusion is that Soviet Ideology and the Space culture played key roles in giving Tereshkova the opportunity to fly to space, whereas the USA invested more in the Apollo Moon Project to win the Space Race. Tereshkova's deeds and actions are important to remember. Women especially were inspired by her, encouraging them into education, science and engineering, and improving equality.

The effect of bait and biogeographical variables on the abundance and diversity of butterflies in a historically disturbed Neotropical forest

Bethany Watkins
Applied Sciences

Climate change is one of the biggest threats to the natural world and the scientific community argues that these changes are human-induced. Over the last few decades tropical rainforests like the Amazon have experienced many types of human disturbance and are also one of the most important mitigators of the effects of global climate change. Therefore, understanding changes in the Amazon's ecosystems is essential to an understanding of global trends. Although most efforts to understand the rainforest have focused on primary rainforest, regenerating forests play an important role in the conservation of biodiversity. However, as rainforests are complex, dynamic ecosystems affected by biotic and abiotic factors, ecological indicators are often used to show change. Butterflies are often used as biological indicators but few studies have looked at how they respond to biogeographical variables. This study assesses the impact of bait type and several biogeographical variables on butterfly species abundance and diversity: forest type; canopy level; and season. The data was collected in The Manu Biosphere in the Peruvian Amazon as part of ongoing research carried out by the NGO The Crees Foundation. The results show that the type of bait used when trapping butterflies makes a significant difference to levels of abundance and diversity recorded. Carrion baited traps attracted greater abundance and showed greater diversity than fruit baited traps. Although for both baits abundance and diversity show an inverse relationship with disturbance level, canopy height and rainfall, the effect was greatest with carrion bait, in the least disturbed forest and at the lowest canopy level. Reasons for this variation are addressed with reference to: rainfall patterns; seasonal availability of fruit; and variation in the dietary needs of butterflies through their life-cycle. The implications of these findings for the design of surveys using butterflies as indicators are discussed.

What is that swimming in my pool? Using DNA traces to identify and monitor West Indian Manatee (*Trichechus manatus*)

Ilaria Zanetti
Applied Sciences

Accurate taxonomy of species is critical to conservation and management of biodiversity, allowing identification of species that need protection from, for example, illegal hunting and trade. Due to the challenging oceanic environment, marine mammals' taxonomy is increasingly being examined using molecular techniques, and a variation on cytochrome B (CYTB) is one of the most used markers for species identification. Specifically, tropical marine wildlife has been historically hunted and this has caused the extinction or endangering of the sea cow (Sirenia).

The aim of this study was to design and develop two sets of primers for *Trichechus manatus* (West Indian manatee) cytochrome B that will allow the identification of this species in an aquatic environment. The hope is that with this new protocol, not only will it be possible to better estimate the population size of *T. manatus* in the natural habitat, but it will also be possible to analyze biological material obtained from illegal hunting.

The CYTB sequences for *Trichechus species* (*T. inunguis*, *T. senegalensis* and *T. manatus*) and *Dugong dugong* (outgroup) were retrieved from NCBI databases. Primer Blast was used to blast two sets of primers and MAFFT and PCR simulation programs were used to test them in silico. These two sets of primers were tested with PCR and qPCR analysis on a synthetic CYTB minigene and on *T. manatus samples* (cheek swab and pool water) after extraction. We have produced two sets of primers that are ready for wet lab testing. If successful, we will have the essential component needed for the molecular monitoring of the species directly in the field, allowing a more precise estimation of population size and migration patterns. With this new information, it will be possible to set up 'migration corridors' that protect the species from human interferences.

A baseline assessment of the UN Sustainable Development Goals within European Student Union web environments

Thomas Haines, James Longhurst & Sam Bonnett
Applied Sciences

The world of student unions is under-researched, particularly relating to global issues and challenges, despite them holding a large proportion of the workforce of the future. At present, the European Students Union (ESU) has a duty of care to students within Europe, representing approximately 15 million students. Despite this, it is unclear if national student union policy and information reflects the range of global legislative efforts, which highlight student influence, in relation to economic, environmental and social aspects. This paper aims to address the disparity between these areas, with a specific focus on the 2015 United Nations Sustainable Development Goals, in partnership with the UK National Union of Students, under the Dissertations for Good Programme.

An innovative web mining method was created and refined over a 10-week data collection period, utilised on national European Student Union public web domains, against a pre-determined selection of keywords/phrases to quantify the overall knowledge and understanding of the Sustainable Development Goals, on a country by country basis. The UK National Union of Students was utilised as a control during this study, as a level standard across all nations analysed.

Having successfully analysed 39 of 42 European Student Unions with data from January 2014-18, this resulted in a wide range of keyword abundance, knowledge depth and breadth across member nations – highlighting disparity against developments in European education and knowledge standards such as the Bologna Process.To conclude, this research has highlighted both the lack of visual representation of the Sustainable Development Goals to students and therefore the variation in education quality across nations, allowing for a potential disparity of sustainability skillsets required by graduates on a global scale to tackle the world's challenges.

Ex situ conservation of the pancake tortoise (*Malacochersus tornieri*)

Joseph Leslie
Applied Sciences

The pancake tortoise is a species native to East Africa, with distinct populations in Kenya, Tanzania and Zambia. It is listed as vulnerable on the IUCN Red List and faces a significant threat from habitat loss to agriculture and exploitation in the pet trade. The pancake

tortoise's numbers have significantly reduced over the past few decades. To combat these losses, a breeding programme has been coordinated by zoos from the UK and across Europe. The tortoises held by these zoos consist largely of animals confiscated at customs during attempts to illegally export/import them from Africa to Europe.

When designing and coordinating a breeding programme it is important to consider the genetic viability of the captive population. Preventing inbreeding and maximising the genetic diversity of the population increases the chances of successful reintroduction to the wild and minimises the genetic degradation of the captive population. In an ideal situation, generations of pedigree information may be used by conservationists to design a breeding programme that maximises the genetic diversity of a population. However, in the case of the pancake tortoise, this pedigree information is unavailable because most of the tortoises are confiscated at customs, and therefore their relatedness to one another is unknown.

The aim of the present project is to inform the breeding programme by utilising genetic data to determine the relatedness of the tortoises within the breeding programme. Samples have been provided by zoos across Europe for analysis using molecular markers, genetic tools capable of determining the relatedness of one individual to another. By the end of the project, we hope to design a breeding programme that considers the relatedness of the tortoises, ensuring the longevity of the breeding programme and the species as a whole.

The effect of lemongrass essential oil on the gene expression of planktonic and biofilm *Staphylococcus aureus* and *Acinetobacter baumannii*

Nikki Green
Applied Sciences

Staphylococcus aureus and *Acinetobacter baumannii* are significant human pathogens that are becoming increasingly more resistant to conventional treatments. One survival and pathogenic mechanism of these organisms is the ability to form biofilms. This is where the bacteria aggregate, usually following attachment to a surface, essentially forming a microbial community. These biofilms are difficult to treat, adding to the resistant nature of the organisms. As such, alternative therapies are being investigated, one of which is essential oils. Lemongrass essential oil (LGO) has already been shown to be effective against both *S. aureus* and *A. baumannii*. However, the mode of action of LGO against the gene expression or function in these organisms has yet to be elucidated. Therefore, this study explored the effect of lemongrass on genes associated with biofilm formation from each organism.

Antimicrobial sensitivity tests with the LGO and two antibiotics were performed, then minimum inhibitory concentration and minimum bactericidal concentration assays were performed using the microtitre plate method to identify effective concentrations of LGO. Following this, a modified microtitre plate assay was performed to determine the biofilm inhibition and eradication concentrations. Finally, RNA was extracted from treated and untreated *S. aureus* and *A. baumannii* and PCR was performed to determine whether biofilm-associated genes were upregulated or downregulated upon exposure to LGO. Initial results show that the *S. aureus* strain is sensitive to both antibiotics and LGO, whilst the *A. baumannii* strain is sensitive to the LGO and one antibiotic but is resistant to the other. This suggests that LGO could eventually be used as a substitute for antibiotics.

Understanding, attitudes and awareness towards mild traumatic brain injury and its associated long-term effects within rugby union

Cameron Smith
Applied Sciences

This study investigated understanding and attitudes towards mild traumatic brain injury (MTBI), a term synonymous with concussion, and awareness of the long-term effects of repeated MTBI within rugby union. This included investigating awareness of chronic traumatic encephalopathy (CTE), a neurodegenerative condition causing significant cognitive decline and personality changes resulting from repeated MTBI. Participants of the study included 218 players, coaches and physiotherapists/first aiders involved in amateur, semi-professional and professional competition. Participants completed either an online or hard-copy questionnaire tailored to the role they undertook within rugby union.

The study found that participants at the amateur level had an all-round poorer awareness and understanding of MTBI compared to participants at the semi-professional and professional levels. Participants at the amateur level also deemed they had received less information about MTBI and the effects of repeated MTBI. Amateur physiotherapists/first aiders also deemed they had the lowest confidence in recognising symptoms of MTBI compared to their semi-professional and professional counterparts. Amateur players reported they would be the least likely to seek medical advice if they experienced a head injury, despite 66% reporting incidents. Of these, 75% had experienced two or more incidents despite also stating they had the greatest concern about the effects of repeated MTBI. Only 28% of participants were aware of CTE, with greatest awareness at the professional level. At an amateur level, 72% of participants stated they were unaware of CTE.

The study concluded that awareness and understanding of MTBI is poorest at the amateur level compared to a marked improvement at the semi-professional and professional levels. It highlights the need for an increase and improvement in information provided about MTBI and the effects of repeated MTBI, particularly the relationship to the risk of developing CTE that players expose themselves to.

Is students' fear of crime heightened as a result of the presence of different types of graffiti within Bristol?

Aara Mokhtary
Geography & Environmental Management

This research examines students' feelings of safety, perceptions of crime and culture, and whether they correlate with different forms of graffiti. The research is grounded in Broken Window Theory, which indicates that within a given area, disorder such as graffiti leads to further disorder and crime. Existing research suggests that there are generational variations in perceptions of graffiti and that younger people perceive graffiti more as art than vandalism. Exploring this idea through a cultural lens facilitates examination of the positive of negative values the student-age population attribute to graffiti.

The research was conducted as an online survey, which adopted photo elicitation, showing different types of graffiti and capturing the words that respondents associated with each

form. This included tagging, murals and smaller pieces of street art. The different types of tagging, street art and murals presented were from Stokes Croft, St. Pauls and North Street, Southville, as both areas have similar levels of crime and an abundance of different forms of graffiti. This enabled a comparison of responses based solely on graffiti type rather than other characteristics of the area.

The data collected from the survey were compared to crime statistics within the area, in order to assess whether there was a link between the two. Preliminary results indicate that the majority of participants appreciate murals and street art as part of a city's culture, whilst tagging is seen as vandalism and associated with the deterioration of the built environment. Future crime prevention strategies and efforts to positively engage young people in Bristol might focus on encouraging and promoting development of street art over tagging, potentially reducing fear of crime in areas with high volumes of tagged graffiti.

Coverage and inequalities in HIV and cancer promotion and prevention indicators among women in Kenya: A secondary analysis of Demographic Health Surveys

Anthony Manyara
Health & Social Sciences

Background: At the close of the Millennium Development Goals period in 2015, United Nations member states committed to the achievement of Sustainable Development Goals (SDGs) by 2030. Health and well-being is one of the SDGs with Universal Health Coverage (UHC) being one target of this goal. UHC is composed of two interrelated components: health services coverage; and financial protection coverage (nobody suffers financial hardships to access health services.) Health services consist of: treatment; and promotion and prevention. This study focussed on HIV and cancer promotion and prevention indicators.

Aim and objectives: The study aimed to determine the extent of equitability of promotion and prevention interventions over the MDGs implementation period. In particular, determination of coverage of selected indicators; inequalities in the indicators; and benchmarking Kenya's inequalities against other sub-Saharan Africa countries.

Methodology: A secondary analysis of Demographic Health Surveys with ratios, concentration indices and Theil indices were used to determine inequalities.

Results: HIV test coverage among women, and during antenatal care (ANC), improved and inequalities reduced between 2003 and 2014. However, post-test counselling during ANC had a lower coverage and slightly larger inequalities than HIV test during ANC. Cervical cancer awareness was high but with large region-based inequalities, while cervical and breast cancer screening had low coverage with large wealth, rural-urban and region-based inequalities. Compared to Lesotho and Namibia, Kenya had the largest region-based inequalities in all four cancer indicators.

Conclusion: Maintaining the current trend in HIV test coverage with more emphasis on post-test counselling would see it get to a UHC level. With respect to cancer, strategies to improve the low coverage and reduce inequalities should be explored such as integration of screening with other services such as HIV testing and mass population screening. Finally, there is need for consistent monitoring of relevant indicators and more research in this area.

Visitor educational experiences at Buckfastleigh Otter Sanctuary

Rosie Wibberley
Geography & Environmental Management

With increasing otter populations in Britain, new dangers for the species have arisen. Road traffic accidents have escalated during the last 15-20 years to become the major cause of death. To maintain the current increase in the otter population, it is important to be aware of new threats to otters. Ecotourism sites have the ability to promote the importance of otter conservation. Additionally, a general understanding of the people who take part in ecotourism is vital for successful management of a site (Hill and Gough, 2014).

This research investigates visitor educational experiences at Buckfastleigh Otter Sanctuary. The sanctuary has a mission of being 'a proactive contributor to the preservation of the wildlife of the planet with particular focus on otters and butterflies'. As such, this research aims to investigate visitor socio-demographics and motivations for visiting the site, visitor educational experiences and satisfaction, and the effectiveness of the sanctuary's management aims.

Questionnaires were completed by visitors to the site, both face-to-face and online. To analyse the collected data, bar and pie charts were used as a visual presentation. Additionally, chi-squared was used to test for significant differences between visitor satisfaction, education and visitor socio-demographics. Findings are expected to establish a relationship between visitor type and visitor satisfaction. It is also expected that during their visits to the sanctuary, visitors will not only enjoy themselves but have an educational experience. This corresponds with the sanctuary's mission and will help to protect otter populations into the future.

Development of a quantitative liquid chromatography tandem mass spectrometry method to determine time since last cannabis use from human urine samples

Samantha Osmond
Applied Sciences

Cannabis is the most commonly used recreational drug in the UK and both its recreational and medicinal use is one of the most polarising topics debated today. As the most commonly used recreational drug it is therefore the most commonly seen illicit drug through workplace testing programs. Testing programs look to identify the main metabolite, Δ9-tetrahydrocannabinol carboxylic acid (THC-COOH), and to quantify the level present, which if above 15ng/mL, indicates a positive sample under UK Workplace Testing Guidelines. As far as the guidelines are concerned a positive is a positive. However, some companies wish to have more details on usage, i.e. time since last use and they would like to monitor re-use. This poses a challenge for urinalysis interpretation using current methods.

A new analytical method has been designed, which has increased the number of cannabinoids and metabolites detected, and which increases the quantifiable range. It is hypothesized that this method can be applied to participant samples to establish if the levels detected or ratios of the cannabinoids can be used to determine time since last use. The ethics for this project have been approved. A questionnaire and diary has been designed as

part of the participant information sheet. To maintain anonymity completion of this form, along with the return of samples, provides informed consent. No participant samples have been analysed as yet. However, samples obtained from collaboration with UCL, whilst not meeting the overall aims of the study, have shown the method to be fit for purpose.

Does hierarchy influence allo-grooming in captive ring-tailed Lemurs (*Lemur catta*)?

Charlotte Carroll
Applied Sciences

Grooming in captive groups of ring-tailed lemurs has received very little attention when compared to literature about other aspects of sociality, such as reproductive behaviours and social organisation. This is surprising considering lemurs groom orally using an adapted lower incisor row, known as a dental comb, rather than using their hands for manual grooming like other anthropoids. The distribution of allo-grooming and reciprocal grooming behaviours were observed over 52 hours in a family of captive ring-tailed lemurs (*Lemur catta*) at Bristol Zoo. Displacement activities (e.g. taking food or an individual giving up an area for a higher ranking conspecific) were recorded in order to establish the hierarchy within the group. The aims of this study were: to establish the hierarchy that exists within the group; to find out whether rank influences allo-grooming behaviours; and to find out if higher ranking individuals are more attractive grooming partners when compared to their lower ranking counterparts. Predictions prior to this study expected females to rank considerably higher than the lone male in this group. Preliminary analyses not only confirm this prediction, but also show that grooming was performed most frequently between individuals of similar rank and that grooming behaviour was directed down the hierarchy, except when applied to the juveniles who were observed grooming both their parents, albeit only a few times.

An Investigation into the influence of heritage tourism on the monuments at Petra, Jordan

Annette Price
Geography & Environmental Management

This study investigates the influence of heritage tourism on the physical decay of the monuments in Petra, Jordan. This is particularly important in the context of the ancient city becoming a World Heritage Site in 1985 and its nomination, in 2007, to be added to UNESCO's New Seven Wonders of the World List. The resultant overall tourist flow increased significantly, far above the park's carrying capacity, bringing negative environmental impacts to Petra and causing it to be listed as an endangered site in the years of 1996, 1998, 2000 and 2002 by the World Monuments Fund. Previous research has focused on identification of aspects of tourist behaviour such as abrasion by shoe soles, sitting against the sandstone, rising levels of humidity and deposits of stearic acid through sweating hands, which are shown to have significant effects upon the deterioration of the sandstone. The majority of this research, however, focuses on these tourist behaviours and their impacts in the tombs of Petra and less so on the façades within the ancient city.

Using the level II 'Natural stones and weathering' working group classification scheme, an in situ technique used to conduct weathering assessments, damage diagnosis of 9 sites across 3 locations with varying tourist popularity was conducted. This was followed by a series of laboratory analyses to quantify which weathering indices identified during field observations

(temperature, water, salt, sweat and sun cream) were the most damaging. Finally, the results were analysed to suggest actions for enhanced sustainable management of Petra archaeological park.

A gravity compensation exoskeleton for patients with upper limb impairments

Benjamin Lewis
Engineering, Design & Mathematics

With the number of patients suffering from strokes and other similar illnesses increasing every year it has become apparent that there is a need for inexpensive yet functional day-to-day rehabilitation equipment and accompanying systems to enable such patients to re-learn limb movements. During this research, investigations into pre-existing upper limb exoskeletons were conducted and analysed allowing a decision to be made about which method best suited the aims of this project. Whilst several methods proved to be more elaborate and sophisticated, they also came with the disadvantage of increased weight and a significant increase in cost of production.

Incorporating the aforementioned investigations into thorough concept design analysis, an appropriate concept was implemented through a preliminary testing phase. Within this phase the relevant components were obtained and, in turn, attached to the physical structure in order to begin testing procedures. Upon testing, results were gathered and conclusions drawn on the success of the components and the overall system.

Upon finalising the concept, a walkthrough was provided of the system's working. Conclusions were drawn about the final concept, with future work and improvements stated. These can be undertaken by either the author or future students at the university.

Why do people engage in regular sea swimming? A qualitative research study

Anne Rowbottom
Allied Health Professions

Introduction: Occupational Science is the study of the relationship between occupation and humans and provides the scientific evidence base to inform Occupational Therapy practice. The purpose of this study is to add to this body of evidence by investigating the experience of regular cold water sea swimming. This study explores the lived experience of regular swimmers who, given other nearby options including a heated indoor pool and sea water filled lake, choose to swim in the cold, muddy, tidal waters of the Bristol Channel. It employs an empirical, qualitative, phenomenological research technique to address the hypothesis that engaging in sea swimming provides additional benefits to those associated with pool swimming.

Method: Eight individuals who identified themselves as regular sea swimmers completed semi-structured interviews answering the question 'Why do you swim in the sea'? Resulting data was transcribed from audio and analysed using thematic analysis.

Results: At the time of writing thematic analysis is underway. It can be anticipated that themes identified are likely to relate to physical and medical health benefits, personal challenge, finding a shared niche identity and social inclusion.

Discussion: Resulting themes will be discussed in relation to the hypothesis and existing academic theory. In accordance with Occupational Science practice, the form, function and meaning of the occupation will be addressed. It is anticipated that discussion may incorporate literature from, among others, the theories of positive psychology, biophilia and sensory integration. This study will add to the body of occupational science knowledge, increase understanding of the links between environment, occupation, health and wellbeing, and consider the potential implications for occupational therapy.

Isolation and characterisation of a novel bacteriophage

Aruezi Osue
Applied Sciences

Bacteriophages (phage) are referred to as the most abundant and genetically diverse group of biological organisms on earth (Clokie *et al.,* 2011), with the unique ability to lyse bacteria through the lytic or lysogenic cycle. The aim of this project was to isolate novel bacteriophages active against *Salmonella enterica serovar* dublin (*S. enterica* dublin) from environmental samples and characterise them to facilitate a greater understanding of their biology.

Environmental samples (soil and activated sludge) were tested for the presence of phages using host bacterium, *S. enterica* dublin. Phages were purified by serial dilutions to obtain a lysate of phage from one genetic clone. Following purification, phage morphology was studied under a transmission electron microscope (TEM) and purified isolates were concentrated in a centrifuge in preparation for DNA extraction. DNA extraction was performed using the PCI/SDS method. Using restriction enzymes, phage genome was digested, and gel electrophoresis performed.

The phage isolated had an isometric head with a long non-contractile tail that exhibits transverse striations. Phage was found to be inactive against *Salmonella newport*, *Salmonella typhimurium*, *Salmonella agona* and *Salmonella entertitidis*. Due to the high specificity of bacteriophages and their ability to lyse bacteria, studies into their application as antimicrobial agents are rising (Turner *et al.,* 2017). This is because of an increase in the prevalence of multidrug resistant strains of bacteria which reduces the efficacy of current antibiotics. *S. enterica* dublin is a foodborne pathogen that contaminates ruminants, poultry and swine. This provides an application of bacteriophages in the food production industry as biocontrol against foodborne pathogens.

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Turner, D., Wand, M.E., Briers, Y., Lavigne, R., Sutton, J.M. and Reynolds, D.M., (2017). Characterisation and genome sequence of the lytic *Acinetobacter baumannii* bacteriophage vB_AbaS_Loki. PloS One, 12(2), p.e0172303.

Handedness and insight problem solving

Amera Shankla
Health & Social Sciences

This study aims to gain a better understanding of potential differences in left and right-handers in their approach to and performance with ill-defined problem solving (Zhao *et al.,* 2014) using the compound remote associate task (CRA). A difference in activation and brain morphology between left and right-handed individuals has been identified (e.g., Jang *et al.,* 2017) as well as a difference in performance on problem solving tasks (Beeman & Bowden, 2000). Research into the neural correlates of ill-defined problem solving has typically

excluded data on left-handed individuals (Dietrich & Kanso, 2010). As such, it is important to include this population in research to gain a deeper understanding of how different areas of the brain may be recruited for problem solution based on handedness. It is hypothesised that left handers will perform better on the compound remote associate task in terms of speed and accuracy than right handers. It is further hypothesised that there will be increased activation in the right hemisphere of the brain in left handers compared to right handers (Dietrich & Kanso, 2010). An independent measures design will be employed with handedness as the independent variable and two dependent variables; scores on CRA task and hemispheric differences of beta and gamma activity (15-48Hz). A total of thirty participants will be used with fifteen in each condition. The data will be analysed using independent t-test comparing reaction time and accuracy between the two groups. A second analysis will be conducted to compare the hemispheric activity maps to detect differences between the two groups. It is anticipated that left-handed individuals will perform better than right-handers on compound remote associate tasks in terms of increased reaction time and accuracy due to increased connectivity across the two hemispheres.

Spatial distribution of cocoa: an indicator of an inequitable global economy

Jacob French, Julianna Muñoz, Maria Lear, Rami Ismail, Sofya Kipnis & Zaneta Kresinska
Geography & Environmental Management

Currently the uneven spatial distribution of cocoa production and consumption demonstrates uneven distribution of wealth and economic development across the world. This poster will highlight a disproportionate global economy with a distinct difference between the indicators of development including quality of life, economy and transparency of political processes between the main consumers in More Economically Developed Countries (MEDCs) and producers of cocoa in Less Economically Developed Countries (LEDCs). The poster evidences its findings through the comparative analysis of Ivory Coast and Ghana, the current largest producers of cocoa in the world. It argues that although inequality is decreasing in some locations with improvements in education, the role and contribution of non-governmental organisations and government investment, producers still suffer from problems such as slavery and economic uncertainty. Furthermore, the evidence suggests that environmental degradation caused by unregulated production of cocoa will have an irreversible negative impact on the future populations in these states. The poster concludes that cocoa production is not just the responsibility of producers, but should also bear upon the consumers. This will, in turn, improve development in producing countries.

Habitat preference, distribution modelling and threat analysis of the Visayan warty pig (*Sus cebifrons*) on the island of Negros, Philippines

Emma Bennett
Applied Sciences

The Visayan warty pig (*Sus cebifrons*) is one of the rarest and least studied pig species on earth. Despite being housed in zoos across the globe, little is known about its distribution or habitat preferences in the wild. Understanding habitat preferences for this Critically Endangered species is key to effectively allocate conservation actions and resources. In this study I provide the first assessment of population distribution and habitat preferences for *S.*

cebifrons using line transect surveys in southern Negros, Philippines. The study identified a total of 184 indirect signs of *S. cebifrons* presence including tracks, rooting, tooth marks and shelters in the Mantiquil forest. Signs were identified in a range of habitat types including lowland dipterocarp forest, degraded areas of forest and cogon (*Imperata cylindrica*) grassland. An apparent preference for cogon grassland was identified, with 19.1% of all signs found within just one transect in this habitat type. Along with line transects, camera trapping was used in an effort to estimate population abundance.

Despite proving unsuccessful in capturing footage of *S. cebifrons*, two video clips of a hunter were recorded in July 2017. Several snare traps designed to capture *S. cebifrons* were also found throughout the study site, showing that in spite of legal protection the species continues to be targeted. Despite massive declines in the remaining forest in the area, *S. cebifrons* is able to persist in degraded habitats, such as cogon grasslands, suggesting that conservation measures which target deforestation alone may not be enough. In the Mantiquil forest the primary threat to *S. cebifrons* is hunting. To target subsistence hunting, I recommend continued sustainable development and capacity building within the communities surrounding the forest to enable local people to buy food from market. To target recreational hunting, protection measures already in place must be reinforced.

Inhibition and motivation as predictors of performance on two different modalities of the Tower of London task

Gus Levinson
Health & Social Sciences

Introduction: The Tower of London Task (TOL) (Shallice, 1982) is a popular measure of planning. The present experiment investigates whether the format of the modality of the TOL affects the planning and task performance. Inhibition has been linked with performance on the TOL (Welsh, Satterlee-Cartmell & Stine, 1999). Inhibition as a predictor of task performance is investigated. Motivational differences between how participants perform on computerised or manual TOL have little or no existing literature. Therefore, a third aim is to investigate whether motivation level, specifically perfectionism, could explain any variance between computer and manual performance.

Method: Sixty participants are projected to be recruited from the University of the West of England using Participant Pool©. All participants will experience both TOL modalities (computer and manual versions) and thus a within-subjects designs will be implemented. The TOL is a problem-solving task requiring the rearrangement of three different coloured balls on pegs to the goal state within a maximum number of moves. Inhibition was measured using the Self-Regulation Questionnaire, Stroop test and Go/No-Go. The Perfectionism Inventory was given to all participants to assess an aspect of motivation.

Results: It is predicted that planning length will be longer on the manual TOL task. Consequently, it is further predicted that inhibition is a predictor of performance. Based on the scant current literature, the rationale is that levels of perfectionism will be higher for participants using manual TOL and, furthermore, those with high levels of perfectionism are expected to perform better than those with low levels.

Implications: This research is important when considering the clinical applications of TOL. If there are differences in performance due to how the modality affects motivation and inhibition then each modality may test different cognitive processes. Therefore, this could affect how the TOL is implemented in the future.

The impact of internal and external edge effects on temperate deciduous forest microclimate and species diversity

Robert Adams
Geography & Environmental Management

This research investigates the impact of internal and external edge effects on temperate deciduous forest microclimate and species diversity. In order to address the research aim, four research questions have been established: (i) Is microclimate (light, temperature, wind speed, humidity) affected by internal and external edge effects? (ii) Is species diversity (total species diversity and individual species occurrence) affected by internal and external edge effects? (iii) Are there correlations between microclimate and species diversity? (iv) Are internal edge effects weaker or stronger than external edge effects? There is little previous literature on this topic, which makes this a ground-breaking investigation. The research is important for conservation of plant species as a change in microclimate often results in the loss of the rarest species as they are least resistant to change in the environment. Field data were collected from two different forest locations (Wytham Woods and the New Forest). Microclimatic data were collected using a kestrel meter and light meter, whilst species data were collected using a quadrat. Twenty transects were taken 1m apart at every site (0-30m), with 11 points along each of the transects. Each transect followed a southerly direction into the forest. This meant that recordings at each site covered a $600m^2$ area, with approximately 6000 recordings taken in total. Preliminary results show there are clear edge effects with respect to microclimate and vegetation, created by internal footpaths and external forest edges. This is significant for forest conservation as both internal and external canopy disturbances alter abiotic and biotic variables and this needs to be understood when managing biodiversity.

Graduate enterprise routes: venturing into the Business Model Canvas

John Barker
Education & Childhood

Aims: The aim of this study is to explore the links between the use of the Business Model Canvas (BMC) and its effectiveness as a tool for entrepreneurial education in HE incubation settings. The BMC is a strategic management document for developing new or documenting existing business models.

Design and Methods: The project will be split into two distinct phases of data capture using a combination of quantitative and qualitative research. In localising the research within the University of the West of England, observational case studies will illustrate some of the challenges and successes of enterprise education and the use of the BMC to facilitate this.

Anticipated Findings: The BMC is an effective tool for tracking and enhancing entrepreneurial effectiveness (i.e. successful venture creation and business growth). The use of BMC in Higher Education enterprise education environments leads to an enhanced student experience. However, the anticipated findings of this study indicate that the BMC should be altered and adapted for delivery to the HE incubation learners.

Implications of Research: A review of the utilisation of BMC within HE entrepreneurial support programmes and development of institutionally specific BMC could be an interesting

development of this research. This could lead to enhanced venture creation and support for students, and to better graduate outcomes for the institution as a whole.

Identifying genes involved in the colonization of plants by bacterial plant pathogen *Pseudomonas syringae* pv. *pisi*

Megan Richardson
Applied Sciences

Pseudomonas syringae is a bacterial plant pathogen that has many different sub-species termed pathovars. Different pathovars exhibit distinctive pathogenicity towards a specific host. Research focusing on *P. syringae* is particularly important as it can cause diseases in a wide range of commercial crop plants resulting in a damaging effect on the economy. In 2012 a report concluded that *P. syringae* was the most important plant pathogen globally in terms of both economic and scientific impact. An example is bacterial blight of pea caused by *P. syringae* pathovar *pisi* (*Ppi*). *Ppi* can infect any pea plant anywhere in the world if given the opportunity, decreasing crop yield and limiting agricultural profits. Disease is often attributed to contaminated seeds. However, the development of the disease is highly dependent on weather conditions. *Ppi* is frequently attributed to causing serious losses in plant yields in winter-sown crops.

My research focuses on identifying genes involved in *Ppi* pathogenesis. A transposon mutant library of *Ppi* race 2 strain 203 was created providing 960 mutants with a single different gene knocked out in each mutant. Some of these could inhibit or increase *Ppi*'s ability to colonize and/or cause disease in pea. Transposon mutants were tested using *in vitro* screening methods to determine differences in colony morphology, motility and biofilm formation compared to those of the wild type. Any mutants displaying phenotypes significantly different to those of the wild type were tested further using *in vivo* methods, through artificial inoculation directly into host plants. Any mutants of interest were sequenced outwards from the transposon to identify which gene had been knocked out. Complementation tests were performed to validate that these genes are those responsible for the change in phenotype. Genes identified could be studied further, potentially providing new targets for disease control and new insights into bacterial/plant interactions.

Expression of carbonic anhydrase IX and hypoxia induced factor - 1α in breast cancer and its comparison with fatty acid binding protein-7 biomarker

Uzoma Uzochukwu
Applied Sciences

Breast cancer is the most common type of cancer among women and the second leading cause of cancer death among women in the United Kingdom. It is a heterogeneous disease because of its wide range of morphological features and diverse clinical outcomes, requiring various treatments for different patients. Hence, there are several criteria for breast cancer classification based on their biological and molecular features. Breast cancers over-express certain proteins such as carbonic anhydrase IX (CAIX) and hypoxia induced factor - 1α (HIF-1α) in response to lack of oxygen; they can be detected using a technique known as immunohistochemistry. The aim of this study was to investigate whether breast cancer can be further classified using expression of CAIX and HIF -1α.

A cohort of breast cancer tissue with full ethical approval was stained using immunohistochemistry. The quantity and intensity of the stain was assessed using defined scoring methods and the scores were compared with patients' clinical features (age, tumour stage, tumour size, histologic grade and lymph nodes) and fatty acid binding protein (FABP) - 7 another protein expressed by breast cancer cells. The results showed that CAIX was associated with lymph node positivity; FABP-7 and HIF-1α were both associated with molecular subtypes while HIF-1α also showed association with tumour size. Lymph nodes and tumour size are features useful in predicting prognosis. As such, the study suggested potential prognostic benefit of CAIX, HIF-1α and FABP7 biomarkers which are useful in targeted therapies especially for triple negative breast cancer subtypes which are not fully understood.

Measuring the cytotoxic and genotoxic effects of Carmustine and Melphalan on cell line TK6

Tiffany Cordier
Applied Sciences

The disease of interest in this study is leukaemia, which is a devastating malignancy caused by the mass production of lymphoblasts in the body's bone marrow. Leukaemia is predominately treated with chemotherapy, which is a debilitating treatment, and in most cases also has a long-lasting carcinogenic effect on the patient's own somatic cells, causing malignancies in the future. Therefore, the study of the chemotherapeutic agents administered to patients during chemotherapy treatment is of vital importance, as it needs to be observed to what extent these can be causing damage to the patient's healthy somatic cells. Two bifunctional alkylating agents that are used in chemotherapy treatment are Melphalan (MEL) and Carmustine (BCNU). They are the chosen chemotherapeutic agents in this study. MEL and BCNU work by causing interstrand crosslink formations, by attaching an Alkyl group to a Guanine base, producing O6-alkylguanine. This cross-linkage causes cytotoxicity as the DNA within these cells cannot function, as the DNA has been misaligned. However, this genotoxic damage can be fixed by nucleotide excision repair and recombination. This is achieved by O6-alkylguanine being removed by O6-methylguanine-DNA methyltransferase (MGMT), thus fixing the base lesion. Through a series of assays, the cytotoxic and genotoxic effects of MEL and BCNU can be measured. Also, observations can be made of how TK6 cells, which are competent p53, can regulate and produce MGMT effectivity in repairing damaged cells. Preliminary findings, through the use of statistical analysis of my genotoxic and cytotoxic assays, correlate with previous literature and highlight that these agents can cause cell death and DNA damage. However, due to experimental limitations, some data show inaccuracies.

Evaluating predictive measures of language dominance in epilepsy patient data

Bertie Scott
Psychology

Aim: As part of a larger project being conducted at the Rosa burden centre, Southmead, this research evaluates the ability of clinicians to establish which hemisphere a patient has language dominance.

Background: Most of the current literature establishes that patients who have developed epilepsy during their developmental years will have a higher chance of possessing atypical

language dominance (Springer *et al.,* 1999). This is due a phenomenon called neuroplasticity. This is the capacity of the brain to change neural networks in response to damage or dysfunction, predominantly during early years (Cramer *et al.,* 2011). Neuroplasticity predominantly occurs during the formative years, but there are differing views on the age at which language re-organisation becomes less likely. Relevant factors include presence of hippocampal sclerosis, age of seizure onset, duration of epilepsy and handedness (Hamberger and Cole 2011). This study will add to the current literature, looking at the effect of the age of onset and the duration of epilepsy on language reorganisation.

Methods: Our population is sampled from the Bristol Epilepsy Surgery Programme at Southmead hospital, from patients enrolled from 2013 onwards. This data has already been collected as part of routine clinical practice and will be provided by a clinician. We will perform a binomial logistic to see what variables can be used to predict the hemisphere of language dominance and to identify if there is any interaction effect between our variables.

Expected results and implications: We predict that there will be a correlation between left hemisphere patients (with early diagnosis) and atypical (right) language representation. It is imperative for surgical candidates that the location of their language dominance has been identified as left, right or, in some cases, bilateral. This is so the patient and surgeons understand the risk of significant cognitive decline as a result of neurosurgery.

A comparison of the antibacterial effects of five essential oils against two species of bacteria

Shenikh Qadir
Applied Sciences

The aim of this study was to identify and compare the antibacterial effects of five essential oils (EOs) against the bacterial species *Staphylococcus aureus* ATCC 6358 and *Staphylococcus epidermidis* NCIMB 12721. Antimicrobial susceptibility screening was performed using the disk diffusion method. Both bacterial species showed susceptibility to tea tree, lavender, cinnamon and lemongrass EOs, with no observed susceptibility to grapeseed EO. Lemongrass EO showed the largest zones of inhibition for both species and cinnamon and tea tree EOs followed behind. Notably, the strain of *S. aureus* tested, showed the presence of visible colonies inside the zones of inhibition when tested against tea tree and lavender EOs. The antiseptic (TCP) was also tested using the same methodology to compare its antibacterial effect with the EOs. Both species showed very little susceptibility to the TCP with only small zones of inhibition. Lemongrass and cinnamon EO were tested further to determine their minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC). The microtitre plate method was adopted to obtain the MICs for both EOs, and a spot inoculation was performed to determine the MBCs. A time-kill assay was performed to determine the time points at which the EOs exhibited a bactericidal effect. In all instances, lemongrass oil showed a faster kill rate in comparison to cinnamon oil. Both bacterial species had samples taken, untreated and treated with lemongrass and cinnamon EOs separately which were prepared for scanning electron microscope (SEM) imaging, to give a visual representation of the differences the bacterial cells undergo when treated with the EOs. Finally, a mannitol salt agar medium was inoculated with both bacterial species as a confirmatory testing method identifying the respective bacterial species. In conclusion, lemongrass EO showed the greatest antibacterial effect in comparison to the four other EOs tested.

An investigation into school readiness: a year one perspective

Laura Bratley
Education & Childhood

The issue of school readiness has long been a topic of contention between stakeholders, with everyone from early years practitioners and teachers to Ofsted and parents having an opinion on the 'best age' to begin formal schooling. I am particularly interested in this area as I have chosen Early Years as my subject specialism, therefore I am interested in finding out more about the area in order to support my practice in future years. According to the 'Are You Ready - Good Practice in School Readiness' report (Ofsted, 2014), there is no clear definition of 'school readiness' or whether that term should be attributed to children starting reception or year one. I have therefore decided to focus my dissertation research on school readiness within a small year one classroom, which has both winter and summer-born children, children with older siblings, and children who have attended the on-site nursery, in order to give me a representative set of data, using mixed methods to reinforce reliability. Within this focus, I will consider what is meant by 'school readiness', what age children are ready for school, and who should decide when a child is ready. I will also be considering summer-born children as literature suggests that this can be a factor in lower attainment generally and it would be interesting to identify any correlation with school readiness. I will identify what strategies are used to support children as they begin school and as they move from Foundation to Key Stage 1, including stay and play sessions, home visits, parent information meetings, staggered starts and half-days.

Monitoring the impact of local water management practices from space

Callum Lance Foster
Geography & Environmental Management

With increasing global population and a changing climate, water security is and will remain a pervasive challenge, particularly in the global south (Davies, Everard & Horswell, 2016). Overuse of water sources is an ongoing issue, with estimates suggesting that two-thirds of the global population will be living in water-stressed conditions by 2025 (USAID, 2015; United Nations, 2015). Consequently, water is an underpinning focus for a number of UN Sustainable Development Goals (United Nations, 2015). This crisis is happening today not only in less developed economies but also in the developing and developed worlds. Cape Town, South Africa is facing severe water stress issues after failing to implement mitigation strategies following a three-year drought. Local news sources are reporting that reservoirs are nearing the critical 13.5% percent capacity level where supply will be switched off, locally known as 'Day Zero'. The drought has impacts on key sectors such as tourism, with both international and domestic travellers cancelling trips owing to the uncertainty of available water following Day Zero (eNCA, 2018).

Many states in India suffer severe water shortages owing to the uneven distribution of rains across the country (Rodell *et al.,* 2009). Groundwater plays a significant role in India's economy and water resource access. However, this has led to issues surrounding the overexploitation of groundwater, including the depletion of water tables, salinisation and increased vulnerability of groundwater pollution (Postel, 2015).

The Sentinel-2 satellites, belonging to the Copernicus project by the European Space Agency, allow for earth observation techniques to be applied with previously unparalleled

detail. This study will assess whether the advancements in satellite technology as demonstrated by Sentinel-2 can be used to inform community-based groundwater recharge initiatives, leading to a more secure water future for all.

The effects of flavoured chewing gum on cognitive function and mood

Charlee Humphries
Health and Social Sciences

This study investigates the effects of flavoured chewing gum on cognitive functioning and mood. Chewing gum is very popular and there is evidence to show it is linked to improvements in cognitive performance. This study aims to explore this effect further. It was hypothesised that chewing gum will improve cognitive functioning and that mint flavour will cause a bigger increase. This study used a within-subjects design with three levels (no gum, mint flavoured gum and fruit flavoured gum). Thirty-two self-reported healthy undergraduate psychology students participated in the study. All subjects completed a series of standard performance measures under each of the three conditions. The measures covered reaction time, vigilance and inhibitory response. Mood ratings were also taken throughout to assess any changes that may have occurred as the result of the manipulations. A series of ANOVAs will be conducted to assess the impact of chewing gum flavour on performance. It is expected that the results will show the average reaction time for all tests will be quickest for the mint flavoured gum compared to fruit or no gum. It also expected that mood will remain consistent throughout so there will be no independent effect on performance. It is expected that data will show that chewing gum leads to an increase in attention and the biggest increase is with mint flavoured gum. This has implications for aiding attention in the real world, including education/higher education and the workplace where there are heavy demands placed upon individuals.

Syria: the destruction of ancient architecture and the loss of the nation's identity

Marya Shnoudi
Architecture and the Built Environment

This research explored the architectural history of Syria and how it manifests itself in the shaping of a unique Syrian identity. The research identified a number of historical sites in Syria and highlighted how the construction of these sites marked a shift towards a different type of architecture throughout the different eras and civilizations which inhabited Syria historically. These included Roman, Byzantine, the Islamic/Ottoman period and the French Colonial period. The research also attempted to explore how restoration efforts in Syria after conflict ends can be shaped, highlighting the fact that different groups are making claims to Syrian regions. The research concluded by comparing the findings with restoration efforts in other post-war regions.

The epidemiology of diagnosing cervical cancer and the importance of early detection through cervical screening

Sionedd Lee
Nursing & Midwifery

In the United Kingdom, 3000 women are diagnosed with cervical cancer each year, mainly sexually active women between the ages of 30 to 45 (NHS Choices UK, 2015). Cell changes in the cervix can be detected at an early stage and treatment can reduce the risk of cervical cancer developing (NHS Choices UK, 2015). Human papillomavirus (HPV) infection is the leading avoidable risk factor for cervical cancer and anyone who is sexually active can be infected with the virus. However, figures show one in four women invited for cervical screening are not screened (gov.uk, 2017). Cervical screening prevents 75% of cervical cancers, and the procedure lasts for less than ten minutes on average (Berry, 2017). The NHS offers a cervical screening programme to all women from the age of 25, where a small sample of cells is taken from the cervix and examined under a microscope for abnormalities (NHS Choices UK, 2015). Women registered with a GP practice aged 25 to 49 are invited for screening more often, every three years while those aged 50 to 64 are invited every five years (Berry, 2017). Subsequently, following the success of the NHS Cervical Screening Programme, data has shown that the number of cervical cancer cases in the UK has decreased (NHS Choices UK, 2015). Overall, 3.18 million women aged 25 to 64 years were tested in 2016-17, an increase of almost 3 per cent from 2015-16 when 3.09 million women were tested. Cervical cell samples are submitted by General Practices and NHS Community Clinics, and nearly 95 per cent of test results were returned negative in 2016-2017 (gov.uk).

NHS Choices UK (2015) Cervical Cancer [online]. Leeds: NHS. Available from: https://www.nhs.uk/conditions/cervical-cancer/ [Accessed 5 December 2017]. Berry, L. (2017) Cervical Cancer. Nursing Standard [online]. 31(21), pp.15. [Accessed 10 December 2017].
Gov.uk (2017) Cervical Screening Programme England 2016-2017 [online]. England: NHS Digital. Available from: https://www.gov.uk/government/statistics/cervical-screening-programme-england-2016-17 [Accessed 5 December 2017].

A critical analysis of law and morality

Freya Sinclair
Bristol Law School

There have been many debates over the relationship between law and morality. H.L.A. Hart and Lord Devlin both published their sides of the argument after the release of the Wolfenden Report in 1957. Sixty years later, the debate can be brought into a wide variety of 21st century topics. This research will adopt socio-legal methodology to assess how the law interacts with society's morals and whether they reflect one another. The methodology allows the ability to assess how the law is applied to society and how it is used in everyday life. The methodology also enables discussion of whether the law is achieving the aims and objectives set by Government. With moral arguments from many different groups and perspectives, this paper will evaluate these topics from the view of religion, feminism and subjectivism. Preimplantation genetic diagnosis, prostitution and the right to die are subjects in which moral and legal debate may never be concluded. We need to ask questions such as: when should the law overstep a scientific judgment? Should the law be involved in an individual's private interactions? Should a judge decide whether an individual can consent to not receiving treatment? It seems like an effective idea for the laws of the UK to reflect the morals of its citizens. However, due to various religions, cultures and lifestyles it would be an arduous task to mirror the moral ground of every individual. In contrast, if the laws of nations were to change in a certain area, this may then mould the thinking of its citizens.

Did institutions of East Germany between 1945 and 1960 use a construction of the Nazi past to indoctrinate children into becoming 'perfect' Communist antifascists?

Katy Butt
Arts and Cultural Industries

One global preoccupation in the world currently is the manipulation and indoctrination of youth for participation in authoritarian regimes and political violence. This is not a new problem. Analysing similar cases going back to the 1930s, which were based in part on modern communication processes and networks, can help us to understand and explain the dangers.

Historical studies of Nazi Germany are legion. They span many decades and approaches and include examination of the Hitler Youth (HJ). The chaotic events after 1945 and the legacy of the HJ on the citizens of East Germany – a new dictatorship – have, however, rarely been researched. My study aims to shed light on the scarcely investigated youth policies of the GDR and seeks to find out how a generation of children and adolescents, brought up under a fascist dictatorship, came to be controlled by a communist one.

Through the use of media of mass communication (including photographs, school text books, newspaper reports, and propaganda posters), as well as official documents and personal testimonies, I will reflect upon the ways youthful memories of the Nazi dictatorship were capitalised upon by the government of East Germany.

After 1945, the occupying Soviet regime and, later, the Socialist Unity Party, poured time and resources into creating the perfect anti-fascist socialist. Through groups such as the Freie Deutsche Jugend, children engaged with activities that were set to politicize them. Schools were seen as one of the main instruments in raising this new generation: curricula and teaching staff were regularly 'purged'. New, 'untainted', teachers set tasks aimed at criticising the past, including projects about students' own families. Through education and propaganda, soldiers returning home were depicted as anti-fascist heroes and victims of the capitalist Nazi state, reinforcing young people's sense of a deep grievance against the capitalist West.

Adding value: an inclusive approach to an undergraduate pro-bono activity

Lindsay Walker & Tish Whitehurst
Bristol Law School

In September 2017, a project was launched at the University of the West of England (UWE) to provide UK law student support for prisoners and their law tutors in East Africa studying as part of the University of London external Bachelor of Laws (LLB) programme. This addition to UWE's well-established pro-bono programme had two aims: to provide students and tutors with access to legal resources; and to thereby develop the legal library skills of Level 1 UWE students. From the outset of the project, inclusivity and student leadership were the key tenets. The staff leaders broke away from selecting high-performing Level 2 and 3 students for their pro-bono work, which favours students with prior experience and social capital. Supporting an inclusive programme in East Africa needed to be matched by the university's own commitment to inclusivity and to meaningfully 'add value' to all our

students' outcomes. 'Marketing' of the programme was intentionally focussed on Level 1 students with a clear message communicated of 'open to all'. The selection has been based on willingness and commitment to try. For this to work and to ensure that the 20 Level 1 students can acquire the requisite skills to carry out the tasks they are led by six Level 2/3 law students. This leads to the development not just of core law research skills but of marketable soft skills such as teamwork, leadership, time management, written and oral communication and enterprise. Students have been trusted to both create the outcomes of the project and to define the direction in which the project will eventually go. This all occurs in a space where students are treated as equals and staff supporters are merely there to facilitate a communication framework between different subgroups of the project and provide mentorship and skills development where students feel they need this.

Designing expressive user interfaces for interactive music technology

Ed Fry
Computer Science & Creative Technologies

As music technology has progressed over the last two decades, user workflow has increasingly become 'in the box' (computer), with many digital audio workstations (recording software) leading the way for music-making. Software applications such as Ableton Live have broken the mould by allowing musicians to think differently using technology. As this has happened, the physical tasks that music creators undertake, using a mouse and keyboard and often keyboard MIDI (Musical Instrument Digital Interface) controller, have remained the same regardless of the techniques employed or the expression being conveyed. However, users still want to express themselves in a tactile way (Loftus and Mayes-Wright, 2016).

This project aims to develop an expressive MIDI controller based on the theories behind Human-Computer Interaction, interaction design and their applicability to music technology. As digital music interaction homogenises with computers and starts to replace GUIs (Graphical User Interfaces), the science of interaction design moves towards creating user experiences that enhance and extend the way people work, communicate and interact (Sharp, Rogers and Preece, 2002). This can assist in developing interfaces for expressive musical creation. Using the theories studied in the research phase, an expressive MIDI interface has been designed and developed using sensor technology and Arduino microcontroller hardware. This process has been undertaken iteratively by user-testing, developing the MIDI interface and improving its features and expressiveness. The user-testing has been formulated and carried out using a mixed method testing approach, based on research into usability, stakeholder profiling, heuristics and industry inquiry with regards to trends in user experience testing. The ultimate goal is to critically choose the most relevant techniques and theories for the development of expressive music technology for modern electronic musicians.

Loftus, J & Mayes-Wright, C. (2016) Novation Music. Available from: https://us.novationmusic.com/community/news/if-we-build-it-they-will-come [Accessed 12 October 2017].
Sharp, H., Rogers, Y. and Preece, H. (2002) Interaction Design: Beyond Human-computer Interaction. 3rd ed. New York: John Wiley & Sons Inc.

Bristol Bike: developing a mobile app to encourage regular exercise

Adam Charvat, Francis Desmind, Filip Zukowski, Ethan Venencia & Alexander Good
Computer Science & Creative Technologies

'Bristol Bike' is a mobile application proposal, combining cycling with GPS-based technological possibilities and gaming elements, which aims to encourage regular activity. It is aimed not only at promoting cycling, but also reducing emissions, educating users about cycling safety and maintenance techniques, encouraging more people to use their bikes as a preferred transport method, and bringing a completely new perspective to cycling by adding our unique gaming techniques. Such elements include levels, experience points, daily or weekly challenges, badges and competitions. This proposal to Bristol City Council would allow us to endorse our app and spread awareness throughout Bristol for what our city has to offer, from its landmarks, sights, points of interest and local businesses, using fun and progressive gamified elements that encourage our users to visit these various locations, receiving points and redeemable incentives in doing so.

Despite vast improvements in cycling infrastructure in many cities across the UK, the majority of citizens still don't cycle to work, to school or to the shops, etc. and cycling is very much a marginal form of transport. Our research draws attention to the fact that in 2015, 15% of the population cycle at least once per month (ONS). This figure is considerably lower than we expected and we thought about solutions to raise this percentage. Our team looked at current initiatives put in place to promote cycling. We studied various cycling apps and schemes focusing on their strengths and how we could go about improving them with a new gamified approach.

The application of game design methods to create educational-centred serious games

Harry Davies
Computer Science & Creative Technologies

The focus of this work is the application of game design techniques for the purpose of creating an educational experience capable of significantly improving a player's knowledge through interactions with the game alone. Throughout the research the strengths and weaknesses of the methodology were explored, to formulate a concise list of standard practices that should be deployed when developing any serious game regardless of topic. The technical aspect of the project focused on the creation of game development tools and a testing environment. The intent was to perform preliminary testing of existing game design methods and to test target audience responses to these methods. This work was completed in conjunction with a serious game project with the purpose of informing users about their individual responsibility in working towards a sustainable future structured around the UN's 2015 Sustainable Development Goals (SDGs). SDGs are part of a fifteen-year plan designed to create a sustainable world for people of all cultures and backgrounds. The research undertaken will be used as the backbone for the design process beyond the game's prototype stage, acting as a platform to promote the project for future funding.

Manufacturing a small, thin, flexible wing for a dragonfly-like Micro Aerial Vehicle (MAV)

Jie Ooi
Engineering, Design & Mathematics

Micro Aerial Vehicles (MAV) are more responsive and significantly smaller than Unmanned Aerial Vehicles (UAV), although they are based on similar technologies. A dragonfly is the most agile insect in the world and by implementing its characteristics into a MAV, it will be able to navigate harsh conditions swiftly. This research considers the best choice of materials and the manufacturing methods for producing a small, thin and flexible wing for a dragonfly-like MAV. The study uses the main characteristics of a dragonfly wing as a reference for the wing design. An analysis of different possible manufacturing methods for the wing is carried out and the foremost manufacturing method to investigate is Rapid Prototyping - the simplest and most waste-reducing way to fabricate a product. Numerous tests of the manufactured wing prototypes will be performed to compare with the characteristics of a real dragonfly wing. The research is expected to find the most suitable wing for the MAV by comparing the test data. Moreover, the wing is expected to be a multi-material and variable thickness wing, possessing the characteristics of stiffness and flexibility. The most suitable manufacturing method for the wing for wider production will be investigated. Furthermore, possible improvements in fabricating the wing will be considered for future work, where resources might be less limited.

Creating an Aids-free future: getting to zero by 2030

Michalis Pantelidi
Art & Design

The aim of this design brief was to raise awareness of the Elton John Aids Foundation by developing a range of digitally printed jersey and woven garments in collaboration with the Foundation and the British department store, John Lewis. The print artworks, inspired by 'The Times' newspaper layout and typeface, reflect the values, traditions and character of the truly British heritage department store. The monochromatic colour palette enables the message to be conveyed in a direct way, with red emphasising key words. The non-gendered collection conveys the message that HIV has no gender bias and highlights the story of American teenager Ryan White, who was refused entry to school following an HIV diagnosis. The final designs are presented on a series of large format sheets that echo the pages of a newspaper. They were shortlisted for industry feedback.

Learning beyond the university curriculum via student competitions: A case study of UWE Formula Student

Christian Martin, Nicholas Kimber, Jacob Hatherell, Robert McGregor, Kieran Dennington, Anthony Kepple, Andrew Geddes, Lester James, Magnus Chapman, Richard Clark, Cory Richards & Jason Matthews
Engineering, Design & Mathematics

Background: Formula Student is a global competition supported by the Institution of Mechanical Engineers, and is held annually at Silverstone race circuit in the UK. Student teams design, build, test and race an open wheel racing car. The cars are judged on a series of static and dynamic criteria. Universities and higher education colleges use the competition to enhance the student experience and complement taught educational materials. The

competition reinforces the use of fundamental engineering science, mathematics and physics in engineering design, computational analysis and manufacturing technology.

Aim: The objective was to investigate the benefits beyond the prescribed engineering teaching that engagement with the competition provided students.

Method: Evidence was drawn from alumni and current competitors from UWE via informal interviews and reference to published material on comparable student engineering competitions.

Results: Five years of Class 1 entry has highlighted a raft of benefits that UWE students gain via their engagement. Firstly, it greatly improves the students' CVs or portfolios and is looked upon highly by employers across many industries. This is demonstrated by the success rates of team members in getting interviews, and gaining placements and employment in comparison with their peers. Secondly, it has stimulated learning within the student body via collaboration within sub-teams. The need for computer-aided design and analysis skills in freshers has meant team members have developed formal peer assisted learning programmes to support new students. Many of these team members have gone on to support the main curriculum as assistant lectures for foundation degree laboratories. Thirdly, it develops an appreciation of the need for economic judgement and provision of effective documentation in engineering projects. And finally, it provides an alternative learning process for students from non-standard backgrounds, vocationally and internationally. These findings align with observations presented in peer reviewed materials of other competitions.

Can the space we live within show a history?

Eva Ashford
Art & Design

Within the space we occupy the remains of history can linger like a scar. It ages like on the body. Analysing the way slave trade name branding within Bristol can affect the public, time and space can be presented as dynamic and inter-relational. This research will adopt theory to analyse issues arising from the remains of slave trade within Bristol. Using both Heidegger and Foucault, a comparison will be made to analyse the artwork of Rachael Whiteread in order to examine how time and space within the world and the objects we create in it can demonstrate history. This research will also offer an insight into how we can present development for the future.

Use of transposon libraries to identify genes involved in *Pseudomonas syringae* pv. tomato DC3000 plant colonization

Connor Simpson
Applied Sciences

Pathogens of important food crops are of high interest in the current climate of global food shortage. Loss of crop yields due to bacterial disease impacts businesses, individual farmers and the wider global food economy. One such pathogen is *Pseudomonas syringae*, a highly researched model organism for plant-pathogen interactions. *P. syringae* has many variants (pathovars) that are the cause of disease in a wide range of plant species including commercial crops. *P. syringae* causes blight, bacterial cankers and other symptoms which can decimate entire crops.

In this project, mutant libraries of *P. syringae* pathovar tomato (Pto DC3000) will be generated. Each mutant will contain a random insertion of the mini-transposon IS-Ω-Km/hah containing a Kanamycin resistance gene, obtained via bi-parental mating of Pto DC3000 with *E. coli* S17-1 (IS-Ω-Km/hah) which contains the transposon.

These mutant libraries will then be screened for colony morphology, swarming motility and biofilm attachment, characteristics that are key in host colonisation. Any colonies producing results of interest, such as diminished size or motility, will then be isolated for further testing and the insertion points of the transposon identified via DNA sequencing, thus identifying the gene knocked out. This process identifies genes that may be key in the plant colonisation process without the need for live plant inoculation, vastly increasing the rate that genes are identified compared to more traditional methods.

By identifying the key genes involved in the mechanism of plant colonization and virulence, more can be understood about these complex processes. Using this information new measures could be developed to prevent disease and increase food crop yields, something that is increasingly important in a world with a growing population.

Verbal Paper Session B

Stream 8:

Tuberculosis through the ages: the problem with antibiotics

Nikki Green
Applied Sciences

Tuberculosis (TB), caused by the bacterium *Mycobacterium tuberculosis* (Mtb), is a disease that strikes fear into the heart of man. This is no surprise given that, according to the World Health Organisation, of the top ten causes of deaths, TB is ninth and the only infectious disease to make the list. Part of the problem of TB is the rise of drug-resistant strains. But how did these strains occur? To answer this question, one must look to the past. In recent years, technology has improved significantly, allowing molecular exploration of ancient diseases. The earliest molecular evidence is from an extinct bison species 17,000 years ago, while the earliest human evidence is from approximately 9,000 years ago. Slowly, with the introduction of agriculture, the amount of skeletal and written evidence increases until a peak is reached in the late 1800s. Levels of TB then begin to decrease, following stricter public health measures, plummeting after the 1943 introduction of antibiotics. The first TB antibiotics were so effective that some scientists believed that TB would eventually be eradicated. However, it took Mtb less than five years to become resistant to the first antibiotic. Evidence shows that it has never taken TB long to gain resistance to antibiotics. As such, this presentation will explore the question of whether we have become too dependent on TB antibiotics, whether resistance is a human-induced issue, and whether our use of antibiotics is causing TB to evolve quicker than in the past.

Does your second language affect your native conceptualisations of verbs - the case of Romanian deschide (to open): a psycho-linguistic study

Tessa-Louise Duell
Arts & Cultural Industries

When we want to activate a light switch in English, we say 'turn on' or 'switch on' the light. However, in Romanian, they say 'deschide lumina', which directly translates to 'open the light'. The same goes for turn on the television (deschide televizorul), switch on the kettle (deschide fierbatorul) and other electronic devices including the radiator and radio. So, if native English speakers think about activating a light as turning on or flicking a switch, then do native Romanians think about it as a physical opening of light? Intrigued, I have combined research interests in bilingualism and linguistic relativity (the idea that language shapes your perception). Therefore, this research aims to test the effect of conceptual priming on judgments of grammar. Priming means exposing participants to a stimulus and activating a concept in memory, which is then given more prominence in following judgment tasks. For this experiment, I will present PowerPoint slides to bilingual Romanian-English speakers, each one consisting of an animated image or GIF. Then they will be shown a sentence in English and asked to judge if it is a good sentence, verbalising their answers. It will be interesting to discover the effect of English on native Romanian speakers' judgments and I anticipate that their judgments will be mostly accurate. However, questions about the mental processes involved in this task still remain and could be subject to further research

enquiry, with possible measurements for time taken to decide and the use of monolingual participants for comparative insight. Ultimately, I hope to rouse scholarly interest in the language representations of bilinguals, particularly those speaking understudied languages such as Romanian, to better understand the bilingual mind.

From Malaysia to the United Kingdom: personally embracing the process of change

Jen Sning Cheong
Bristol Business School

The purpose of this presentation is to demonstrate and analyse how I feel internally throughout the process of change, followed by ways to overcome uncertainty. Six months before I moved to the UK, I was diagnosed with depression and anxiety. Since I was 18, I have known that I have a low negativity capability and also low tolerance of ambiguity. I also have problems coping with disorder, complexity and chaos of 'unknowns' (Kübler-Ross & Byock, 1969). In July 2017, I was extremely happy as I got my official letter of acceptance to study at the University of West of England. However, my joy was short-lived as the next thing I knew I was drowning in unknown situations. I was afraid that I would not adapt well to life in the United Kingdom, a country 13 hours from home. The sense of incompetence, the uncertainty about how to deal with the change of study and living environments caused me to have a break down (Cameron & Green, 2015). International students, in particular, may struggle getting used to the independence that university brings. Coming from an Asian Country, I grew up with a different culture and beliefs compared to locals in the UK. Adapting to life in the UK was tough, but I learnt how to never give up and keep striving for success. I would not be who I am today without the guidance and help from my tutors. When I graduate from UWE, I believe the spirit of perseverance will follow me for a long way. I will tell everyone 'even if you have depression and anxiety, even if English is not your mother tongue, even if you have to move 13 hours away from home, with the help of dedicated university staff and your own perseverance, you can achieve great things'. I may not be the best in the world, but through this experience, I have definitely developed the best version of myself.

How the unyielding identity of the Black Panther Party was a major contributor to its downfall

Zaleta Kasenzi
Health & Social Sciences

Identity is everything when it comes to how we operate in society. It defines how we are viewed and are treated by others and, in turn, how we react to this. Social movements are no exception to this as they have an identity that they create, a collective identity which governs how much and what kind of support they receive. The Black Panther Party (BPP) was active in the United States from the mid-1960s, founded to challenge police brutality in Oakland, California. The BPP was a unique social movement as they presented an unyielding, bold and militant identity when it came to dealing with issues of racism and anti-capitalism. This caused them to gain major support and admiration, but it also had a major part to play in their demise. This case study looks at the key factors of the BPP's identity and why these factors made them a target for the FBI with reference to the social context that the BPP operated in, the history that led to their formation and to relevant theory that offers further explanation into understanding this concept.

Stream 9:

Beyond black flags: how linguistics and narrative can provide an effective model for the strategic culture analysis of DAESH

James Brackenbury
Health & Social Sciences

Strategic culture analysis is a Security Studies practice with disciplinary roots in International Relations. Developed during the Cold War to improve understanding and predicting USSR policy, strategic culture analysis traditionally uses three questions or 'assumptions' to develop an understanding of the actor in question and then plot their position on a graph. The limitation of this approach is that by only inputting imprecise data based off crude assumptions, the results are necessarily inaccurate and unscientific. Using Johnston and his three assumptions model as a base, I will further develop the approach through the lens of linguistic determinism, building on the work of narrative scholars such as Ochs and Polkinghorne, to explore the actions and rationale of Daesh (the Islamic State terrorist organisation also known as ISIS, IS or ISIL) through their own constructed narratives. In so doing, it is my belief that the standard strategic culture analysis model may be enhanced to consider the roots of culture and national mythology and the vocabulary used to construct it, thus providing a deeper understanding of the actor in question and allowing for more accurate anticipation of policy pursued in the name of strategic objectives.

An investigation into the use of V-Tails on a delta wing configuration at supersonic speeds

Dean Smith
Engineering, Design & Mathematics

In modern day war stealth is a key factor for establishing air superiority. As stated by the online dictionary Merriam Webster (2017) stealth is 'an aircraft-design characteristic consisting of oblique angular construction and avoidance of vertical surfaces that is intended to produce a very weak radar return'. Over the last few decades aircraft such as the F22 and F117 have been designed with the purpose of being stealthy to establish air dominance. During the early 1990s the US Air Force/US Navy conducted research into tailless fighter aircraft. A land based delta wing configuration was tested for the purpose of the US Air Force, ICE 101, whilst a canard delta platform was investigated for the US Navy, ICE 201. (Dorsett & Mehl, 1996). Both aircraft were designed as single-engine, multi-role fighter air-craft. The tailless aircraft where chosen due to their low radar signature, hence they were designed to be able to avoid enemy radar detection. The primary aim of this investigation is to look into using V-Tails as a method of increasing the static stability of the 101 wing configuration. Aircraft such as the F117 night hawk and YF23 air-craft have used V-Tails successfully in the past. The V-Tail was chosen due to its angular shape and hence its ability to maintain a low radar signature. Analyses will be carried out using a V-Tail on the ICE 101 flying at a supersonic speed. Currently the investigation is in its preliminary stages, but computational fluid dynamics will be used to investigate the effects different V-Tail configurations will have on the aircraft.

Dorsett, K. & Mehl, D. (1996) Innovative Control Effectors. 1st edition. Wright-Patterson AFB OH: Lockheed Martin Tactical Aircraft Systems. [Accessed 13 November 2017].
Merriam Webster (2017) Stealth. [online] Available at: https://www.merriam-webster.com/dictionary/stealth. [Accessed 14 November 2017].

How the caste system contributes to the exploitation of Dalit women within the textile industry - A study of South India

Maherush Khan
Health & Social Sciences

I have chosen to study the caste system in India, as it is deeply ingrained in social and political life. This system of hierarchy of social status is based on the lower caste (Dalits) and upper caste (Brahmins/priests). Casteism is an important area of study, impacting an individual's life in terms of their occupation, inter-marriage, education etc. Inevitably, this dictates the social class of Dalits. Due to the low paid and manual occupations and lack of access to education, they are often stuck in a vicious cycle of poverty, and are therefore vulnerable to discrimination and violence. For my dissertation I am exploring the discrimination and violence Dalit women face within the textile factories. It is important to study the experiences of Dalit women because they carry the burden of caste discrimination and poverty and, being women in a heavily patriarchal society, it puts a triple burden on them. I will explore the struggles Dalit women face in the context of their experience in textile factories and mills in South India. The methodology I will use is desk based, consisting of literature reviews and analysing the perspectives of academics who have studied this field of work. In this presentation I will show the implications of the caste system on the lives of Dalit women and how it effects their employment in these factories and mills. I hope my findings expose the injustice and violence Dalit women face not solely due to poverty, but due to the grave implications of caste that restrict them from breaking the poverty cycle.

No, we're not sick perverts! An analysis of an anti-LGBT+ discourse in Poland

Patryk Janus
Health & Social Sciences

A political debate on rights of LGBT+ people in Poland is centred around moral arguments. Politicians who reject postulates formulated by non-heteronormative groups often do so on the grounds of 'moral values' which, according to them, are in line with the country's Catholic tradition. These politicians, who use the 'moral values' argument, resort to a language full of contempt, insult, distortion and misinformation. Their comments, far from Catholic ideals of benevolence and mercy (Luke 6: 27-42), create and/or reinforce harmful stereotypes as well as incite aversion and violence towards LGBT+ individuals. In turn, the LGBT+ community cannot feel safe and, therefore, an issue of an anti-LGBT+ discourse becomes a security issue. In this presentation, I analyse security of a non-heteronormative minority within a Critical Security Studies framework.

Right-wing parties with an anti-LGBT+ agenda have dominated the Polish political scene in the past decades and in 2015 formed a coalition government. I first focus on comments made by a number of politicians from these Christian democracy political parties during Parliamentary and television debates as well as interviews. I have chosen to focus on these parties' politicians' statements because they have played a great part in creating a public discourse on perception of LGBT+ people. In the second part, I explore reports and surveys published by both Polish and international organisations on the socio-political situation of LGBT+ individuals. They confirm that most members of the Polish LGBT+ community feel insecure and/or threatened. It suggests that there is a pressing need of shift in the rhetoric, let alone legislative changes and an introduction of other provisions.

Stream 10:

What are the benefits, limitations and potential of The OT Hub for occupational therapy? Evaluating a new online platform for the profession

James Grant
Allied Health Professions

Advances in technology have expanded communication potential, changing the occupational experiences, roles and skills of society. Innovation and enterprise are central to securing the transformation and improvement of healthcare services (NHS England, 2015). The student researcher has identified a need for the open sharing of ideas and resources within the occupational therapy community. He highlights a further need for occupational therapy to be a more widely recognised profession by the public and other healthcare disciplines. 'The OT Hub' is a new information-sharing website aiming to address these needs. Currently in progress, a primary research study aims to answer the question 'What are the benefits, limitations and potential of The OT Hub for occupational therapy?' This insight has yet to be formally examined in academia and the research will aim to address this gap. The data collection method chosen is a quantitative and qualitative survey, consisting of multiple choice and short-answer questions. The survey is open to student and qualified occupational therapists, either in practice or retirement. Inclusive of all nationalities, participants are drawn from existing website members and social media followers of The OT Hub. Completion of the survey is via Qualtrics, a university-approved research platform.

The research will adopt a systematic and rigorous approach, from inception to dissemination of findings. Ethical approval from the UWE Ethics Committee has been granted. Findings will be born from frequency and item analysis and the coding of open-ended questions. Critical analysis will evaluate validity and reliability. It is envisaged that research findings will support the development of The OT Hub, an online platform that aims to bring the worldwide occupational therapy community closer together. It is hoped that, as a result, the future support that this community provides to the public could be enhanced.

What roles do city farms have in building communities?

Sarah Bannister
Geography & Environmental Management

My final year project covers three key topic areas: urban planning, city farms and communities. My overall aim is to find out what roles city farms play in building communities. Many people know that city farms are places where you can go to see animals and be outdoors, but forget that they do a lot more for the wider community. I am therefore looking into how city farms create communities, what their benefits are, and whether the planning system could actively encourage more of them through planning policy and/or as part of a new development or standalone. My aim is divided into four categories: communities, social aspects, the planning system and policy. Bath City Farm is my case study focus.

I will collect primary and secondary data through a variety of methods, undertaking qualitative and quantitative research through questionnaires, interviews and focus groups. I will carry out this research at Bath City Farm and at the local council (Bath and North-East

Somerset). I will also undertake desktop research into other examples of city farms to compare and contrast. I expect to find that volunteers at Bath City Farm feel a sense of belonging by coming to the farm and therefore feel part of a community. I also anticipate that the local council does not have any plans for another city farm in the near future. My research should lead to a better understanding of the multiple benefits of city farms in the creation and sustaining of communities. It might also prompt the local council to potentially look into possible sites for another city farm and/or developers actively including sites for city farms in their development plans.

The effectiveness of active case finding for tuberculosis in homeless populations: a systematic review

Kathryn Hamilton and Julie Mytton
Health & Applied Sciences

Setting: Tuberculosis (TB) is prevalent in the homeless population; it represents a source of health inequalities and a challenge to eradication. Active Case Finding (ACF) refers to strategies to identify people with TB, who would not otherwise have sought timely medical care. Evidence used in international guidelines is commonly from mixed high-risk groups, and evidence-based approaches specific to ACF in the homeless population are needed.

Objectives: To determine effectiveness of TB screening programmes for homeless populations in low and medium-burden settings.

Design: A systematic search of electronic databases and grey literature sources was conducted to identify studies that reported the effectiveness, uptake and/or yield of programmes to detect latent TB infection (LTBI) or active TB affecting any site. Included studies were critically appraised, and described using narrative synthesis.

Results: 20 studies met inclusion criteria. Studies were heterogeneous with respect to setting, definition of homelessness and programme delivery which may have contributed to variability in uptake of screening and diagnostic pathways, and completion of treatment. ACF appeared effective in three time trend analyses. Uptake of screening was increased by incentives, peer educators, and professional support. Completion of the diagnostic pathway was higher in studies where additional support was provided. Those most likely to be diagnosed with TB appeared less likely to accept screening. Yield of screening was 1.5-57% for 41,684 participants tested for LTBI, and 0-3.1% for 91,771 participants tested for active TB.

Conclusion: ACF appears effective, and strategies to improve uptake are identified. Screening should link to the diagnostic and treatment pathways, and engage with a broad spectrum of homelessness to achieve desired objectives. Variability in uptake and yield necessitates programmes tailored to local populations.

Happiness within space: architectural utopianism in the physical reality of today's world

Regina Dimitratou
Architecture and the Built Environment

This research aims to examine if utopian ideals can help architects to shape a place that will improve humanity’s well-being. In order to do this, the research will consider whether or not

space can contribute to human happiness. The research aims to highlight the concept of Utopia as a useful tool for architects and planners to build responsibly to meet human needs and well-being, considering how utopian ideals have been realized and used in the past.

Reading and researching what people have said and observing and learning from the past will help the research to reach a logical conclusion. The research examined different opinions of people, regarding whether architecture has the capability to benefit society, and if utopian ideals can be useful. Documents can expose a great deal about people and their movement, about history, society, and the culture and policy in which they emerge. Through an extensive study of relevant literature, in combination with personal experience as a student architect, studying theories and past architecture, this research analyses how utopian ideals have been beneficial for humanity in the past, and how can they contribute to social happiness today. Humanity has more power than ever before to create architecture that will contribute to its well-being. Earlier, revolutions, wars, technological advances and the growth of the capitalist economy led to proposals for a great number of radical and futuristic schemes for transforming society, contributing a great deal to utopian thinking during the 20th century. Utopia appears to be vital for human progress, and its ideals create new potential for architecture to find a balance between humanity, technology and the real world, generating a meaningful connection with the human.

Stream 11:

The correlation between our emotions, moods and surroundings

Raphaella Silva
Geography & Environmental Management

This research outlines the impact our environment has on our mood and emotions on a daily basis. The question to be answered is 'could a room affect the mood of a person'? This work will offer a better understanding of why interior designers and architects design certain places the way they do, such as schools, and why layouts are often similar. The primary data gives an insight on the key aspects of a room that could cause a parson to feel emotions. An example of a room many described as scary and uneasy is a room with little natural light, dark coloured walls, little furniture and no view from windows. Perhaps certain rooms found unappealing or scary are due to representation in movies of creepy and unattractive places, like an abandoned mansion or a cabin in the woods. Aspects that will be examined are whether wall colours, natural lighting, room space, decorations, ventilation, plants or room layout have an impact on what people see as a comfortable and ideal room. This study will attempt to discover why some rooms are more appealing than others, what emotions are aroused by an ideal room, and whether rooms with different purposes can change the idea of what a perfect room would be.

Trekking through Malaysia

Ang Hui Qing
Art & Design

In this era of globalization, Malaysia is increasingly exposed to western media, potentially affecting the habits of local creators and consumers alike. This research examines the American-made franchise that is Star Trek and its dynamics in Malaysia as a cultural location, arguing that a Malaysian audience can connect to the story on a greater than

superficial level. I link Malaysia and Star Trek specifically because it represents how Western media has affected my cultural and personal identity. Being Asian comes with a set of behavioural expectations that I do not meet. As a result, I have received comments about how I have been 'Westernized', which is not unheard of in Southeast Asia, but it is not often talked about.

The research touches on how Western fiction has impacted its non-Western audience and creators. I used the auto-ethnographic method for my investigations, drawing upon personal experience, interviews with other Malaysian Star Trek fans, external texts surrounding Star Trek and the source material itself. I employed theories mainly from Henry Jenkins and Petra Rehling. I discovered that there is very little academic material about the topic of transcultural exchange in fiction and its impact, and that it is important to speak about it and bring it to wider attention.

Using Unmanned Aerial Vehicles (UAVs) to inform management of the large blue butterfly (*Maculinea arion*) in Daneway Banks, a Site of Special Scientific Interest

Isaac Lucksted
Applied Sciences

This research sought to explore the use of a novel technology, Unmanned Aerial Vehicles (UAVs), to collect geospatial data from a Site of Special Scientific Interest; Daneway Banks in Gloucestershire. The data was used to inform the management of a nature reserve for the needs of a particular protected species. Specifically, it tested whether up-to-date point cloud aerial images could be used to accurately quantify the total proportion of scrub vegetation on a site managed for the large blue butterfly (*Maculinea arion*). This report outlines the methodology used and creates a protocol for the isolation of scrub, as well as identifying limitations in the methodology and outlining future research potential.

Reconciling humans, existential freedom and nature: exploring existential concepts through Sartre, process philosophy and Schelling

Bryony Martin
Health & Social Sciences

Sartre's existentialism provides a compelling account of the psychological reaction to the knowledge of one's own freedom. However, fundamental to Sartre's account is the distinction between undetermined beings-for-themselves, i.e. human beings, and determined beings-in-themselves which are unable to change, which includes the rest of nature. This places human freedom as something super-natural, separating human beings from the rest of nature. This dissertation explores the issue and argues that it is a consequence of a bad metaphysics, which understands essence (being) as a fixed, determining concept. I wish to argue that just as nature is a process, so are human beings as an extension of that nature. Therefore, a human's essence is undefined, as their individual life is a process. Through the work of F.W.J Schelling I argue that his account of essence as the process of becoming, and identity as relational, allows for a fundamental ontological freedom within human beings and the rest of nature. The ultimate aim of this dissertation will be to present a method by which humans, existential freedom and nature can be reconciled.

Stream 12:

Assessing the microbial quality of water from different local sources in an urban town in South East Nigeria, Nsukka

Nkeiruka Edeh, Emmanuel Adukwu, Vincent Chigor & Anna Bako
Applied Sciences

A total of 288 water samples were collected from six different water sources: roof harvested rain water; tanker supplied bore hole water; packaged water; well water; spring water; and household and public taps, to assess their bacteriological quality and to determine the human health risk that each source poses. The samples were collected over six weeks between August and September 2017 in Nsukka, South East Nigeria.

The membrane filtration method was used to estimate the total number of viable bacteria in each sample, in this case *Escherichia coli, Salmonella* sp. and faecal coliforms and the colony forming unit for each sample was calculated. Three biochemical tests were conducted to further differentiate between the bacterial species; the indole test, the catalase test and the citrate test. The antimicrobial susceptibility for each sample was estimated using the Kirby–baur disc diffusion technique. Results show spring water has the highest faecal coliform count (42 cfu/ml). Tanker supplied water has the highest *E.coli* count (21 cfu/ml), and well water and tap water have the highest value of salmonella count (20 cfu/ml). For the antimicrobial susceptibility testing, the majority of the salmonella isolates were susceptible to all antibiotics, while for *E.coli* the majority of isolates were also susceptible to all antibiotics. *E.coli* has a higher amount of resistant isolates (at 32 isolates) and salmonella (having a total of 17 isolates) was found to be resistant. The average pH values for roof harvested rain water, tanker supplied water and packaged water fell within the WHO guidelines for drinking water. However the pH levels for household and public taps, wells and springs fell below the WHO guidelines as they are acidic. There is a need for water sanitation systems and infrastructures to be in place to reduce the burden of water-borne diseases not only in Nigeria but globally.

Does the law satisfy modern divorce?

Natalie Neoh
Bristol Law School

In 2017, Tini Owens filed for a divorce from her husband on the grounds of his 'behaviour'. She claimed that instances of behaviour towards her had ultimately made it difficult for her to be married to him. In 2016 alone, there were 106,549 divorces in England and Wales. And from those numbers, 61% had used the same reasoning for a divorce as Tini Owens. The difference between the thousands of cases compared to the Owens case was that her petition was rejected. The reasoning behind the rejection has attracted the public's attention, opened up dialogue on the difficulties in obtaining a divorce and, led to questioning about whether the current law needs reviewing.

This study aims to explore whether a reform of the Divorce Laws are required. Some criticise the law for no longer holding the goals it did in 1975 and not reflecting the current demands of divorce. Others argue that a change in the law would ultimately undermine the principle of marriage itself, making divorce simpler for the public. In conducting this study, the aim is to determine whether the laws of divorce are still applicable in a 21st Century context.

A multimodal robot interaction system for automatic feeding tasks

Miriam Cristofoletti & Mihai Anca
Engineering, Design & Mathematics

Nowadays, more than ever, a growing number of people are struggling to live an independent and dignified life in their own homes, mainly due to either severe disabilities or physical impairments. Consequently, there is a pressing need to provide these people with some kind of physical and cognitive assistance. This paper presents a robotic assistance system to support people whose abilities to perform basic self-maintenance activities are either severely diminished or otherwise non-existent.

The scope of this paper is restricted to a self-feeding task. A multimodal approach that combines visual and speech information is proposed for the human-robot interaction and the automatic manoeuvring of a robot arm (Kinova JACO) to perform simple assistive tasks such as picking up objects or fruits located on a dining table. Object detection is performed using data captured in real-time from a high-speed camera. Images captured are segmented for potential regions of interest representing fruits (apples or oranges). A bank of filters is applied to each segmented image and, subsequently, the resultant filtered images are fed to a Convolution Neural Network (CNN) that outputs the categories of fruit present in the original images. The output of the CNN is also used to localise the fruits within a reference coordinate system. While the CNN detects and recognises the fruit categories, a voice recognition system, trained using Google's Speech API system, is used to capture the voice instruction from the user relating to the selection of the fruit to pick. The proposed integrated multimodal system, presented in this paper, thus provides an intelligent and accurate pick and place mechanism that is fundamental to a fully autonomous self-feeding robotic system.

Leadership development through UWE: a student radiographer's journey

Iraje Nadeem Ahmed
Allied Health Professions

Effective leadership is pivotal, not just in business management but in other areas as well, including healthcare. I started university at the age of 18, straight after finishing my A-Levels. I therefore had no major work experience. However, in the first year of my degree an opportunity arose for a dedicated 'Student Representative' for my cohort. Having undertaken that role, another opportunity soon arose for a 'Lead Departmental Representative'. I read the role description, which sounded really interesting, such as the opportunity to sit on the Academic Standards and Quality Committee (ASQC) and Departmental Committee (DC) meetings. I ended up being elected for this position. I remember feeling extremely daunted in my first ever ASQC meeting, where I was not familiar with anything, from the terminology used to the committee members present in the meetings. However, the support that I received from the committee members alongside the Students' Union was phenomenal - everyone was so welcoming and encouraged me to speak in these meetings. That is where I started building the confidence and the passion to represent the student voice. From that day onwards, I started to grow more and more. I would not miss any opportunity that came my way, despite the heavy workload in years 2 and 3. Today, I am representing the voice at a national and university level by being elected as an 'Education Officer' in my final year. At this conference, I aim to reflect back on my

student journey at UWE, highlighting how I reached where I am today and how I managed the challenges I encountered during this journey. By doing so, I hope to inspire other students to follow suit.

Stream 13:

Optimising the cooling of an exhaust gas recirculation system to reduce emissions from a diesel engine

Joe Laughton
Engineering, Design & Mathematics

Current Euro 6 emission regulations and standards are pushing vehicle manufacturers to continuously reduce engine emissions. One current priority is the reduction of nitrogen oxide (NOx) emissions, which is a major issue with diesel engines. The method of using an exhaust gas recirculation (EGR) system within the engine has been used commercially for the past 30 years and is a proven method to reduce diesel NOx emissions. In order for exhaust gas to be recirculated in an EGR system the original exhaust gas must be cooled by a heat exchanger to be reused efficiently. To allow the EGR to work as efficiently as possible an optimum cooling water temperature must be found. In order to find this optimum cooling water temperature a simple 4 cylinder diesel engine was modelled on the computer software Ricardo WAVE. There was a clear correlation between temperature reduction and emission reduction when reviewing the results obtained from the engine simulation. These results were further validated once they were compared against current literature showing similar trends. Reducing the temperature of the recirculated gas in the EGR system improves the efficiency of the engine and lowers the emissions. A lower EGR gas temperature is optimal for the reduction of NOx emissions.

A GIS-based evacuation plan for high flood risk areas in Bristol

Onyeka Okeke, Kerellos Mishirik, Francis Ekechukwu & Huan Li
Geography & Environmental Management

There are several areas in Bristol which are at risk of flooding from the River Avon. An estimated 3,240 (1.53%) and 9,000 (4.25%) properties are at risk in a fluvial flood event of 1 in 100 and 1 in 1000 year respectively. Bristol City Council (BCC) developed activation triggers and plan processes for rapid response to high magnitude flood occurrence. They did not, however, provide safe routes out of incident zones and possible locations for shelter points when evacuation becomes inevitable. This study is therefore crucial to providing evacuation route networks during such events. The study is streamlined to generate a route plan on the occurrence of fluvial flooding only for a high risk zone in Bristol.

Multi-criteria decision making (MCDM) was used to select a study area within Bristol and also to locate candidate evacuation/shelter points. The GIS network analysis tool was used to map out the optimum route from incident locations (862 network junctions) to shelter points. Southville and parts of Bedminster, Cabot, Lawrence Hill, Windmill Hill and St. George East were found to be most critical in terms of vulnerability, but due to recent flooding incidents reported in 2013 and 2014, Southville and parts of Bedminster were selected as study locations covering a population of 31,922. This area was also classed as a location at risk in the BCC Flood Plan of 2014.

This study shows that although the majority of the incident points could access at least a shelter point, others took longer routes due to restrictions by the water body and/or non-motorised access. In this situation, it is recommended that capital intensive projects be sited off locations with longer access routes unless infrastructure in the form of roads, bridges or culverts (fast route) and improved flood defence mechanisms are put in place.

How are occupations used to improve well-being in communities following a natural disaster? Implications for Occupational Therapy

Kate Holland
Allied Health Professions

Occupational therapy can sometimes struggle to be recognised for its intrinsic and unique skills. Currently, many non-governmental organisations (NGOs) and agencies working in disaster response and recovery do not look to specifically recruit occupational therapists in their response teams. Natural disasters impact the ability of survivors to carry out fundamental activities which can negatively affect the well-being of people and their communities. The World Federation of Occupational Therapists recommends occupational therapists' involvement in all areas of disaster management from planning to recovery, local to national level, and attending to physical and psychosocial needs. This research aims to ascertain what activities are being used with communities following a disaster, by whom, and how the unique skillset of Occupational Therapy could meet the needs of the post-disaster community. This systematically structured literature review will critically appraise literature regarding disaster recovery and community development, employing a social constructivist approach.

Findings are expected to include how occupations are chosen, by whom, and how they are implemented. It is anticipated that many different types of occupations are utilised to improve well-being by trained healthcare and aid workers, but that few, if any, are undertaken following the occupational therapy process. The lack of involvement of an occupational therapist providing a comprehensive and holistic assessment indicates areas of a community's needs may be overlooked.

Conclusions will be drawn regarding the current use of occupation by those working in disaster recovery and how an occupational therapist could meet identified gaps in the service. Due to the holistic nature of the profession it may also be that occupational therapists could provide support currently delivered by more than one professional or agency. Potential implications for practice are increased awareness of our profession, its capabilities, and the benefit of its role in disaster response.

Hyperloop One: implications for the UK economy

Sara Cristofoletti
Bristol Business School

This research describes the consequences of the introduction of Hyperloop transportation on the UK economy on an aggregate scale. A length of time of approximately ten years was considered appropriate for this purpose as it would give enough time to assess the situation from a future perspective. The aspects explored are increased business efficiency through time savings, increased business innovation by economies of scale and improved efficiency of the job market by higher accessibility to jobs. By extending the economic boundaries,

better accessibility between producers and consumers would result as a direct consequence. Agglomeration can also benefit regional economies through greater specialization and competition, as density increases average labour productivity. Better accessibility is a requirement for increased productivity, as improvements in transport systems would improve economic growth.

However, there can be indirect impacts on the economy too, causing a redistribution or reallocation of resources or the entry or exit of firms. As promoters of economic development, transport infrastructures, in fact, have important 'spatial impacts', for example on intra-regional and inter-regional transport time and costs, and thus potentially on location of households and businesses.

Overall, through showing the economic impacts on a nationwide scale and on some regions specifically, this research will highlight the importance of this technological advancement in shaping the British economy through faster means of transportation.

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