Ollscoil Teicneolaíochta an Oirdheiscirt

South East Technological University

POSTGRADUATE RESEARCH CONFERENCE 2023

‘Pushing Boundaries: PG Research @ SETU’

BOOK OF ABSTRACTS

MAY 31st 2023

#PGConference@SETU

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Welcome & Thank You

We are very excited to welcome you all to SETU's post graduate conference 'Pushing Boundaries – Postgrad Research at SETU'. Building on the success of last years inaugural conference held in Waterford the response this year from students across SETU has been phenomenal.

Due to the volume of students participating, we have 72, there are parallel sessions of oral presentations taking place from 11.30am. We would encourage all attendees to visit each poster and listen to as many oral submissions as possible to get a flavour of the breath of research been undertaken in SETU.

Marta and Trish wish to thank SETU's Graduate Studies Office for their guidance and help in organising today. In particular, Sineád O'Halloran and Cathy Pembroke who worked with the students last year and provided invaluable support to us over the last couple of months. A huge thank you to the lecturers across all campuses who gave of their time to review the abstract submissions within a tight time frame. In addition, thank you to today's judges - they have a difficult job ahead of them.

We also wish to thank Dr Patricia Mulcahy for her support and for her opening address, Dr Tom O'Toole for closing the conference and Dr Sally Shortall our keynote speaker. Many thanks to our fellow postgrad's Manasa and Katie who compiled this book of abstracts and who along with Luke will chair a session.

Thank you also to the porters office, Matt in IT Services and the catering staff for their quiet unflappable professionalism. Finally, a huge thank you to all the postgraduate students and their supervisors. Without their abstract submissions and their dedication to research within SETU, today would not be possible.

Best of luck to all the students presenting today. We are looking forward to learning from one another, building connections and collaborations across campuses and 'Pushing the Boundaries of Research at SETU'.

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Poster Presentation Schedule

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2	***Ornella Yondjin Ngamy***	Defining Local Food
3	***Sarah Egan***	An exploration of risk feeding within Intellectual Disability Services in Ireland: A 'Soft Systems' study.
4	***Jiao Zhang***	The optimization of solid-state fermentation parameters for brewers' spent grain protein extraction and the assessment of their techno-functional properties
5	***Emma Fuller***	Investigating the core microbiome associated with Common Alder (Alnus glutinosa) trees to isolate potential bio-agents against the Alder dieback pathogen; Phytophthora alni
6	***Amy Whelan***	Examining the drivers of Leisure and VFR passengers sustainable consumer behavioural intention in the Irish aviation industry.

7	***Denise McAllister Wylie***	Pushing Boundaries for Inclusive Internationalisation in Irish Higher Education
8	***Steven Suan Zhu***	High Resolution Agent Based Model For Viral Progression And Prediction Policy Optimization at Municipal And Sub-municipal Level
9	***Anukriti Vashishtha***	Does organic grain enhances the terroir of Irish whiskey
10	***Mutian Wang***	Investigating the Function, Persistence, and Biosafety of Constructed Microbiomes for Improved Bioremediation of Petroleum-impacted Soil
11	***Aoife Langford***	To Assess Movement Competence of Irish Primary School Children Through Fundamental Movement Skills Using Standardised and Novel Measures
12	***Patti Roche***	Pot Trial - How can soil structure influence phosphorus dynamics?
13	***MD Shamsuzzaman***	InSAR Data as a Peatland Monitoring Tool: Insights into Hydrological Processes and Ecosystem Restoration in degraded raised bogs of the Republic of Ireland
14	***Samanyu Raina***	Feasibility studies of Radial nozzle for Internal Diameter Coatings in Pipes using Cold Spray Process
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16	***Julie Crowley***	A Study of Irish Nurses and Caregivers During the Great War
17	***Katie Healy***	Enhancing the sustainability of mineral use on Irish cattle and sheep farms
18	***Jack Sweeney***	Suicide Prevention in the Construction Sector
19	***Shannon Hughes Spence***	Pre-drinking as a liminoid ritual - Women's experiences in the Night Time Economy
20	***Maeve Mannion***	The effects of the menstrual cycle on objective performance in females participating in weight categorised sports
21	***Raph Britton***	Amateur Boxing Coaches Perceptions of Straight Punch Technique and Strength and Conditioning Practices

22	***Andrea Buckley***	Gender-sensitive Lifestyle Psychiatry for Individuals with Severe Mental Illness - A scoping review with a focus on gender-specific studies. Preliminary results.
23	***Abinash Nayak***	Development of enzymatic methods for the synthesis of carbohydrate fatty acid esters (CFAEs) employing quantitative NMR (qNMR) as an analytical tool
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25	***Sarah Foley***	Recombinant human ASPA expression in E. coli and P. pastoris and activity assay development
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27	***Bahram Choupanzadeh***	Investigating the Impact of DTL Dose in Displacement Talbot Lithography on Photoresist Removal
28	***Syeda Atitqa Tajammal***	Extraction of Active Substances from Green Tea and their Incorporation in Phytosomes to Improve Stability, Bioavailability, and Permeability
29	***Jade Stanley***	Mechanical properties of Starch-protein blend bioplastics with the use of sustainable starches
30	***Sarah Fagan***	Exploring the perceptions of and preferences towards exercise and nutrition supplements among older adults with frailty
31	***Brian Mulhare***	Exploring Older Adults' Perceptions of the Barriers, Facilitators, and Motivators to Resistance Training: A Qualitative Study using the COM-B Model and TDF
32	***Jennifer Drohan***	Development of a living base station for molecular communication
33	***Ali Taha Ozdemir***	The engineering of drug loaded nanospheres as a first line of defence against COVID-19
34	***Shane Ryan***	Intra- and inter-day reliability of inertial loads with cluster sets when performed during a quarter squat on a flywheel device.

35	***Alistair Chambers***	Methods of determining erosion rates of Wind Turbine blade coatings
36	***Anne O'Mahony***	Views of Transformative Learning, Perspective Transformation and Transformative Education – a comparison of conceptions in the literature.
37	***Sylwia O'Rourke***	"Wired and developing: the perceived role of Digital Interaction in Early Childhood Education and Care"-the systematic review of literature.
38	***Adam Stead***	Community and Communication: The future of 21st Century agriculture

Presentation Abstracts

K103 10:00 – 10:10

Rakesh Rayapureddi – engCORE

Title: Assessing Urban Heat Stress and Air Quality Using High-Resolution CFD Simulations – Case Study within Dublin CityCenter

Abstract: Due to climate change coupled with rapid urbanization, cities are experiencing extreme heatwaves in hot summers and near-field pollutant dispersion, with severe risks to public health. Unprecedented heat and mass interactions due to the complex city structures and high-rise/high-density buildings orientation influence the microclimate, resulting in lower living quality. It is important to study pedestrian wind and thermal comforts in urban areas to better design mitigation measures by city planning bodies and policy makers. This study examined the outdoor thermal comfort conditions and air pollution dispersion in the case study neighbourhood of College Green, an important traffic route in the center of Dublin city. The turbulent wind flow pattern around the region is obtained by solving the 3D steady Reynolds-averaged Navier–Stokes equations with the realizable k–ε model on an extensive high-resolution grid based on grid-convergence analysis. The focus of the study is to assess the cooling effect (CE) and heat reduction (HR) due to the vegetation and waterbodies, along with the near-field dispersion analysis, in the city. The 3D model of the city has been generated using Geographic Information System software (ArcGIS). Modeling was carried out using hourly sequential meteorological data measured at Dublin Airport. The vehicular emissions data obtained from the literature has been used as the pollutant source throughout the simulations. Finally, we compared the modeling results of the physiological equivalent temperature (PET) index, particulate matter concentrations (PM 2.5 and PM 10), and air temperatures with remote sensing and empirical field measurement data. This analysis provides an improved understanding of the micro-climate of the wind resource in the Dublin city center, facilitates future studies of wind comfort and thermal stress in urban areas with CFD techniques, and, in this way, contributes to improved wind environmental quality in urban areas.

K103 10:10 – 10:20

Trish Finegan – designCORE

Title: Co-Designing an Inclusive, Multi-Campus Age Friendly University for the Future: Selecting the PhD Methodology

Abstract: The Central Statistics Office (2016) predicts that by 2031 the number of older adults nationally will double. In the Southeast, this equates to an increase of over 50,000 older people. According to the Higher Education Authority (2022) SETU has a higher than average student age profile. Awareness and inclusion of older people within SETU will be important for its future. The concept of an Age Friendly University has its genesis in the WHO's Age Friendly Cities and Communities Project and draws on the principle of equity across the life course. It will ensure an inclusive environment for a diversity of learners as well as intergenerational and community connections. Using the framework devised by Finegan (2022) this PhD project will use a Research through Design methodology. In addition, Asset Based Community Development (ABCD) principles will work alongside co-design and co-production methods to listen to the voices of all stakeholders. Stakeholders include students and staff of the universities three campuses, the communities and organisations in which the campuses are situated and, older people and their support and advocacy organisations. The project will consist of four distinct stages. Before the field research begins a Research Advisory Group (RAG) – representing all stakeholders - will be convened to work alongside the researcher helping to design the field research, formulate questions and assist in verifying the data analysis. The research process will be in three stages. Initially semi-structured interviews will be undertaken to gain an understanding of AFUs both nationally and internationally. These will be followed by three codesign sessions – one on each of the three campuses of SETU. The final stage will be a co-production workshop with representatives from the three co-design sessions. Using the data gathered from the previous stages of the research the workshop will be solution focussed, envisioning an AFU for SETU.

K103 10:20 – 10:30

Emilie Roche Culleton - healthCORE

Title: A multi-levelled, evidence-based suicide prevention programme in the Irish Construction Industry

Abstract: Mental health in the construction industry has become an important topic in recent years. Research indicates an elevated risk of mental ill health and suicide among employees in male dominated industries in comparison to the general population. Male dominated industries typically refer to workforces comprising of more than 70% male employees within the following industries :Construction; Mining; Manufacturing; Agriculture; Transport; Information Technology and Utilities. Psychosocial risks in the workplace are factors that may harm physical or psychological health and certain occupations are at a higher risk of exposure to psychosocial risks than others. Previous research has identified risks such as subpar working conditions, financial insecurity, and unsociable hours as precipitating factors. Masculine norms, workplace culture and stigma have also been identified as contributing factors. Research has shown promise for engaging and supporting men around their mental health in settings where men gather. This has prompted the development of multi-levelled suicide prevention programmes in the workplace. There is limited research in this area in Ireland, however evidence suggests that while employee mental health is a critical issue, there are difficulties around managing mental health in the Irish construction industry. This research aims to provide an evidence base for the development of suicide prevention resources in this industry and aims to do this across five phases (i) a systematic review of the existing interventions in male dominated industries (ii) semi structured interviews with construction workers to explore sources of psychological distress (iii) focus groups with employers exploring barriers and facilitators to supporting employee mental health (iv) Co-design workshops to develop suicide prevention training to ensure relevance and acceptability of training (v)evaluation of training and resources. Results to date through the systematic review have potentially important implications on the future design and replication of occupational suicide prevention resources.

K103 10:30 – 10:40

Katie Phair – enviroCORE

Title: Growth media influences the impact of exogenous fatty acids on Cronobacter sakazakii cell function and viability

Background: Cronobacter sakazakii is an opportunistic food-borne pathogen predominately associated with infant formula, with current inhibition methods reliant on manufacture and reconstitution guidelines. Fatty acids are gaining interest as potent antibacterials which are safe to consume. This research explores the efficacy of fatty acids delivered via complex and defined media, as antibacterials to combat C. sakazakii.

Methods: Oleic acid, linoleic acid and α-linolenic acid ranging from 31.25μMto 1000μM, were individually introduced to overnight C. sakazakii cultures. The impact of each exogenous fatty acid was observed in terms of bacterial viability and virulence. Growth over 24-hourswas recorded using a FilterMax™ F5 Microplate Reader at 37°C.Biofilm formation, a key virulence trait, was assessed using the Crystal Violet assay.

Results: Complex Media: α-linolenic acid at 31.25μM reduced growth, while oleic acid and linoleic acid were not shown to significantly impact growth. Oleic acid and linoleic acid at 125μM reduced biofilm formation by38.3% and 12.2% respectively, while the same concentration of α-linolenic acid resulted in a 76.4% reduction compared to the positive control.

Defined Media: Concentrations as low as 31.25μM of each fatty acid caused reduced growth when compared to the positive control. At1000μM, both α-linolenic acid and linoleic acid led to a 1-logreduction of bacterial culture, this is theorized to be due to reduced membrane integrity leading to cell lysis. Oleic acid and linoleic acid at 125μM reduced biofilm formation by 21.4% and30.0% respectively, while the same concentration of α-linolenic acid resulted in a 31.7% reduction compared to the positive control.

Conclusion: Media choice impacts the efficacy of exogenous polyunsaturated fatty acids as antibacterials against C. sakazakii. In general, defined media allows for greater growth inhibition, while complex media facilitates greater biofilm inhibition.

K103 10:40 – 10:50

Christopher McDermott - Department of Health Science

Title: Football Cooperative, a community based physical activity social intervention for men: The development of an implementation strategy for scale up.

Abstract: Football Cooperative (FC) provides social 'pick up football' games aimed at reducing social isolation and enhancing health and wellbeing among men. Recreational football has the potential to return fitness benefits including: Improved metabolic, cardiovascular and musculoskeletal fitness, and health benefits including: decreased blood pressure, heart rate and fat mass, and an increase in bone density, which presents solutions to addressing existing challenges in men's health today.

This study aims to gain insights into operating characteristics of FC, both internally and externally, as well as learning from good practice elsewhere [sport and/or health initiatives that have been scaled successfully], with a view to developing a scalable implementation strategy for FC. Qualitative data from key stakeholders (within FC: participants, volunteer coordinators, the FC founder and policy and funding representatives; beyond FC; user, provider, organisational and wider systems levels) is being collected to understand the key processes and determinants to delivering FC and similar initiatives at scale. Interviews and focus groups guided by the Consolidation Framework for Implementation Research (CFIR)will be conducted with key stakeholders.

At FC sites, short ad-hoc interviews to capture the user experience post games alongside observational data and reflective journaling will also be employed at external sites, informal (ad-hoc conversations) with key stakeholders and reflective journaling will also be employed. Data collection is ongoing with the FC founder and a researcher is embedded at games from February to June. In the Autumn, international data collection will be conducted at 5-6 sites. All data will be transcribed verbatim and analysed via a combination of deductive and inductive thematic analysis to identify barriers and facilitators to implementation. This wide collection of various data and subsequent analysis will lead to the development of an implementation strategy, which is crucial scaling FC for the benefit of population health within Ireland and beyond.

K103 10:50 – 11:00

Dillon O’Reilly - engCORE

Title: Advancements in Small Satellite Electric Propulsion: A Low-Power Pulsed Plasma Thruster Power Processing Unit

Abstract: Small satellites are a cost-effective solution for earth observation, astrophysical observation and communications infrastructure for private entities, educational institutions, and small businesses. These highly valuable, lightweight spacecraft (<100kg), provide users with a vast number of potential capabilities. However, due to mass, power and size constraints, each subsystem onboard the spacecraft requires careful selection and rigorous testing. The attitude control and stability of the spacecraft is typically provided by reaction wheels and magnetorquer subsystems. Dedicated propulsion subsystems on the other hand, have seen very little implementation in space onboard small satellites and only specific types of propulsion subsystems are suitable. Pulsed Plasma Thrusters (PPTs) are a form of electric propulsion (EP), that are suitable for small satellite mass, power and size constraints. PPT scan provide attitude control and stability as well as; orbital manoeuvring, active de-orbiting, formation flights and spacecraft lifetime extension with masses as low as 2 kg, operational powers as low as 1 W and sizes in the 0.5 U range. This work presents a novel low power co-axial pulsed plasma thruster power processing unit converter for higher power efficiencies, lower mass and size. The developed power converter is capable of charging a 5 J pulsed plasma thruster to 1600 V with an efficiency of 86%. Improving the efficiency, size and mass of the converter, provides more power for manoeuvring, reduces power loss and reduces costs. These improvements enable more ambitious scientific missions, higher payload capacity and mitigated spacecraft debri.

K103 11:40 – 11:50

Elena Grosu - enviroCORE

Title: Quantifying the biostimulant activity of Ensifer adhaerens Op14 to support sustainable crop production

Abstract: In the last decade, EU regulations (EU Directive 2009/128/EC) have oriented the region towards more sustainable crop production, limiting the use of chemical crop improvement products. Moreover, an increase in volatile weather patterns linked to climate change impacts production systems and highlights the need for more resilient cropping systems if we are to achieve the European Farm to Fork goals for 2030. In this light, the biostimulants field has received considerable attention. Microbial inoculants (i.e. plant growth-promoting bacteria) have proven to improve plant growth and yield via entering the plant nutrient cycle and actively enriching nutrient availability. This project focuses on characterising the biostimulant activity of the soil bacterium Ensifer adhaerens strain Op14. Previous work highlighted the beneficial effect of Op14 seed treatment on improving the seedling development of both monocot (wheat) and dicot (oilseed rape) species. Under glasshouse conditions, strainOp14 enhanced plant development in oilseed rape by 7%, 6%,and 14% based on the assessment of height at the nine-leaf stage, stem diameter and the number of inflorescences at the flowering stage, respectively. Moreover, Op14 treatment showed significant improved of pods weight and seed yield at harvest. Trying to understand the molecular mechanisms behind these beneficial effects, we exposed the strain to plant extract firstly and separately to different concentrations of salicylic acid (SA) and evaluated the expression of pchB and salD genes involved in the SA synthesis and degradation and other plant-microbe interaction pathways for up to twelve hours post-treatment. Further investigations are underway to test the growth-promoting effect on spring wheat under glasshouse conditions and to evaluate the promotional effect of the bacterium in field trials of winter oilseed rape. Additional work will study the efficiency ofOp14 to enhance abiotic stress resilience while continuing to work on understanding the genetic mechanisms underpinning the beneficial interaction.

K103 11:50 – 12:00

Theeba Shafeeg - engCORE

Title: An Investigation to Utilize Contact Resistance for Cold Weld Adhesion Measurement for Metals in Space.

Abstract: The adhesion process known as cold welding occurs when two clean metal surfaces are brought into contact in an inert atmosphere. Thin film theory and energy barrier theory provide integrative explanations for this fusion mechanism. This research investigates these theories and aims to exploit this phenomenon for its use in repairing spacecraft hull after a space debris impact. This paper proposes a test measurement technique to investigate the surface topology factors in cold weld adhesion using contact resistance methods. Cold welding is a function of surface roughness and contact area. This bond can be correlated with contact resistance measurement of these two surfaces. The use of Scanning Electron Microscopy (SEM) is a common method used to establish the surface roughness of a test sample. Typically, these values are N3-N7. It has been shown that the application of tangential force combined with normal compression of spherical contacts sets (Hertzian) to surface treated clean metal samples are the optimum conditions required to promote cold welding. Cold welded joint adhesion may be characterized through the incorporation of Kelvin's Double Bridge which can measure the contact resistance to a resolution of 1e-4 Ohms. With known bulk resistivity of the metal, Holm's equation of resistance is used to calculate the real surface contact area that is caused by the applied forces. As a result, contact resistance measurement can be used to indirectly evaluate the quality of the metallurgical bond between two metal surfaces. An experimental test rig is underway to verify the stated theories with selected metals that include Aluminum Alloy (AA-7075), Stainless Steel with Nickel (SS17-7PH) and Indium. This research forms part of a sounding rocket experimental payload for the development of a repair method for a spacecraft hull perforation due to a space debris impact.

K103 12:00 – 12:10

Antoinette Jordan - Department of Management and Organisation

Title: The sociology of policy and code: assembling public employment services

Abstract

Purpose: This paper explores the datafication of public employment services, to better understand the assemblage of policy and code in the development of social policy.

Method: Insights are drawn from an assemblage oriented ethnographic study of policymaking in the datafied welfare state. To explore the ethnography of a policy, an assemblage ethnography (Wahlberg, 2022) was used, with an STS and ANT inspired approach (Latour, 2005; Ingold, 2016; Law & Callon,1988). Methods include analysis of policy reports, press releases, policy launches and interviews with academics, civil servants, technology experts and consultants.

Theory: The theoretical framework is informed by assemblage thinking (Deleuze & Guattari, 1987; Foucault, 1978).

Findings: Policymaking in the datafied state is an assemblage of many elements, a tangle of unstable factors, constructing policy into code and public services.

Value: Linear logical policymaking does not occur in the datafied state, instead, it unfolds in a chaotic, disorganised way. This paper aims to present an alternative structured approach to exploring and potentially disentangling the observations on policymaking.

K103 12:10 – 12:20

Adrienne Corless - School of Health Sciences

Title: Representing Midwives: A Central Midwives Board for Ireland in 1918

Abstract: Midwifery became formally regulated in Ireland from 1918, amid a very volatile and dynamic time of revolution and war. This presentation will ask: to what extent did maternity care of the 1910s and 1920s implicate gender politics, and how did this impact the role of women in public life as they endeavoured to represent themselves? The methodology for this research involves historical and archival research of primary sources, including state archives (such as regulatory boards, local government, and parliamentary debates), medical archives, military archives, and newspaper archives of Ireland). With the ratification of the 1918 Midwives (Ireland) Act, only formally trained midwives could legally provide maternity care 'habitually and for gain'. Regulation was enacted under the Central Midwives Board, comprised of seven men and four women. Board members were selected by government and the medical profession, amid a climate of revolt against British rule; the appointment of the women members was firmly decided by local government, despite activism by Irish nursing and midwife organisations to have their say. The objective for the new legislation was the eradication of traditional midwives in favour of midwives trained and certified to a specified standard; the result was the creation of a new dynamic in Irish maternity care, with authority for women's health bestowed, ultimately, upon the Dublin Castle administration. At a time when women were pushing boundaries to find their way to political independence, it can be said that maternity care and the autonomy of midwives came under new restrictions.

K103 12:20 – 12:30

Sandra Gillick Nevin - Department of Sports and Exercise Science

Title: Breaking the Speed Limits? Investigating cycling speeds of members of An Garda Síochána while deployed on mountain bike patrol

Introduction: The selection and training of suitable Gardaí for specialist duties such as mountain bike patrol requires a detailed awareness of the physical demands of the role. However, little is known about the physical workload of Gardaí on mountain bike patrol, with limited international evidence also (Lundälv et al., 2008). Therefore, the aim of this research was to determine the cycling speeds of this deployment. This objective cycling data will thereafter inform baseline standards for pre-entry to training and content of the 4-day training programme.

Methods: Thirteen (11 male and 2 female) trained garda mountain bike cyclists with a mean ± SD age of 35 ± 6 years and body mass of88 ± 13 kg volunteered to participate in the study. While on mountain bike patrol in a live authentic 12-hour working shift, Gardaí had a Polar M460 bike computer mounted on the stem o ftheir bike. All shifts (n=30) were carried out from November 2019to August 2020. A representative dataset was provided from a minimum of two consecutive work shifts and only shifts with more than one hour of recorded speed data were included.

Results: The average moving bike time per shift was 2 ± 0.4 hrs. Slow cycling speeds of ≤ 8 km/hr were recorded for 47 min. Average cycling speeds are described as >8-17 km/hr (Central Statistics Office., 2019; Lundälv et al., 2008) and were cycled for 53 min. Speeds of >17-30 km/hr and higher speeds of >30 km/hr were cycled for an average of 20 and 1 min respectively, with max speed recorded 40.6 km/hr.

Discussion: It was evident from this novel study that Gardaí endure a variety of physical challenges during mountain bike patrols. The repeated higher intensity bouts of cycling speeds intermittently performed during patrols highlight the need for baseline standards of physical fitness to undertake mountain bike training.

Limitations to this study was the lack of peer reviewed study was strengthened by being conducted in the live authentic working environment, albeit during the COVID-19 pandemic where patrols were varied and intermittent.

Conclusion: These findings concur with physical activity of policing duties found by Sorensen et al. (2000), where high intensity work is occasional, but an officer must be capable of responding at this level of intensity when required.

K103 12:30 – 12:40

Thanh Hoa Vo - Department of Science

Title: Identification of key miRNAs and miRNA-mRNA Regulatory Pathways associated with HER2-drug resistance in Breast Cancer by Bioinformatics Method

Abstract:

Background

Breast cancer poses a considerable health risk to women, andHER2-positive breast cancer is among the most aggressive subtypes. Given the availability of numerous HER2-targeteddrugs, therapeutic resistance remains a significant obstacle to the effectiveness of treatment. This study aims to investigate the underlying mechanism of HER2 drug resistance through miRNA analysis and identify potential targets for overcoming drug resistance.

Method: This study used three miRNA datasets (GSE47011, GSE197822,and GSE101841) and two RNA datasets (GSE132055 andGSE89216) obtained from the Gene Expression Omnibus (GEO)to conduct bioinformatics analysis. The R package "limma" and"edgeR" were used to obtain differentially expressed miRNAs (DE-miRNAs) and differentially expressed genes (DE-genes). To filter significant DE-miRNAs and DE-genes related to drug resistance, LASSO regression analysis was conducted. Potential target genes of DE-miRNAs were predicted by miRTar Base. The gene ontology annotation analysis (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway enrichment analysis for overlapping genes were performed using the DAVID tool. Additionally, a protein-protein interaction (PPI) network was established through the STRING database and visualized using Cytoscape software. Hub genes were identified through the Cytoscape software, and their prognostic value was evaluated via Kaplan-Meier plotter and GEPIA.

Result: We identified miRNAs associated with breast cancer HER2-drugresistance. The differential expression analysis resulted in the identification of highly DE-miRNAs and DE-genes related toHER2-drug resistance. The enrichment analysis revealed the involvement of biological and disease-associated pathways inHER2-drug resistance breast cancer. The prognostic value of identified hub genes was also assessed.

Conclusion: The interaction between miRNA and genes is a promising approach for investigating the underlying mechanism of HER2-drug resistance in breast cancer. Our study identified biomarkers and therapeutic targets that could enhance the effectiveness of targeted therapy for HER2-positive breast cancer patients.

K103 12:40 – 12:50

Foo Shen Hwang - engCORE

Title: Experimental Investigation of PCM Finned Heat Sink Prototype Effectiveness

Abstract: The current study explores the effectiveness of a finned heat sink prototype filled with phase change materials (PCM) in lowering the temperature rise of a singular cylindrical lithium-ion cell as it is fully discharged under 1C, 2C and 3C discharge rates. To measure the effectiveness of the built prototype, the battery was discharged under both natural convection conditions and with the battery fully encased in the prototype. Thermocouples were placed in two regions to measure the temperature rise. The first region was on the wall of the battery, T_Wall while the second region was on the outer wall in which the PCM was packed in, T_∞. Results indicated that the maximum temperature rise of the battery with the prototype is lower than the temperature rise under natural convection conditions by 6.80°C, 18.64°C and 31.14°C for1C, 2C, and 3C discharge rates respectively. This would indicate that the prototype would be far more effective in lowering the battery temperature at higher discharge rates. As heat is transferred outward radially from the battery, the dominant flow and thermal boundary layer is in the radial direction which in turn means that the characteristic length would be the diameter of the battery. Additionally, the Nusselt number, Nu_L was only calculated when the PCM temperature when T_∞ was above the solid temperature of the PCM which was 24.50°C. With such considerations in mind, the calculated average Nusselt number of the prototype was 10.17, 7.28 and 8.38 for 1C, 2C and 3Cdischarge rates respectively signifying a slug-flow pattern.

There was little correlation between the increase in discharge rates and the change in Nu number. Future work on the project would be based on the effectiveness of the prototype at a pack-level design to determine the best ways to optimize its heat transfer for larger packs.

K104 11:40 – 11:50

Katie Moore - Department of Nursing

Title: Inquiry in emerging research areas: the case for a scoping review of the menopausal experiences of women with intellectual disabilities.

Abstract: Increasingly, discussions about menopause are becoming mainstream and have gained traction with global media coverage. Notwithstanding this progress, women with intellectual disabilities have been unrepresented in the discourse. The literature on women with intellectual disabilities and menopause focuses on medical insights with little attention paid to understanding the impacts of menopause on women's psychological, physical and emotional well-being. Conducting an exploratory scoping review of existing literature is useful in emerging or new areas of research. Assessing the scope and extent of available studies can help to aggregate the evidence base, assess the quality of the available research and highlight the gaps that require further investigation. Given the paucity of literature documenting the menopausal experiences of women with intellectual disabilities, conducting a scoping review was considered a helpful adjunct for informing this research project. A comprehensive search was conducted by searching and reviewing the literature from multiple sources. Search terms were compiled based on keywords from the literature and final terms and search strings were iteratively developed. The titles and abstracts of 38 published works were screened against the study inclusion criteria and 19 articles were included for review. In total,17 studies were considered relevant for inclusion. Findings indicate that women have limited knowledge about menopause, its symptoms and the process of aging. The thematic gaps in the literature on the menopausal experiences of women with intellectual disabilities reveal that further research in this area is needed on the actual experiences of women with intellectual disabilities which is inclusive and tailored to the cogitative needs of the women themselves. Research is also needed to understand caregivers' and healthcare providers' needs in providing health education to women with intellectual disabilities and best practices for supporting women through menopause regarding information and symptom management, treatment, and health screening.

K104 11:50 - 12:00

Gulmira Tussupbekova - School of Education and Lifelong Learning

Title: An investigation of the role of adult learners in the co-creation of curriculum design within lifelong learning programmes in SouthEast Technological University (SETU)

Abstract: This paper will discuss a mixed-methods research study (PhD)that is examining how adult learners on lifelong learning programmes in Irish Higher Education can contribute to curriculum design through a co-creation model. Currently, there is limited empirical evidence on adult learners in curriculum co-creation in lifelong learning programmes (Erkkilä & Kortesalmi,2020; Shrivastava et al., 2022). Through a co-creation approach, the outcomes of teaching and learning are jointly negotiated to lead to a shared responsibility for learning, which results in a greater level of student agency and empowerment (Bovill, 2020). This paper will focus on the literature review process (traditional and systematic) and the development of the theoretical framework underpinning the research. It will also present the proposed methodological framework that will be used to gather data from adult learners in SETU. The overarching research question is: To what extent are adult learners co-creating the curriculum in lifelong learning programmes within SETU? This research is underpinned by a theoretical framework incorporating Social Cognitive Theory and Self-Determination Theory. A pragmatic, mixed-method research design will be used (Tashakkori et al.2021), over two distinct phases, to collect quantitative data (via an online survey) and qualitative data (via focus groups) from adult learners who are registered on lifelong learning programmes in SETU. In Phase 1, an online survey will be administered to a combined purposive sample of adult learners commencing on lifelong learning programmes (part-time and flexible) in SETU. In Phase 2, follow-up audio-taped focus group interviews will be conducted with a sample of the adult learners who engaged with the Phase 1 online survey. To conclude, this unique study will inform future educational provision and curriculum design within the HE sector. A key outcome of this research will be the development of a conceptual model and framework for the operationalisation of a co-creation model of curriculum design in SETU.

K104 12:00 – 12:10

Elisa Arnaud - Department of Science

Title: Effect of creep feeding (liquid milk, dry and liquid diet) on pig growth and intestinal structure

Abstract: Weaning (removal of piglets from the sow at ~28 days of age) is a critical period in the pig's life. Piglets are confronted with abrupt changes to their physical and social environment, as well as management and nutritional challenges. Weaning is therefore associated with reduced growth and is frequently accompanied by post-weaning diarrhoea in piglets. Solid or liquid feed can be provided to piglets during the suckling period to ease the weaning transition. This is referred to as 'creep feeding'. This study aimed to determine the effect of creep feeding suckling pigs on pre- and post-weaning growth and intestinal structure. After farrowing, 104 sows were assigned to one of four treatments: 1) Control, no creep feed, 2) Dry; pelleted starter diet provided to piglets from day (d)10-28, 3) Milk; liquid milk provided from d3-28, and 4) Mixture; mixture of liquid milk and starter diet (increasing as a proportion of the mixture as lactation progressed) from d3-28. At weaning, 566 pigs were grouped by sow treatment and formed into single-sex groups of 10-12 pigs. Group weights and feed disappearance were recorded at intervals up to slaughter. At d7 post-weaning, intestinal tissue was sampled from 40 pigs (10/treatment) for histological analysis. Data were statistically analysed using the mixed models procedure in SAS. Weaning weights were higher for pigs fed the Dry and Milk treatments compared to the Control. Slaughter weight was higher for pigs from the Mixture treatment compared to all other treatments. Villous height in the ileum (small intestine) was higher for pigs from the Dry and Mixture treatments compared to Control and Milk. In conclusion, providing a liquid mixture of milk and starter diet to suckling pigs increased villous height in the small intestine, likely increasing nutrient absorption. The latter likely explains the heavier body weight found at slaughter.

K104 12:10 – 12:20

Luke Connolly - engCORE

Title: Defect Detection and Localisation on light aircraft utilising an Unmanned Aircraft System with a stereo-vision camera

Abstract: Visual inspections of aircraft are a vital aspect of aircraft maintenance. They involve ground personnel walking around the aircraft and getting up on scaffolding or ladders in order to fully inspect the aircraft. A visual inspection however requires a significant amount of time to perform and may be prone to human error or complacency. Utilising an Unmanned Aircraft System (UAS) equipped with an onboard stereo-vision camera system has the potential to significantly reduce inspection time and enhance reliability. The stereo-vision camera records a video that includes metadata from an Inertial Measurement Unit (IMU). The IMU data includes the translation and rotation of the UAS, enabling the system to match the defects to their exact location in the video frame of the aircraft. The video recorded by this system is broken down into images, frame by frame, with the corresponding XYZ coordinate recorded in a CSV file. A machine learning model, trained on images of defects and non-defects on aircraft is used in order to find defects in the images, and match them to their associated XYZ coordinate. The model draws bounding boxes around the defects in the detected images for quicker identification of the defected area. Multiple models are compared, such as YOLO, Faster R-CNN, and RetinaNet. Hyperparameters of each model are varied to achieve the optimal model. These hyperparameters include the number of epochs, which determines the number of complete iterations through a dataset; the batch size, or the number of images used at a time; and the learning rate, which controls how quickly the model is updated during training. This model will then notify to the operator of where the defects are located on the aircraft. This proposed system offers a safe and efficient solution to aircraft inspections, reducing the risk of human error, and improving inspection accuracy.

K104 12:20 – 12:30

Kate O’Keeffe - Department of Management and Organisation

Title: From 'Lady Clerks to CEO': A Biographical Narrative of the Challenges, Opportunities, and Educational Programmes for Female Bank Workers since the lifting of the Irish Marriage Bar

Abstract: 2023 marks 50 years since the beginning of the removal of the Marriage Bar in Ireland. (Government of Ireland, 1973) Our joining the EEC acted as the impetus for this significant milestone in Ireland’s history of gender equality. The Bar had a legal basis only in the private sector; however, it was applied widely in both the Public Sector and in financial institutions. Mosca and Wright(2020, p. 6) assert that the Marriage Bar was ‘effectively institutionalised gender discrimination.’ The concept that the ‘family’ consists of a male breadwinner and a female care-giver was (is) deeply ingrained in Irish norms, both constitutional and societal. This had far-reaching economic and social consequences. The literature details the role of the Bar in ensuring employment for the ‘male breadwinner’ in the nuclear family. The establishment of the Bar, its role in society and its eventual abolition are traced.

However, there is a marked knowledge gap regarding the voices of women detailing how the lifting of the Bar impacted their professional, and broader, lives. This paper examines how the Marriage Bar limited women’s potential to advance to leadership positions in banking organisations. The obstacles, opportunities and the role of gatekeepers are also examined. The primary data on which this paper is based are semi-structured interviews with participants (both women and men) who have pursued careers in banking and finance in Ireland, since1973. The planning and conducting of interviews is aligned with the Biographical Narrative Interpretive Method (BNIM), which allows for ‘minimalist interviewer intervention.’ (Wengraf, 2001, p.112) Results of preliminary data analysis are outlined, with an emphasis on ‘emergent data themes, concepts, and dimensions.’(Gioia et al., 2013, p. 21) The researcher reflects on the emergent themes in preliminary data collection and reflexively considers her approach to subsequent data collection and analysis.

K104 12:30 – 12:40

Steve Daly - Department of Sports and Exercise Science

Title: Who is playing football? The pre-existing modifiable cardiovascular risk factors of participants in a community based social intervention, Football Cooperative.

Abstract:

Introduction

The need for gendered health interventions for 'at risk' men is established and gender competent strategies to engage men have previously been identified. Football Cooperative (FC) offers community-based recreational 'pick up' football that uses many of these strategies to successfully engage men. The purpose of this study is to profile the men to whom this intervention appeals, thereby ascertaining whether it reaches 'at risk' participants. Methods Purposeful sampling was used to recruit the participants via an FC gatekeeper. Aerobic fitness (Yo-Yo IR1), anthropometric data(height, weight, waist circumference (WC)) and self-report datavia survey (demographic, participation, physical health/activity, lifestyle, mental wellbeing and social integration) were collected following return to play following a 5-month layoff due to Covid-19restrictions.

Results

Of the 123 members of FC eligible to participate in the study, aerobic fitness, anthropometric and self-report survey data was collected from 60, 65 and 71 participants respectively. The participants were men (39.25 ± 7yr), married/cohabiting (84.6%),in full-time work (87.4%) with children at home (66.2%). The majority of participants (59.2%) had ≥4 of the 7 CV risk factors identified, including WC >94 cm 66.1%, poor aerobic fitness26.8%. The majority (90%), rated their health as good or better.

Discussion

While risk factors are present, currently the cohorts age may be a mitigating factor. FC therefore, may be preventative initiative to future and indeed current risk for this cohort.

Conclusion

The participants of this intervention can be considered a moderately 'at risk' group and therefore FC may be a viable health promotion measure. However, the cohort are predominantly married and in full-time employment. While valuable for these men, further research is needed to improve the reach to more vulnerable cohorts (single/lower socioeconomic men) with greater risk.

K104 12:40 – 12:50

Samantha Makiwa- Department of Health Sciences

Title: A systematic review of the challenges experienced by General Nurses working within the addiction services

Abstract

Background: Studies have shown that the prevalence of drug and alcohol addiction has increased over the past few years (Department of Health 2016, Irish Medical Organisation 2015). Consequently, addiction to these substances has detrimental effects on the physical and mental wellbeing of the affected individuals; hence they may require admission to an addiction treatment service. However, addiction nursing is a rare speciality with very few nurses specialised in that field particularly in Europe (Dalal 2020). Thus, due to the scarcity of specialised addiction nurses, General Nurses (GN) are employed to work in most addiction treatment services (Public Health England 2017).

Aim: This study aims to explore the challenges experienced by General Nurses working within the addiction services. Methodology: An interpretative qualitative systematic review of seven studies was conducted using a meta-ethnographic approach (Noblit and Hare 1988).

Results: Degree of knowledge on addiction nursing, challenging behaviour by clients such as poor compliance to treatment, legal issues and aggression, physical and psychological work environment, stigma and nursing practise issues were identified as the challenges experienced by general nurses working within the addiction services.

Conclusion: This study examined a contemporary problem in the management of SUDs. Hence, it is relevant to all stakeholders in the addiction treatment sector including program developers and course leaders at nurse training institutions, leadership and management at addiction treatment services as well as nurses working within and outside the addiction services. Therefore, the findings form this study can be the starting point in the mitigation of the challenges experienced by nurses, thereby improving the retention of nurses and thus improving the quality of care at the addictions services.

K103 14:00 – 14:10

Katie Scallan - Accounting and Economics (Online)

Title: An Ethnography on Board Meetings

Abstract: What boards of directors actually do remain a literature lacuna (Brennan, 2021; and Watson et al., 2021). To address this literature gap, the objective of this ethnography is to observe and explore boards-in-action (Samra-Fredericks, 2000; Brennan,2021; Watson et al., 2021). To fulfil the research objective fifty-eight boards were invited to participate, six accepted. Subsequently, forty-one board meetings were observed. My PhD is structured as three papers.

Paper 1 responds to the difficulty in gaining access to the blackbox of board meetings. By way of empirics this paper reports on fifty-eight approaches and the character of interaction. It makes two contributions: first to identify the circumstances required for access to be achieved, second to theorise on the nature of boards from my reflective account of approaching, attempting, gaining, and sustaining access to board meetings.

Paper 2 explores board roles with a temporal lens. Drawing on the conceptualisations of Lee (1998); Virilio (2002); Fisher (2004), and Augé (2015), this paper explores board roles across three temporal horizons, past, present, and future. The exploration suggests that boards spend considerable resources reviewing the past, with boards struggling to devote time to the present or the future. External forces, including regulators, legislators, and wider society assess the performance of the board based on past actions, influencing how boards allocate their time.

Paper 3 takes the affordance from the ethnographic method to explore the emotions in board meetings. Inspired by the conceptualisation of emotional labour by Hochschild (1983), advanced by the work of Boyle and Healy (2003), this paper explores the emotionally-laden character of board meetings. This allows for a parsing between the emotional labour of board meetings where the board and its members discharge their function through performances of emotion, and the actual raw emotion that surfaces during the meetings.

K103 14:10 – 14:20

Komal Komal - Department of Health and Science (Online)

Title: Design and development of embroidered electrodes for monitoring epilepsy seizures

Abstract: Epilepsy is a chronic neurological condition characterized by recurrent seizures. Current seizure detection devices for everyday use designed to support real time monitoring rely on gel-based electrodes to reduce skin-electrode impedance. However, these gel-based devices may cause skin irritation and associated discomfort with long-term use and can lead users to abandon them because of this discomfort or the associated stigma with the visibility of having to wear them. To address this issue, the objective of this research is to design an embroidered textile-based smart garment using conductive thread embedded with electronic circuitry for monitoring epilepsy seizures. Such a garment offers a potential solution to issues of discomfort and compliance with long term monitoring for pre-emptive interventions in relation to seizure identification. The design of embroidered electrodes were investigated using technical embroidery machine (ZSK stickmaschinen machine), in combination with EPC-win software. An experimental research has been completed by utilizing such functionality to design and develop textrodes for various embroidery patterns, sizes, shapes, stitch programs, and stitch densities. A sample of novel textrode were designed in a circular shape with a diameter of 20mmpresented (see Figure.1). Madeira HC-12 conductive thread with resistivity of less than 300Ω/m was utilized for printing electrodes. When designing textrodes two approaches were utilized. The first approach involved normal flat stitch which produced 2-D textrode. The second approach added additional foam between the fabric and embroidery or used looping moss-stitch to provide 3-Dtextrode to enhance point of interest measurement. This research highlights the importance of embroidered electrodes as a viable solution to reduce discomfort and address stigma associated with the wearing medical devices. The next steps in the research is to do morphological tests and cross validate the performance of textrodes compared to standard ones.

K103 14:20 – 14:30

Kara Lynch - healthCORE (Online)

Title: Nutrition Knowledge, Behaviors and Attitudes of Female 10mPlatform, 3m Divers, and Coaches

Abstract: The Olympic sport of diving has evolved in recent years with an increase in participation and degree of difficulty of dives. Even with the increase in number of competitive divers around the world, there is limited published research for the sport. Moreover, the current published research highlights the gap for nutrition focused literature. Therefore, in order to identify any barriers to nutrition, the participants knowledge, attitudes, and behaviors will be explored. Athletes in leanness- demanding sports, including diving, have an increased risk for relative energy deficiency (RED-S) and developing eating disorders because they are often characterised by their physique and physical appearance (Burke, 2014).Additionally, as the discipline of diving is an artistic, judged sport, athletes are often susceptible to RED-S which can decrease muscle strength and increase injury risk (Mountjoy, 2014). As a result, the current nutritional intake of female divers will be investigated to assess energy availability, assess if energy intakes match typical training requirements, and identify if female diversare at risk for disordered eating and eating disorders. Due to the difficulty of dives performed and the 33 km/hr speeds achieved upon water entry, overuse injuries can occur (Jones,2017). Literature presents that the incidence of injuries is higher for platform divers compared to swimmers and is more common in practice than competition (Jones, 2017). Due to the intensity of one dive, the current number of repetitions to achieve peak performance may be too high for divers to train effectively and without injury. As a result, it raises the necessity to further investigate the nutrition knowledge and behaviors of divers and coaches in order to inform the design of safe, performance-enhancing training programmes. Moreover, nutrition knowledge will be explored to identify if there is a relation between nutrition knowledge and injury risk.

K103 14:30 – 14:40

Danielle Wykes - Department and Nursing and Healthcare (Online)

Title: "We don't know enough as healthcare professionals". Midwives experiences of supporting women with intellectual disabilities to access maternity services in Ireland

Abstract:

Background: There is a paucity of research at national and international level on maternity care for women with intellectual disabilities. With recent transitions in rights-based policies and a shift to promoting inclusive healthcare, there is a current need to understand the support women with intellectual disabilities require and experience when accessing maternity care.

Aims and objectives: The aim of this research is to explore the support women with intellectual disabilities currently receive while accessing maternity care in Ireland through the perspectives of midwives and public health nurses.

Description of innovation: A multimethod approach will be applied in which the data will be generated using a Group Concept Mapping (GCM) approach enables participants to engage in research using an online platform. The GCM software generates both qualitative and quantitative data. During the six-stage approach, participants respond to one open-ended statement which will generate multiple statements that are subsequently rated for importance and relevance by the participants. Ethical approval has been granted by the HSE and the researchers institute for this study.

Impact of Innovation: The application of Group Concept Mapping will enable midwives and public health nurses to engage with the research at a time convenient to them. The methodology enables the researcher to reduce participant burden during a global pandemic. In light of the recent restrictions the researcher felt it was essential to use an online methodology that facilitates research during the pandemic. Group concept mapping also enables six visual graphs to be created digitally leading to visually emphasised conclusions of the data.

Conclusions: Thirty-Three Midwives and public health nurses completed the study and provided an insight into the care currently provided to women with intellectual disabilities. Seven overarching themes were found that impact and can lead to future improvements in maternity care.

K103 14:40 – 14:50

Alfred Ocaka - engCORE (Online)

Title: Empirical Analysis of the Impact of Cyberattacks on the performance of Programmable Logic Controller

Abstract: Programmable Logic Controllers (PLCs) serve as the backbone of critical infrastructure monitoring and control, with widespread applications in nuclear plants, power generation, water treatment facilities, and oil and gas operations. However, the advancement of industrial automation and the emergence of Industry 4.0 has intensified concerns surrounding PLC security. Consequently, vulnerability assessments and penetration testing have become indispensable for safeguarding these systems and mitigating the risk of cyberattacks with potentially catastrophic consequences. This study implements a wide range of attacks, including Code Injection, Man in the Middle, and Denial of Service attack on a Siemens PLC. The study further scrutinises the impact of these attacks on the performance of the PLC with a view to developing effective security measures to mitigate cyber risks in Operational Technology (OT) systems. The study employs throughput and round trip time as the key metrics to evaluate PLC performance under normal conditions and during cyberattacks.

K103 14:50 – 15:00

Kristian Jocher - healthCORE

Title: H-DISC Study: An investigation into Hiker behaviours, Injuries and Footwear Habits

Abstract:

Introduction: In a world that is increasingly sedentary (1, 2), there is a global need to maintain the performance of PA for QoL purposes. Therefore, it is important to investigate hiking, where outdoor PA is associated with major health benefits (3). To increase engagement with hiking-based activities, the issues and risks with the activity must first be investigated.

Methodologies: A cross-sectional design was used to examine hikers. The questionnaire observed the demographics, behaviours, injuries, and footwear habits of hikers. Participants were recruited through organisations/groups on social media, emails and word of mouth(n =57), 6 participants were excluded (1x drop-out, 2x incomplete,3x chronic illness).

Results: Mean age = 45yrs (± 16), mean height = 1.71m (±0.16), mean weight =75.42kg (±14.22), 53% reported as biological male, 47%of respondents reported as biological female. It was also observed that 68.42% of those who responded performed the activity over all four seasons of the year. Injury incidence among hikers was 35%, 5% were unsure if an injury in previous 12 months. Foot (23%) and ankle (19%) were the most injured sites. Traditional shoes were most prevalent among hikers (84.21%).Minimalist shoes (7.02%), true barefoot hikers (3.51%), and mixing of traditional and minimalist shoes (5.26%) were less frequent.

Discussion: Preliminary examination of the data highlighted trends in hiking population from Ireland, UK, US and NZ. This initial examination may highlight habits that may be similar to that of trail runners (4).

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K103 15:00 - 15:10

Tapiwa Zengeza - enviroCORE

Title: Exploring the effect of G-E-M interaction on NUE and quality of Oats

Abstract: The Farm to Fork Strategy is at the heart of the European Green Deal aiming to make food systems healthy, fair and environmentally-friendly. Consequently, there is need to redesign our food systems which consume large amounts of resources and do not allow fair economic returns and livelihoods for all actors, in particular primary producers. There is therefore, the need for variety specific nitrogen recommendations by exploring nitrogen use efficiencies. A field experiment was conducted at Teagasc Crops Research Centre in Carlow with the aim of understanding genotype and management interaction on Nitrogen Use Efficiency(NUE) and grain quality traits. Three autumn sown oat varieties were tested under six nitrogen regimes (0-180 kg/ha), two split types (3 equal splits and 2 equal splits) and two growth regulator doses (100% and 50% rate) in a split plot design. Phenological, physiological, grain quality, NUE and UAV data were collected. Several responses to nitrogen regimes, growth regulator doses and split applications were found on grain quality, individual yield components and nitrogen responsiveness. All yield, quality and nitrogen parameters studied were significantly influenced by total nitrogen applied ($p < 0.05$) except for hull ability and kernel content. Growth regulator did not significantly influence grain yield, thousand seed weight, screenings, harvest index and agronomic efficiency. Variety significantly influenced all yield, grain quality and nitrogen parameters studied ($p < 0.05$), emphasizing the importance of varietal choice when growing oats. More work is being conducted on nitrogen uptake and utilization efficiency in oats. Future studies are required to factor in seasons, genotypes and environments.

K104 14:00 – 14:10

Marta Mroczkowska - enviroCORE

Title: Cutin coating made from tomato waste as a treatment for improvement of hydrophobic properties of fish gelatine and starch blend bioplastic.

Abstract: Valorisation of food by-products is an important step towards sustainability in food production. Tomatoes are the most processed crop in the world; 160 million tonnes of tomatoes are processed every year, of which 4% is waste. This translates to 6.4million tonnes of tomato skins and seeds. Currently, this waste is composted or used as low value animal feed, but higher value could be achieved if this waste stream is re-appropriated. Plant cuticle is a membrane structure found on leaves and fruits, including tomatoes. The main function of plant cuticle is to prevents excessive water loss from the internal tissue of the plant. Plant cuticle is mainly composed of cutin, which can be recovered from the tomato peels by pH shift extraction. Due to cutin's water-repellent properties, it is an ideal raw material for the production of water-resistant coating. In this study a cutin-based coating has been formulated and applied on biomass-based bioplastic (made from starch and gelatine blend) with poor hydrophobic properties, to improve them. The biomass-based bioplastics have good mechanical properties but their hydrophilic nature results in poor water barrier properties. The aim of this study is to mitigate this by incorporating a hydrophobic surface treatment, derived from cutin extracted from tomato peels. Preliminary studies have shown improved water vapour permeability rates of the bioplastics by74% and percentage swelling of the bioplastic by 84%, when treated with the cutin coating. Using ingredients generated from by-products from food processing (circular economy) has great potential for the generation of bioplastics with physio-chemical properties that can compete with petroleum-based plastics. These bioplastics have the potential to address the growing market demand for sustainable alternatives for food packaging.

K104 14:10 – 14:20

Tapiwa Nyakauru - Department of Science

Title: Relative gene expression of metallothionein and phytochelatin synthase genes in Water Lettuce (Pistia stratiotes) subjected to copper.

Abstract: Water lettuce (Pistia stratiotes) is an aquatic plant native to South America and has been identified as a heavy metal hyperaccumulator plant. Several studies have shown the ability of P. stratiotes to accumulate toxic concentrations of heavy metals without showing any symptoms of abiotic stress, and this is important in alleviating heavy metal contamination from water. In several plants, exposure to heavy metals results in the activation of bioaccumulation mechanisms such as the production of metal chelating peptides including metallothioneins and phytochelatins. Metallothioneins (MTs) are gene-encoded polypeptides that have highly conserved cysteine motifs that contribute close to 30% of the polypeptide chain. Phytochelatins(PCs) are proteins rich in cysteine residues and are synthesized from the substrate glutathione by phytochelatin synthase (PCS), a gene-encoded enzyme. Several studies have demonstrated that MTs and PCs participate in metal tolerance processes in plants because of their capability of binding to metal ions such as copper and cadmium using thiol groups present in cysteine residues. While the responses of MT and PCS genes of many plants exposed to heavy metals are well studied, those of P. stratiotes are unknown. The aim of this study was to investigate the response of putative, novel MT and PCS genes of P. stratiotes in response to copper exposure. Specific objectives were to design and optimize novel real time PCR primers for the amplification of reference and target genes, assess the stability of reference genes, and assess expression changes of MT and PCS in response to heavy metal exposure. Up-regulation of the MT and PCS in P. stratiotes in response to exposure to copper was observed, demonstrating the potential function of both genes in P. stratiotes' tolerance to copper.

K104 14:20 – 14:30

Dylan S. Edirisinghe - engCORE

Title: Droplet impact modelling to predict the rain-induced Erosion of wind turbine blades

Abstract: The wind turbine industry has grown rapidly since the last decade progressing towards manufacturing giant offshore turbines with larger blades. Lengthy wind blades result in high tip speed whereas the impact of rain droplets is significant in blade erosion. Even severe erosion damage is recorded in offshore turbines due to heavy rainfall. Eroded blades degrade the turbine performance, reducing the Annual Energy Production (AEP) by up to 5%.Periodic repairing and new coating solutions for the leading edge of wind blades are the main precautions against rain erosion. Therefore, this research was conducted to understand the droplet impact using the CFD analysis, as a preliminary step for estimating the repair frequencies and exploring the new coating systems. Typical rain generally consists of 1-5 mm droplets, whereas this study focused on the single impact of a 2 mm drop. The impact speed was determined as 100 m/s considering the terminal velocity of rain and the tip speed of the blade. CFD transient simulations were carried out using the Ansys CFX for100 ns. Mesh-independent tests and time-step independent tests were done to increase reliability. Pressure distribution was mainly analysed followed by water volume fraction and water superficial velocity. The highest pressure of 50 MPa was recorded immediately after the impact at the impact centre. Then the high-pressure region moves outwards along with the droplet contact circumference as the droplet spread over the surface. Furthermore, a relatively high velocity (~350 m/s) was observed at the spread circumference indicating the lateral jet, which is even higher than the impact velocity. Furthermore, the study is extended for the impact loads by multiple droplets while taking the count of structural analysis using the CFD pressure profiles as the boundary condition.

K104 14:30 – 14:40

Rebecca Synnott - Department of Science

Title: Genetic tools for the conservation and management of native and invasive squirrel populations

Abstract: Debates in Britain and Ireland over native and invasive species often centre around the native red squirrel (Sciurus vulgaris) and the invasive grey squirrel (Sciurus carolinensis). Despite the red squirrel's recent rebound in Ireland, population reinforcement is often needed to maintain viable populations due to deforestation-induced isolation. Management of grey squirrels is also necessary to support red squirrel conservation efforts. Here, we demonstrate, via two case studies, how genetic tools can aid the conservation and survival of native red squirrels and control of invasive grey squirrel populations. In the first case study, we assessed the success of a red squirrel translocation (a conservation tool) conducted nearly 20 years ago from PortumnaCo. Galway to recipient sites in West Co. Galway and Co. Mayo. Our use of mitochondrial DNA (mtDNA) and microsatellite DNA (nrDNA) analysis revealed a decline in genetic diversity in the donor site since the translocation, as evidenced by a reduction in the number of mtDNA haplotypes and relatively low levels of genetic diversity. We suggest that further translocations may be necessary to conserve genetic diversity within the recipient sites, and further monitoring of the donor site may also be required to ensure its long-term viability. The second case study evaluated the genetic diversity of the grey squirrel population in North Wales and the impact of decade long population control efforts. Analysis of mtDNA and nrDNA revealed high genetic diversity even after culling efforts. These findings suggest that current control efforts may not be sufficient in reducing genetic diversity to a level that contributes to a long-term population decline. Other strategies, such as the continued restoration of native predators like the pine marten (Martes martes), may provide more effective long-term ecosystem-based solutions.

K104 14:40 – 14:50

Andrew O’Regan - Department of Science

Title: Development of a crop nutrition strategy which includes foliar fertilisers

Abstract: A greenhouse trial was designed to determine if similar plant performance could be achieved through the application of foliar urea as granular urea. The trial also investigated four different application rates, based on an advised recommended rate taken from Teagasc. The trial found the highest yield on soil came from granular, applied at the recommended rate. Straw production from foliar treatments was less than granular suggesting foliar damage may have taken place. Forage analysis of the grain determined that granular is more suitable in improving grain protein content while foliar produced improved sugar, starch and fat contents. Little difference in production was seen from lower application rates of both granular and foliar suggesting foliar fertilisers may be just as effective as granular when applied in small concentrations. The trial also investigated environmental factors by determining the nitrate-nitrogen content of moisture samples from each treatment. High nitrate-nitrogen from granular treatments compared to foliar indicate a higher potential for loss through leachate but also suggests improved nutrient availability compared to foliar. Authors have previously noted that foliar fertilisers improve crop performance when applied frequently in low concentrations, the findings of this trial would support further research to investigate this claim. One issue noted form this trial was the poor early canopy establishment due to later than advised application of N fertiliser. This would therefore support the design of trials to investigate a suitable method to develop a suitable canopy for foliar uptake.

K104 14:50 – 15:00

Elizabeth Barry - Department of Arts

Title: A Gadamerian Hermeneutic Reflection of Saint Francis of Assisi

Abstract: Saint Francis of Assisi is one of the most respected religious figures in Roman Catholic history. Various forums and social media platforms, have claimed and celebrated Francis as queer. Queer for the context of this inquiry refers to the non-normative, the sexually and religiously transgressive, the boundary crossers, and the non-conformers, and to a type of awareness and responsiveness that challenges established religious practices and spiritual norms. My research aim will explore these claims of queerness using queer methods and the philosophical hermeneutics of Hans-George Gadamer. This paper will concentrate on how Gadamerian hermeneutics, as a mode of research inquiry, has the unique capacity to explore the complexities of my research phenomenon within its own historical and cultural context.

A discussion on the philosophical underpinnings of the Gadamerian hermeneutical approach will include significant elements such as dialogue, prejudices, and fusion of horizons. Gadamer's approach will liberate texts on Francis from any fixed meaning, as he claims there can be no universal truth just endless possible meanings as everyone has their own unique perspective.

As a research approach, it offers possibilities of reinvention and reinterpretation and is open to other ways of thinking and behaviours, to other cultures, and to other ways of viewing the world. In his magnum opus, Truth and Method, Gadamer (2004) provides the analytical tools that make it possible to interpret and understand texts from someone else's perspective, providing insight into why some queer theorists have embraced Francis as having a queer side.

References:

Manning, Kathleen, 'Upstart from Assisi: St. Francis Is Probably Our Most Popular Saint. But Do We Know Who He Really Is?(Cover Story).' U.S. Catholic, 82 (10) (2017), pp. 12-17.

Hans-Georg Gadamer, Truth and Method, (London: Continuum,2004).

K104 15:00 – 15:10

Sarah Bates Evoy - Department of Education

Title: A glimpse into a PhD project examining the professional identities of Irish Further Education and Training practitioners

Abstract: The presentation will discuss in brief an SETU PhD research project that is in its final stages. The project examined the professional identities of Further Education and Training (FET)practitioners in the Irish FET sector and considered the impact ofpost-2012 sectoral changes upon those identities. The theoretical approach was informed by the work of Margaret Archer in relation to identity, agency and structure. The methodological design was underpinned by a critical realist position and involved an inductive, grounded theory informed approach to the investigation of the research issues. The Irish Further Education and Training (FET) sector, as a distinct and official sector of the Irish national education system, came into being in 2013. It provides full and part-time, accredited and non-accredited, formal and informal education and training opportunities to groups and individuals over the age of 15.Accreditation is offered between Level 1 and 6 on the National Framework of Qualifications. Just as Irish FET programmes are diverse, so too are FET practitioners in terms of their own education, training, professional qualifications, career goals and values and beliefs about learning and teaching. Research on the post-2013 sector as a whole, and in particular research into current Irish FET practitioners 'identities, is limited. The project consisted of three data collection stages. Contextual data in relation to the Irish FET sector and issues of importance to FET practitioners was gathered through Stage 1, an initial small consultation, and Stage 2, a larger on-line survey. Narrative interviews were then conducted during Stage 3 which allowed fora more in-depth exploration of the professional identities held by FET practitioners and the impact of sectoral changes upon those identities. The presentation will include a very brief overview of the approach taken to the research

Poster Abstracts

01 Nidhi Piplani Kapur - Department of Arts

Pushing Boundaries through Borderless Education- The power of Internationalisation at Home

In Irish third-level education, traditionally, a small minority of students have benefited from an international mobility experience as part of their studies through international exchanges, Erasmus programmes, etc. Since most students are not able to access mobility opportunities, Internationalisation at Home (IaH) helps them build their global competencies at their home institution. IaH seeks to provide international and intercultural learning to the majority who cannot take advantage of the mobility opportunities due to socio-economic, physical, or personal circumstances or alack of interest or awareness about IaH, defined as 'the purposeful integration of international and intercultural dimensions into the formal and informal curriculum for all students within domestic learning environments' (Beelen & Jones, 2015).There has been a strong emphasis on the need for IaH through the curriculum in the Department of Education and Skills International Education Strategy for Ireland 2016-20 where internationalisation has primarily been focused on international student recruitment and student mobility. In the light of the above background, the researcher's PhD, funded by the Irish Research Council, explores 'Embedding a culture of internationalisation into the curriculum through "Internationalisation at Home (IaH)" in the changing context of Higher Education in Ireland.' This poster presentation will encompass a snapshot of the researcher's project, emphasizing the power of IaH in fostering global competencies among third-level students in Ireland. It will highlight the benefits and impact of IaH that can be useful for students, academic staff, the international office, and senior management involved in third-level education.

References:

Beelen, J. and Jones, E. (2015) Redefining IaH. In Curaj, A.,Matei, L.,Pricopie, R., Salmi, J., Scott, P. (Eds.) The European Higher Education Area: Between critical reflections and future policies. Springer International. pp. 67-80.

Department of Further and Higher Education, Research,Innovation and Science (2020) Irish Educated Globally Connected an International Education Strategy for Ireland, 2016-2020. URL:https://assets.gov.ie/79122/0acd9733-b0fd-4f91-bdc4-38056bdce974.pdf

02 Ornella Yondjin Ngamy - socialCORE

Defining Local Food

The demand for local food is rising related to concerns about food production practices, the degree of transparency in the supply chain, environmental as well as social and economic aspects(Feldmann and Hamm, 2015).However, it has been consistently highlighted that there is no single definition for the term 'local food' (Carroll and Fahy, 2015).The numerous parameters used to define local food include geographic parameters like place, distance or geographic boundaries; characteristics of the product or producer; distribution channels and production processes. In some cases, related benefits which are either environmental, social, economic or cultural are used to frame an understanding of local food. Adding to the inconsistency in defining local food and the numerous parameters utilised local food is understood and defined differently by consumers, producers and retailers (Vargaset al., 2021). The multiple meanings attributed to local food from these different stakeholders presents local food as a complex term. This complexity leads to difficulties in identifying local food by consumers, difficulties for producers and retailers to provide products that meet the expectations of consumers impacting the progress of the entire local food sector (Eriksen, 2013). Acknowledging the drawbacks of an inconsistent definition of local food is at the core of this work. As a proposed solution, a taxonomy provided by Eriksen (2013) will be presented defining local food based on geographical proximity, relational proximity and values of proximity to draw out these inconsistencies in definition from the perspectives of the different stakeholders identified. Geographical proximity explains local food in terms of geographical location or distance. Relational proximity refers to social connections brought about by local food. Values of proximity is simply defining local food using special attributes. These three proximities will be presented to provide a framework for an expanded understanding of how local food is interpreted.

03 Sarah Egan - Department of Nursing & Healthcare

An exploration of risk feeding within Intellectual Disability Services in Ireland: A 'Soft Systems' study.

Background: Dysphagia is associated with serious health complications for people with an Intellectual Disability (ID). Despite this, the literature suggests that 'risk feeding' is a neglected and poorly understood concept. In addition, decisions to support a person with dysphagia are multifaceted in nature and do not appear to have a universal approach within the ID service. Aim and Objectives: The aim of this study is to explore and analyse the experiences of the Multi-Disciplinary Team (MDT in relation to risk feeding within ID services. The objectives are to:(1) analyse and define the concept of risk feeding; (2) develop a situational analysis, rich picture and conceptual model of the service referenced to risk feeding; (3) compare the conceptual model of the service with its service operation; and (4) develop a multidisciplinary guideline for risk feeding within ID services. Method: A 'Soft Systems' Methodology (SSM) using a qualitative approach was employed. One to one interviews with Twelve(n=12) members of the MDT were undertaken. Thematic analysis was used to analyse the data. Ethical approval was granted by Waterford Institute of Technology and the HSE Research ethics committees. Findings: Results found that risk feeding is a poorly understood concept within ID services. A lack of clarity relating to MDT roles and responsibilities that is affecting decision making related to risk feeding within the ID service was acknowledged. The findings also highlight the absence of local and national Policies, Procedures, Protocol's and Guidelines in relation to risk feeding. Poor communication, limited access to MDT services, and poor information provision was also highlighted. Conclusion and impact: This study is both timely and relevant in relation to risk feeding and references micro, meso and macrolevels for the development of a MDT guideline for risk feeding in order to implement effective strategies to support services users with dysphagia within the ID service.

04 Jiao Zhang - enviroCORE

The optimization of solid-state fermentation parameters for brewers' spent grain protein extraction and the assessment of their techno-functional properties

Brewer's spent grain (BSG) is the residue left after the separation of wort during the beer-brewing process. Ireland has a strong brewing industry producing significant amounts of BSG. Although this by-product has been reported to have between 14 to 26%proteins it is normally treated as waste or animal feed. The aim of this work is to isolate bioactive hydrolysates from BSG, and then explore its bioactivities. For that, two different methods we redeveloped to produce biologically active BSG protein (BSGP) and its hydrolysates. The direct extraction method led to the highest yields of 66.41 ± 0.37% and was adopted for the subsequent extraction process. After extraction, obtained protein and its associated enzymatic hydrolysates were evaluated for blood pressure regulation activity and antioxidant properties. However, the intact protein exhibited relatively higher bioactivities than its associated hydrolysates, which is interesting from the brewing industries' perspectives since it might be possible to recover peptides with potent bioactivities without hydrolyzing. To confirm this hypothesis, a solid-state fermentation model on BSG was performed. The fermentation process was optimized with single-factor investigation and surface response methodology as 50%initial moisture content, 10% inoculum concentration, pH 5.8, and fermentation at 38 degree for 6 days. BSGP and hydrolysates extracted with the optimized fermentation parameters were evaluated for various techno-functional properties. Overall, it can be concluded that it is possible to extract good quality proteins from BSG and that the heterogeneous nature of this by-product presents the potential to be used for the extraction of a variety of proteins that might be of interest to the pharma, food, or cosmetic industries.

05 Emma Fuller - enviroCORE

Investigating the core microbiome associated with Common Alder (Alnus glutinosa) trees to isolate potential bio-agents against the Alder dieback pathogen; Phytophthora alni

Alnus glutinosa, also known as the common or black alder, is indigenous to Ireland and has significant ecological value. Alder is a hardy species that can thrive on a wide range of sites, from mountainsides to riverbanks and lakeshores to wetlands and the most infertile soils, primarily due to its ability to fix nitrogen. However, Alder dieback, a stem and root rot disease caused by the soil- and water-borne pathogen; Phytophthora alni, is posing a threat to alder trees, and has spread throughout Europe. Forest trees exist in close association with a diverse range of microbial organisms that play a crucial role in maintaining tree health and ecosystem functions. This association can be mutualistic, parasitic, or symbiotic. Combined, these microbial communities associated with the tree is known as its microbiome. The microbes inhabiting forest trees that establish symbiotic associations with tree roots could enhance nutrient uptake and promote resistance to various biotic and abiotic stresses. In addition, microbes within tree tissues; known as endophytes, and on the surface of the trees; known as epiphytes, have the ability to help promote pathogenic resistance, as well as stimulate growth and development of trees. The use of beneficial microbes and bio-agents from Alder trees and their associated rhizospheric microbiome presents a promising approach for disease control. Therefore, this study aimsto:(i) investigate the core microbiome of Alder trees,(ii) identify, and isolate culturable microbes to perform in-vitro antagonistic studies against P. alni, and(iii) test the efficacy of selected microbes for their potential use as bio-agents/beneficial microbes by performing in-planta assays. The findings of this study will advance our understanding of the Alder microbiome, and can result in the development of a sustainable and eco-friendly approach for controlling Alderdieback, thereby improving the health and productivity of Aldertrees within the ecosystem.

06 Amy Whelan - Management & Organisation

Examining the drivers of Leisure and VFR passengers sustainable consumer behavioural intention in the Irish aviation industry.

This poster will present a comprehensive study on the drivers of sustainable consumer behaviour in the Irish aviation industry. It aims to understand the underlying factors that facilitate a consumer's sustainable consumption habits related to aviation and its impact on the achievement of the United Nations' Sustainable Development Goals (SDGs). Adopted by all UN member states in 2015, the SDGs represent a global call to action to end poverty, protect the planet, and ensure peace and prosperity for all by 2030. The research takes a mixed methodology approach, combining focus groups in phase 1 and a survey in phase 2. The focus groups will be used to elicit qualitative data to understand the attitudes and perceptions of consumers towards sustainable aviation and tourism in Ireland. The survey in phase 2 will then provide a more comprehensive and quantifiable understanding of the topic. The results of this study will contribute to the advancement of knowledge in the field of sustainable tourism and will provide insights into the drivers of sustainable consumer behaviour in the Irish aviation industry. It is expected that the findings of this research will have practical implications for industry stakeholders and policy-makers in their efforts to promote sustainable tourism and achieve the SDGs in Ireland.

07 Denise McAllister Wylie - Department of Humanities

Pushing Boundaries for Inclusive Internationalisation in Irish Higher Education

Inclusive internationalisation is becoming an increasingly important concept in higher education institutions, as it recognizes the value of equality, diversity and social inclusion in higher education. The benefits of making internationalisation activities more inclusive are multifaceted, and they can contribute to achieving the United Nations' Sustainable Development Goals 4,5 and 10. These goals focus on providing quality education, promoting gender equality, and reducing inequalities, respectively. This poster presents a research project aimed at understanding how internationalisation and inclusive education are interpreted and implemented in Irish higher education institutes. The research employs a qualitative approach, including interviews and focus groups with academic staff and management, students, and other stakeholders, as well as collation and analysis of national and institutional policy documents. The project seeks to understand how inclusive internationalisation can be positioned at the heart of SETU, influence institutional and national strategy and policy, and focus on inclusive approaches to engaging with students and staff in relation to teaching, learning, and support. The study also highlights the importance of collaboration and partnership building, cultural sensitivity, and the role of leadership in promoting inclusive internationalisation. The poster concludes by emphasising the potential impact of the study in providing a new model for positioning 'inclusive internationalisation' at the heart of SETU, influencing institutional and national strategy and policy, and promoting an inclusive approach to engaging with students and staff in relation to teaching, learning, and support. The findings of this study can inform the development of more effective strategies and approaches for promoting inclusive internationalisation in Irish higher education, which in turn can contribute to achieving sustainable development goals, promoting social inclusion and cultural diversity, and preparing students for a globalised world.

08 Steven Suan Zhu - gameCORE

High Resolution Agent Based Model For Viral Progression And Prediction Policy Optimization at Municipal And Sub-municipal Level

Thanks to viral mutations of Omicron with its extremely high transmission rate and relatively low mortality rates and herd immunity at the start of 2022, the impact of the ongoing pandemic becomes minimized toward the end of 2022. However, such mutations happened purely based on luck, and this pandemic could have lasted much longer and more seriously. To prepare for another more grievous one, a comprehensive simulation for viral pandemic progression at any municipal level that facilitates policymakers anywhere in the world is urgently needed. The onset of Covid19 has exposed many vulnerabilities in the policymaking by governments around the world, as well as a lack of precise modeling of infection with excellent predictive power to corroborate policy-making initiated by the governments. The inadequacy of good modeling is at least partially if not significantly due to the simplicity of the model which has been used for the description of pandemic progression. The current SIR/SEIR model is based on a model which is descriptive, over-generalized, deterministic, and continuous. Given the availability of vast computing power and data today at disposal, multi-moving agent models address the procedural and spatial aspect of epidemic progression and its relationship with other well-known variables is feasible. For this research project, we expand our previous more general, abstract free moving agent models by incorporating real-world, realistic geodata down to street level using Open Street map (90 billion data points with quality rivals proprietary Google map). Our project so far is able to duplicate the layout for Carlow (50,000 data points) and Cork (350,000 data points) and is working on Dublin (2 million datapoints) for any pandemic not limited to Covid19 as well as anywhere else in the world, contributing to all more informed public/decision-makers alike and establishing a reputation for epidemiology research for Ireland.

09 Anukriti Vashishtha - enviroCORE

Does organic grain enhances the terroir of Irish whiskey

Terroir refers to the combination of all environmental elements that influence a crop's phenotype, such as unique environmental settings, agricultural practices, and the crop's specific growth habitat. These contextual traits are said to give character to distilled spirits and are measurable as flavour compounds. Until now, the term has been confined to the category of only undistilled beverages such as wine and beer but recently there has been some research on the existence of terroir in single-malt Irish whiskey, a finding which may have a far-reaching impact (Kyraleou et al., 2021). The Irish distilling sector is rapidly developing and innovating, boosting the need for local raw materials, which includes exploring grains other than barley for alcohol production, such as wheat, rye, and maize. The primary objective of this research is to explore terroir within Irish cultivated wheat and rye. The study uses the optimised procedures developed by researchers at EnviroCORE. (Morris et al., 2022) to prepare distilled samples of 9 varieties of wheat samples grown across two different locations over two years on the Island of Ireland. The samples are being analysed for flavour and odour differences using GC-MS to find out if terroir exists across different varieties of wheat-based Irish grain whiskey. The findings would help in answering further questions related to the study such as if terroir exists then does it get affected by the type of farming practices employed and are the grain compositional characteristics different between the two crop production types and how it affects the terroir and alcohol yield? The findings would be beneficial for both the Irish distillers and tillage farmers in away that terroir could be used as a marketing tool, highlighting the unique characteristics of the regions where the whiskey is produced.

10 Mutian Wang - enviroCORE

Investigating the Function, Persistence, and Biosafety of Constructed Microbiomes for Improved Bioremediation of Petroleum-impacted Soil

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Keywords: Bioremediation, TPH degradation bacterial consortia, Ecopiling system

Soil is one of the most important non-renewable resources, and the number of contaminated sites in Europe is increasing at an alarming rate. Hence, these sites immediately need to clean up. Bioremediation is a process that can be used to clean up contaminated soil using microorganisms that can metabolize petroleum compounds, reducing their concentration and associated health risks. Thus, a patented process called Ecopiling was developed, involving using a mixture of oil-degrading bacteria to remediate contaminated soil. However, the effectiveness of bioremediation is often questioned, and a better understanding of the survival, function, and persistence of introduced microorganisms is needed. This research aims to select high-effect oil degradation bacteria and build up a high-effect oil degradation bacterial consortia, assessing the biosafety /eco-toxicity and validating the degradation ability in trial plots experiment. Finally, utilize the soil DNA data to examine the correlations of the diversity and abundance of key degradation genes with the microbial microbiome and carry-on transcriptomic analysis of functional biodegradation genes. The study analysed the bacteria, fungi, and nematode microbiome of seven Ecopiles constructed from contaminated soil. The results showed that the phylum Proteobacteria and the genus Rhabditida were associated with samples of the first timepoint, which were more contaminated and could have played a significant role in the degradation of pollutants. In conclusion, bioremediation using microorganisms have the potential to be a cost-effective and environmentally friendly method for cleaning up contaminated soil. However, to achieve its full potential, it is essential to understand the introduced bacteria's survival, function, and persistence in the remediation process. The research conducted by SETU (Carlow) provides a valuable contribution to this field and can be used to develop effective bioremediation strategies for contaminated soil.

11 Aoife Langford - healthCORE

To Assess Movement Competence of Irish Primary School Children Through Fundamental Movement Skills Using Standardised and Novel Measures

Human movement levels and variability have greatly declined since the Industrial Revolutions. The Coronavirus Pandemic has also impacted activity levels of children. Natural environments and movement skills required to navigate them have been replaced by urban civilisation and sedentary lifestyles (Bailey et al., 2012). This has resulted in a decline of children's ability to master fundamental movement skills (FMS) (Behan et al., 2019). FMS are the building blocks for more complex, coordinated movements. Developing FMS can promote habitual movement by equipping children with the necessary skills. Developing a games-based programme focused on enjoyment and play can enhance children's FMS through an inclusive, non-sport specific and variable movements. This study aims to assess current Irish primary school children's fundamental movement skills (FMS)levels using standard universal methods, and a novel obstacle measure. These results will inform the development of an activity programme.

Proposed Methodology

This project aims to assess cross-sectional data of FMS through the Test of Gross Motor Development-3 (TGMD-3) (Ulrich, 2018)to measure locomotor and object control skills. TGMD-3 is a process-based assessment which focuses on the quality of the movement. A Bruininks-Oseretsky Test (BOT-2) (Bruininks &Bruininks, 2005) will assess balance. Both tests have high validity and reliability. A novel obstacle course will be designed to assess FMS in a variable environment. Primary school children (5-12years old) will be recruited in the southeast region.

Expected Outcomes

It is expected that majority of the sample will not meet the mastery levels of FMS in this study (Behan et al., 2019). The study will analyse which FMS achieved the highest prevalence of mastery in both assessments to inform the programme design. It is hypothesised that those who score higher in TGMD-3 and BOT-2, will score higher in the obstacle course assessment. It is anticipated that older participants will have higher levels of mastery.

12 Patti Roche - Department of Land Science

Pot Trial - How can soil structure influence phosphorus dynamics?

Soil pore structure influences root penetration and hydrologic processes, and hence, exerts influence on nutrient dynamics. The influence of structure on the availability and release of legacy soil phosphorus (P) stores is not fully understood. Consequently, there are limited options available to improve mining of P reserves, and current recommendations are based predominantly on soil chemistry. The hypothesis of the present research is that poor soil structure impedes change in P index and mobilisation of Preserves. While poorly structured soils may be more difficult to change chemically, structural improvements could allow a more effective manipulation of indices. The influence of soil structure on mobilisation and availability of phosphorus is being examined through a pot trial. The aim is to study the influence of contrasting soil structures on build-up and draw down of soil P, across low to high P indices. Soil of varying soil test Morgan's P values was collected, air dried, and sieved. Each soil was packed into pots at three different bulk densities, to reflect good, average, or poor soil structures. Perennial ryegrass was sown and rooting was allowed to establish over a 6 month period to encourage structural development. After the priming period (2022), baseline measurements of soil test P (Morgan's) were taken in Spring2023. Treatments of draw-down and build up rates of P will be applied over two years. Soil P is measured annually to detect trends in P build-up or drawdown. Herbage measurements will be taken at intervals typical to grazing rotations of 21 to 28 days throughout the growing season, to allow P balance to be calculated. Soil physical quality will be assessed at the conclusion of the trial in 2025.

13 MD Shamsuzzaman - engCORE

InSAR Data as a Peatland Monitoring Tool: Insights into Hydrological Processes and Ecosystem Restoration in degraded raised bogs of the Republic of Ireland

Peatland surface motion can provide valuable information about the condition of peatlands, but traditional field-based methods for measuring this motion are not cost-effective over large areas and long periods. Interferometric synthetic aperture radar (InSAR) is a promising alternative that can quantify peatland surface motion over large areas. This method has been tested by comparing the characteristics of InSAR time series obtained from the European Ground Motion Service (EGMS) over a 48-month period at thre epeatland sites in the Republic of Ireland to site condition assessments based on restoration activities. The InSAR data collected from three degraded raised bogs in the Republic of Ireland, from 2016 to 2020, reveals important insights into the effect of restoration on peat surface uplift and water table levels. The data, which was collected at a six-day interval, provides a detailed understanding of the hydrological processes in these areas. The restoration of the bogs in 2018 resulted in an increase in the water table levels, which was captured by the water table data collected before and after the restoration. This increase in the water table levels was accompanied by an uplift in the peat surface, which was detected through the InSAR data. The rainfall data collected from the bogs areas provides additional context to the changes in water table levels and peat surface uplift. The correlation between the rainfall data and the InSAR data suggests that changes in the water table levels, and peat surface uplift were driven, in part, by precipitation events. Overall, the InSAR and water table data provide critical insights into the success of the bog restoration efforts. The increase in the water table levels and peat surface uplift indicate that the restoration efforts were effective in reversing the degradation of these important ecosystems. This information can be used to inform future restoration efforts and ensure the long-term sustainability of these valuable ecosystems.

14 Samanyu Raina - engCORE

Feasibility studies of Radial nozzle for Internal Diameter Coatings in Pipes using Cold Spray Process

Cold gas dynamic spray (cold spray) has emerged to be the most attractive non-thermal metal deposition process that has garnered significant interest from researchers and industry due to its potential in the coating, repair and additive manufacturing. During the cold spray process, particles are accelerated at high pressure with a preheated supersonic gas stream above the critical velocity, but below the erosion velocity, to achieve the bonding. The three main parameters affecting the performance are input power (gas stagnation pressure and temperature at nozzle upstream), powder & substrate material properties and the nozzle design. Production of various (corrosion resistant, heat conducting, refractory, etc.) coatings on the internal surfaces of cylindrical articles (pipes, etc.) is also an important problem in energy, oil & natural gas, automotive and food industry. With the use of coldspray, protective coatings can be produced on the inner surface utilizing two possible approaches of deposition. One approach implies using a single nozzle with pipe rotation, and the other approach using an annular nozzle without pipe rotation. Previous study by Klinkov et al. [1,2] studies the coating on internal diameter pipes of diameter less than 100 mm. It was seen that the deposition efficiency decreased rapidly once the difference between pipe and nozzle radial diameter increased. Our initial study in direction of radial nozzles focusses on improving nozzle performance with strategic design changes, to turn particles radially without sustaining significant losses, thereby further improving deposition efficiency. Furthermore, the process's mass and energy consumption parameters, as well as the deposition efficiencies possible under standard experimental settings, have been computed. These estimates enabled us to assess the cost of introducing the cold spray method into pipe production.

Reference:

S. V. Klinkov, V. F. Kosarev & V. N. Zaikovskii (2016)Preliminary study of cold spraying using radial supersonic nozzle,Surface Engineering, 32:9, 701-706, DOI:10.1179/1743294415Y.00000000702.

S.P. Kiselev, V.P. Kiselev, S.V. Klinkov, V.F. Kosarev, V.N.Zaikovskii, Study of the gas-particle radial supersonic jet in the cold spraying, Surface and Coatings Technology, Volume313,2017, Pages 24-30, ISSN 0257-8972

15 Sarah Kernaghan - Pharmaceutical and Molecular Biotechnology Research Centre

Green Synthesis of Pharmaceutically Relevant B-Hydroxy Ketones using Biocatalysis in Batch and Flow

In light of the current climate crisis, pharmaceutical producers must consider how the physical and chemical properties of their products and processes impact living creatures and the larger environment. An 'inherently safer design' approach must be apriority in the concept design and production phases to minimize adverse health and environmental consequences, and simultaneously reduce the potential for production disruption due to emerging legislative chemical restrictions. The sustainability of a process must be considered as beneficial greener traits become redundant if the efficiency, efficacy, and economic viability of the product are not maintained or improved. This research has evaluated and optimised an eco-friendlier and sustainable synthetic method for beta-hydroxy ketones which are incorporated into the manufacturing of many anti-cancer, anti-viral and antibiotic medications. The traditional method for obtaining these building blocks is through strong bases or heavy metal catalysis; often requiring high temperatures and producing unwanted by-products. Our optimised method aligns with several of the 'Principles of Green Chemistry' by taking an ambient biocatalytic approach by using lipases to catalyse a promiscuous decarboxylative aldol reaction. The FDA previously predicted the transfer of pharmaceutical production from batch to continuous manufacturing due to the increased efficiency, flexibility, and cleaner process methods. Initial proof of concept experiments translated the enzymatic decarboxylative aldol reaction to flow conditions through an in-house fabricated reactor system, which has not previously been reported in the literature. The optimized batch conditions allow the reaction to reach completion within 2hours, previously only reported on a 24 to 72 hours duration. Our initial flow results proved promising with results of up to 98%conversion in 1 hour. This greener methodology demonstrates that a 'benign-by-design' approach and process optimisation can produce sustainable energy-saving synthetic methods that can aid in the pharmaceutical industry's action towards meeting several of The Sustainable Development Goals.

16 Julie Crowley - School of Health Sciences

A Study of Irish Nurses and Caregivers During the Great War

The Great War had a long-lasting impact on military nurses, doctors, caregivers, and the veterans whom they treated. The purpose of this study is to examine the role of Irish nurses and caregivers who were involved in casualty care during the war. The study takes a qualitative approach to primary and secondary sources related to Voluntary Aid Detachments, Queen Alexandra's Royal Army Nursing Corps, and war hospitals in Ireland. Archives from the Royal College of Physicians of Ireland, the Bureau of Military History, and the Royal Dublin Fusiliers Association have been subjected to document analysis. Case studies of Voluntary Aid Detachment members who served in Ireland, Britain, and France will be discussed. Irish medics enlisted with the Army Medical Service, encouraged by the Irish Medical War Committee. The British Red Cross Society and St John's Ambulance Association formed the Joint War Organisation, which oversaw the recruitment and training of Voluntary Aid Detachments. First-hand accounts provide insight into their experiences on the Western Front. The development of artillery and weaponry led to unprecedented casualties. Ireland's military hospitals expanded to accommodate the influx of injured and mentally ill veterans. Voluntary Aid Detachment members augmented the professional work of military nurses. Doctors pioneered surgical techniques to repair the facial damage caused by bullets, shells, and artillery. Shellshock was poorly understood during the war, and experimental medical treatments took place in Irish hospitals. Irish caregivers played an important role during and after the Great War on the Western Front and in military hospitals. Their experiences can be uncovered through the analysis of archival documents.

17 Katie Healy - enviroCORE

Enhancing the sustainability of mineral use on Irish cattle and sheep farms

A significant portion of research into mineral nutrition of ruminants has been carried out in the United Kingdom, United States, and New Zealand. However, the production systems in these countries often differ to Irish production systems in terms of the role of forage and supplements in the diet as well as the soil type. Although research has been conducted in Ireland into ruminant nutrition, mineral nutrition has not been the primary focus. Thus, there is a knowledge gap in mineral feeding practices on Irish farms but especially cattle farms and those operating organic enterprises. The latter is a particularly important subset of farmers as Ireland aims to increase the number of organic livestock farms, in line with the European Union 'Farm to Fork' strategy. It is not apparent that a survey of mineral feeding practices in an organic herd/flock has ever been completed. This research will utilise a questionnaire in order to collect data on the current mineral feeding practices of Irish cattle and sheep farms, in particular the organic systems. From this, farms will be selected, and further data will be generated surrounding the mineral content of the animal's feed such as silage, which will be taken from the farm, and tissue which will be taken from the animal at the time of slaughter. The mineral content of the feed and tissue samples will be determined using Inductively Coupled Plasma Mass Spectrometry. The aim of the project is to gather more information surrounding the mineral nutrition of ruminants in Ireland and highlight the correct mineral management strategies that are needed to support the growth and sustainability of animal systems, especially in organic systems.

18 Jack Sweeney - healthCORE

Suicide Prevention in the Construction Sector

This poster presentation will outline the planned development of suicide prevention awareness training in the construction sector using multiple behavioural theories and the co-design approach. The training is intended to address the high rates of suicide in the industry and promote a culture of safety, support, and mental health in the work place. The underlying structure for the training will be informed by theories of Help-Seeking, the Theory of Planned Behaviour, -B model, and the Behaviour Change Wheel. These theories will provide a framework for understanding the factors that influence suicide prevention behaviour in the workplace. The training resources will be developed using design thinking and co-design principles, which will involve working collaboratively with stakeholders from the construction industry to develop training that is tailored to the unique needs and challenges of the sector. The planned benefits of using multiple theories and a co-design approach to develop suicide prevention awareness training in the construction sector include increased engagement and buy-in from stakeholders, practical strategies for promoting suicide prevention behaviour in the workplace, and training that is tailored to the unique needs and challenges of the sector. The importance of ongoing evaluation and refinement of the training, including the use of feedback from stakeholders and measures of training effectiveness, will also be discussed. In conclusion, the planned development of suicide prevention awareness training in the construction sector using multiple theories and a co-design approach is a promising approach for promoting a culture of safety, support, and mental health in the workplace. By engaging stakeholders in the development process and tailoring the training to the unique needs and challenges of the sector, employers can help to reduce the risk of suicide and promote a culture of support for those in need.

19 Shannon Hughes - Social Care and Early Childhood Studies

Spence Pre-drinking as a liminoid ritual - Women's experiences in the Night Time Economy

The Night Time Economy (NTE) is a place of hedonism and fun, where daytime norms are subverted and identities are amplified, however illusionary and temporary (Smith, 2014). Previous research has focused primarily on women's experiences within physical NTE venues such as pubs, bars and nightclubs (Fileborn,2012). However, I argue that considering women's experiences before entering NTE venues, within the venues, and leaving the venues, shines a light on the systems of power and gendered social control that is in operation within such spaces. Within this presentation, through a space and time analysis, I examine women's experiences of the beginning of a night out, in the home where a pre-drinking ritual occurs. Here, women begin to enter a state of liminality, or the liminoid, and begin to accept and resist the systems of power and gendered social control that influences their behaviour in the NTE (Gill, 2008).

20 Maeve Mannion - healthCORE

The effects of the menstrual cycle on objective performance in females participating in weight categorised sports

Introduction

The Menstrual Cycle (MC) is a biological rhythm mostly driven by the fluctuation of the endogenous sex hormones oestrogen and progesterone (McNulty et al.,2019). Conflicting evidence exists on the impact of the MC phase on performance. Female athletes taking part in WC sports have a greater likelihood of MC irregularities due to excessive weight fluctuations, which will be considered in recruitment. The aim of the proposed research is to investigate the effects of the MC on performance in female athletes taking part in weight categorised (WC) sports.

Methods

The observational study design participants will be eumenorrheic, with a MC length of 21-35 days, at least 9 periods per year and free from hormonal contraceptives 3 months prior to recruitment.MC will be tracked for at least 3 months prior to study commencement. MC phase 1 is the onset of bleeding. Phase 2will be determined by ovulation kits, with a surge in luteinizing hormone (LH) greater than 40mIU/mg of creatinine, 14-26 hours prior to ovulation. Phase 3 will be indicated by a positive urinary ovulation test. Phase 4 occurs at least 7 days post ovulation. Blood samples, measuring oestrogen and progesterone, will be used for phase accuracy in addition to ovulation kits. Objective performance measures will be measured during the four phases. Performance measures will be discipline dependant. Force measurements will be taken for all athletes. Aerobic measures will be taken for athletes participating in aerobic based WC sports.

Expected Outcomes

Force and aerobic measures may vary during MC phases, particularly during phase 1. The greatest difference in force anaerobic measures may occur during phase 2 and phase 4. The menstrual is a highly individual process.

Discussion/ Conclusion

Female athletes would benefit from applying more sex-specific research to their training protocols and competition.

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21 Raph Britton - Department of Sport and Exercise Science

Amateur Boxing Coaches Perceptions of Straight Punch Technique and Strength and Conditioning Practices

Introduction: Victorious professional boxers previously exhibited higher cumulative punch force than losers (Pierce et al., 2006), and victorious amateur boxers exhibited better punch accuracy, more defensive combinations, and more punching combinations than losers (Davis et al., 2013). These attributes require high levels of skill, strength, endurance and overall fitness to facilitate their energetic demands. Boxing is Ireland's most successful Olympic sport with eighteen of thirty-five medals coming from amateur boxing. Currently no research on the perceptions of amateur Irish boxing coaches exists regarding punching technique or strength and conditioning. Such information could help to guide coaches on technical training and strength and conditioning practices. The aim of this research is to garner information on the perceptions of amateur Irish boxing coaches on straight punch technique and strength and conditioning practices.

Methods: Semi structured interviews will be conducted with Irish boxing coaches. Interviews will consist of two phases 1) punch technique and 2) strength and conditioning practices (what, how and why?). Braun and Clarke six step thematic analysis will be used to analyse the interviews and derive themes. Coaches will be provided with video of straight punches and asked to analyse the movements. Coaches will then be asked about their perceptions of various strength and conditioning practices in relation to boxing performance.

Expected Outcomes: Lindsay & Lenetsky (2020) conducted interviews on punch technique eliciting four main components of a straight punch, 1) whole body movement, 2) footwork, 3) hip and shoulder rotation and 4) hand and arm position. It is hypothesised that results will indicate approximately four areas of the body relevant to punch technique. Coaches may have varied perceptions of different components of strength and conditioning, and some may have a propensity for sport specific boxing training over gym based strength and conditioning.

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22 Andrea Buckley - Department of Nursing and Healthcare

Gender-sensitive Lifestyle Psychiatry for Individuals with Severe Mental Illness - A scoping review with a focus on gender-specific studies. Preliminary results.

Introduction: People with severe mental illness (SMI) present with high rates of physical comorbidities, reducing their lifespan by 10-20 years compared to the general population (Firth et al. 2020). Lifestyle psychiatry (LP) as an evolving field, addresses modifiable risk factors, with interventions related to physical activity, diet, sleep, smoking cessation, which are traditional pillars of health (Noordsy,2019). Health outcomes are influenced by two separate but intersecting concepts, sex/gender, with sex defined as a biological, and gender as a social construct (Dahlgren &Whitehead, 2021, Heidari et al., 2016). Gender is incorporated into the United Nations (UN) 2030 Agenda for Sustainable Development Goals (SDG`s) (2020) to abate health inequities. Despite sex/gender being concordantly considered important (The Lancet, 2016), their use in research and practice appears patchy, conflated (Greaves & Ritz, 2022), gender-neutral, and therefore imprecise (Howard et al. 2017, Chandra et al. 2019). Objective: This scoping review will explore if and how sex/gender are considered in LP for SMI with a focus on gender-specific studies.

Methods: The intended scoping review will follow the Joanna Briggs Institute`s (JBI) Preferred Reporting Items for Scoping Reviews (PRISMA-ScR) guidance, building on Arksey and O`Malley`s framework (Peters et al. 2021). Databases CINAHL, Scopus and PubMed will be searched, retrieved articles uploaded to the RAYYAN application(www.rayyan.ai), screened by two authors and discrepancies about in/exclusion clarified by consulting a third author. Search terms relating to "SMI", "LP" and "sex/gender" will be included, for adults over 18 years, in peer-reviewed literature, in English, from2012 to 2022, and all study types except protocols. Data extraction will be pursued with an author developed form, findings mapped and reported in a narrative synthesis.

Conclusion: The results from the scoping review will serve as a knowledge base within the iterative research project of the PhD project. The current status of gender-sensitive mental health services for women—findings from a global survey of experts.

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23 Abinash Nayak - Department of Science

Development of enzymatic methods for the synthesis of carbohydrate fatty acid esters (CFAEs) employing quantitative NMR (qNMR) as an analytical tool

Antimicrobial and antibiotic compounds are vital to human health in both food and pharmaceutical applications. One major issue with the over-application of these compounds is the development of antibiotic resistance and there exists a need for effective alternatives. Carbohydrate Fatty Acid Esters CFAE's offer great potential for application as biodegradable, non-toxic anti-microbials. The current chemical methods of preparation of CFAE's are difficult, with long reaction processes generating considerable waste. There is a need to develop greener reaction methods and processes to meet UN Sustainable Development Goals and urgent National Climate Policy. Here in, we have developed an enzymatic synthesis of CFAEs optimising parameters such as sugar substrate solubility, reaction time, temperature, reagents molar ratio, catalyst load. In this context, a quantitative Nuclear magnetic resonance(qNMR) spectroscopic method has been developed which not only offers quantitative analysis but also provides complete picture of reaction mass balance. This method has been verified in terms of accuracy by column chromatographic purification of product and experimental duration by optimising two predominant factors that are number of scans and longitudinal relaxation time(T1) in order to achieve quantitativeness. To make the CFAE synthesis more sustainable and green some preliminary green solvents has been evaluated demonstrating the green alternatives of conventional hazardous solvents. Hence, we are proposing a green synthetic method of CFAEs which is efficient, comparatively less time consuming, ease of reaction monitoring, with green solvents and novel CFAEs which comprises sugars derived from waste streams such as Xylose, Rhamnose and unsaturated fatty acids. Currently, substrate scope exploration is in progress and in future their potential applications will be evaluated in emulsifying and antimicrobials activity along with novel recombinant enzyme preparation and their application in CFAEs synthesis and exploration of flow chemistry.

24 Niamh Bradley O'Connor - healthCORE

The Effect of Standardised versus Unstandardised Procedures on Surface Anthropometric Assessment in Female Athletes.

Introduction

It is currently recommended for body composition to be assessed under standardised conditions (Stewart et al., 2011). Conducting body composition assessment under standardised conditions may present logistical issues for athletes with strict training regimes. Trivial changes in surface anthropometric outcomes between standardised and unstandardised conditions have been recorded in males (Kerr, Slater and Byrne, 2017). Due to known physiological differences between the sexes, specifically endocrinology, previous findings may not be transferrable to females. The aim of the study was to identify the effect of standardised versus unstandardised conditions on surface anthropometric assessment in female athletes.

Methods

Forty female athletes participated (aged 16-40 years, trained ≥3times weekly, screened to be not at risk of Low Energy Availability, not pregnant). Surface anthropometric measurements were taken on two separate occasions on the same day under 1.) Standardised Conditions – on wake, bowel and bladder void, fasted, rested and hydrated and 2.) Unstandardised Conditions –later the same evening, ad libitum food, fluid and physical activity. Measurements included body mass, stature, eight skinfold sites, six circumference sites and urine osmolality.

Results

Significant differences between conditions were noted for bodymass ($p=0.003$, $d=0.02$), urine osmolality ($p=0.04$, $d=0.33$) and waist circumference ($p=<0.001$, $d=0.13$). No significant differences were observed for skinfolds, or all other circumferences ($p>0.05$).

Conclusion

Surface anthropometric assessment may be conducted at anytime of the day. Trivial changes can present under unstandardised conditions for measures of body mass and waist circumference. Itis recommended to repeat measures at the same time of day if retesting.

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25 Sarah Foley - Department of Science

Recombinant human ASPA expression in E. coli and P. pastoris and activity assay development

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Aspartoacylase (ASPA) (E.C 3.5.1.15) is an enzyme responsible for the catalysis of the deacetylation of N-acetyl-aspartate (NAA)–providing free acetate for the synthesis of the myelin sheath and white matter throughout the human brain. The ASPA geneen codes ASPA enzyme - mutation(s) in this gene result in a deficiency of the ASPA enzyme, causing a rare genetic neurodegenerative disease called Canavan Disease (CD). CD patients typically present within the first months of life with macrocephaly, missed developmental milestones, intellectual disability, spasticity, and seizures. With no current therapy available, the majority of patients succumb to the disease during childhood. Gene therapy is the most promising treatment with recombinant adeno-associated viral vectors (rAAV) being at the forefront of currently used delivery vehicles in preclinical and clinical applications.

This research has examined the cloning, expression, and purification of recombinant human ASPA enzyme in prokaryotic and eukaryotic hosts, E. coli and P. pastoris, with activity determined using ion chromatography with conductivity detection. ASPA enzyme activity has been studied with varying time and enzyme concentration via the reduction of substrate (NAA) and an increase in product (acetate) in a single method - the resulting activity from both hosts is not as expected, with the E. coli expressed ASPA outperforming the P. pastoris enzyme. This research project will use this chromatographic method in tandem with a high throughput spectrophotometer screening assay, to quantify ASPA activity in mutant clones generated using directed evolution. This technique introduces randomized mutations to the gene mimicking evolution; mutants are screened for enhanced enzyme activity due to the translated amino acid changes. The research outputs of this work are directed towards identifying a super-ASPA for potentially enhanced gene therapy options for future trials.

26 Adam Power - Department of Sports and Exercise Sciences

Pilot study of an extended exercise intervention on senescent T cells in older adults

Intro: The immune system's T-cell composition varies as humans age, producing more "older," potentially malfunctioning, and inflammatory T-cells as opposed to "younger" T cells. Immuno senescence is the word used to describe these changes, which are connected to a number of aging-related conditions include frailty, vascular disease, and reduced immunological function. The role of regular exercise and fitness in altering the T-cell subsets of ageing individuals is not well understood and recent high-quality reviews have identified gaps in the evidence base. In particular, there are very few exercise intervention studies with a specific focus on senescent cells. It is possible that a particularly long intervention might be needed to change T-cells profiles.

Methods: A 12-month pilot study is proposed to examine changes in T-cell profiles and inflammatory markers in older adults > 65years with elevated levels of “older” T-cells. Pilot studies have particular value prior to a major set of trials when researching new fields. The research design will include higher intensity work for some participants and will recruit older women and men. A smaller study comparing continuous exercise with bursts of higher intensity exercise will also be undertaken in this group.

Expected Outcomes: There is evidence in acute studies that exercise may promote apoptosis (Cell death) in senescent cells which are typically more resistant to apoptosis, thus “making space” for replacement with ‘’Young’’ cells. The “making space” hypothesis (Simpson, 2011) has been a feature of the literature, though still regarded as a hypothesis. Exercise stimuli may also influence immune function differently depending on exercise intensity since evidence suggests that HIT (High Intensity training) increases apoptosis in "older" T-cells possibly lowering the burden of Immuno senescence related diseases; whereas MIT (Moderate intensity training) targets "younger" T-cells modulating the ability to deal with acute pathogens.

27 Bahram Choupanzadeh - Department of Engineering Technology

Investigating the Impact of DTL Dose in Displacement Talbot Lithography on Photoresist Removal

Experimental work in the field of lithography was conducted. Lithography is a crucial process for fabricating micro- and nano-scale devices and structures with a wide range of applications in various fields such as electronics, biotechnology, medicine, and materials science. The process involves transferring a pattern from a mask onto a substrate material using a series of steps, including photoresist coating, exposure, and development. In this study, displacement Talbot lithography is employed. Displacement Talbot lithography is an interferometric lithography technique that utilizes the self-imaging property of the Talbot effect to create high-resolution periodic structure. It involves exposing a photoresist-coated substrate to a periodic interference pattern generated by a coherent light source, with the substrate being displaced before each exposure to create a replicated Talbot interference pattern. A variety of DTL exposures dose were used, starting with 75 mJ/ cm2 and increasing in steps of 5 mJ/cm2 up to 100 mJ/ cm2. The power of the exposure device was 1mJ/ cm2, with the exposure time varied from 75 to 100 seconds, with steps of 5 seconds. The experiments were carried out on a single wafer, with each step represented as a distinct line on the wafer. Atomic Force Microscopy (AFM) was utilized for the analysis. The conclusion of this experiment has two parts. First, the height of all steps being equal indicates that the photoresist in the exposed area was removed vertically in all steps. Consequently, the entire photoresist was removed in a vertical direction using the smallest exposure time in the exposed area. Second, increasing the exposure dose or exposure time resulted in wider width of the photoresist-removed lines, indicating that a longer exposure time leads to more photoresist being removed in the horizontal direction in the exposed area.

28 Syeda Atitqa Tajammal - Department of Science and Computing

Extraction of Active Substances from Green Tea and their Incorporation in Phytosomes to Improve Stability, Bioavailability, and Permeability

It is well known that green tea extract (GTE) have a wide range of bioactive activities, including potent antioxidant, anti-inflammatory, antibacterial, and wound-healing processes that are accelerated by angiogenesis and an anti-fibrotic action. In vivo wound healing and scarring were found to be considerably improved by the polyphenols in green tea (such epigallocathecin gallate). While several research have demonstrated these qualities both in vitro and in vivo, very few have included the extract in formulation fora wound dressing. Despite having beneficial effects on wound healing, there are presently no green tea wound dressings on the market because some of the main bioactive components, like epigallocathecin gallate, are not suitable for direct application due to their low stability, bioavailability, and permeability to the skin. Also, the creation of wound dressings is a difficult process that calls for different dressings for various kinds of wounds. Our aim is to incorporate GTE in nao systems to protect them from degradation caused by environmental factors i.e., air, light and pH. The first step was the extraction of bioactive ingredients having potential for wound healing form green tea. Heat Reflux Extraction was the chosen method and by using 80% IMS at 75oC for 120 minutes, highest percentage yield of 186.79 ± 15.19and 156.18 ± 9.66 was achieved for EGC and EGCG (primary components of interest) respectively. Incorporation of GTE inphytosomes was achieved using thin film hydration technique. Phophatidylcholine was chosen due to its potential to interact with polyphenols to encapsulate GTE. FTIR and SEM analysis showed effective incorporation of GTE in phytosomes. Further analysis of phytosomes including encapsulation efficiency and antimicrobial potential is required to assess their efficacy for wound healing.

29 Jade Stanley - enviroCORE

Environmental assessment of Starch-protein blend bioplastics with the use of sustainable starches

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The use of commodity plastics has increased significantly over the last few years worldwide. They are inexpensive and have multiple applications. However, single-use plastics are produced with non-renewable materials and are usually not recyclable. They end up in landfills or are disposed into the environment, which is detrimental to animal and human health. Recently, an effort has been made to generate different bioplastics, such as starch-protein blend thermo bioplastics to combat this environmental challenge. Current SPBBs use non-sustainable starches, such as potato which compete with food production and are a poor starch alternative to the currently used plastics. This study aims to assess how the SPBBs generated with different, sustainable, starches impact the environment. The environmental assessment covers both land and water degradation, with marine algae toxicity being used to gather data on how the SPBB's impact on marine environments. The degradation of the bioplastics has been assessed using Oxitop chambers and visual degradation. The toxicity of sustainable bioplastics was conducted using the phytotoxicity of monocot and dicot plants. Worm toxicity and preference were used to determine the ecotoxicity of adult worms and the effect they have on juveniles, while also conducting a preference test to view if the worms liked a soil with a particular bioplastic. Results showed that all bioplastics are degradable and cause algae populations to increase at varying concentrations. The phytotoxicity revealed that bioplastics negatively affected the root and shoot growth of the monocot and dicot plants. In terms of worm ecotoxicity, the number of adult worms and juveniles showed no significant difference from the bioplastics and control. The soil preference using the worms showed that Sago and Tapioca bioplastics were favoured by the worms the most. Inconclusion, the environmental assessment performed indicates that the starches investigated can be used to create bioplastics that can aid in tackling the environmental challenge of plastic pollution. Further studies are needed to identify the potential applications of these results by conducting activities like focus groups.

Keywords: Thermo Bioplastic, Starch, Environmental Challenges, Ecotoxicity, Degradable

30 Sarah Fagan - Sport and Exercise Science

Exploring the perceptions of and preferences towards exercise and nutrition supplements among older adults with frailty

Background

Frailty is common among older adults and characterized by reduced ability to withstand external stressors and vulnerability to negative health outcomes. Combined exercise and dietary interventions have been shown to reverse frailty, however there is a need to develop interventions that are more accessible to patients. Involving end-users in intervention development increases the likelihood that the intervention is acceptable to the intended population, enhancing potential for success.

Aim: To understand attitudes of older adults with frailty towards exercise and protein supplementation.

Methodology

Older adults (≥65 years) referred to a Geriatric Medicine Clinic at University Hospital Waterford were recruited at routine clinic assessment. Recruitment is still on-going. Semi-structured interviews were conducted via telephone or face-to-face. A topic guide created based on the COM-B behaviour change model explored participants' capabilities, opportunities and motivations with regard to exercise and protein supplementation. Preferences for the delivery model were also explored. Interviews were audio recorded, transcribed and analyzed using thematic analysis.

Results

Five participants (female 60%, mean age 82.5 years, mean clinical frailty score 5) have been recruited. Emerging themes include i) physical limitations impairing exercise capabilities, ii) lack of understanding/education limiting opportunities and motivation for fortified foods, such as protein supplements iii) ageing with independence and social interaction as motivators for engagement and iv) influence of medical professional on compliance. There was a preference for 'known sources' of protein such as protein milk over powdered products. Discussion Nuanced factors relating to their age and condition influence frail older adult attitudes to exercise and protein supplementation.

Conclusion

Incorporating the opinions and preferences of older adults with frailty within intervention development, tailors to the needs of this population paving the way for more promising intervention compliance.

31 Brian Mulhare - School of Health Science

Exploring Older Adults' Perceptions of the Barriers, Facilitators, and Motivators to Resistance Training: A Qualitative Study using the COM-B Model and TDF

Introduction: The increased lifespan has not been accompanied by an equivalent period of good health, free from chronic diseases and age-related disabilities (Crimmins, 2015). Structured resistance exercise has been proven to significantly benefit physical, physiological, and cognitive domains, prolong independence, and improve quality of life (Fragala et al., 2019). This study examines older adults' perceptions of the barriers and enablers of resistance training (RT).

Methodology: Qualitative data was collected through focus groups using the framework of the Behaviour Change Wheel. The participants, who were recruited from various groups such as Local Sports Partnership, active retirement and church groups, were randomly assigned to the focus groups. The questioning was guided by the COM-B model, aiming to investigate older adults' capabilities, opportunities, and motivations concerning RT. The focus groups were recorded and subjected to directed qualitative content analysis, which involved mapping them onto the Theoretical Domains Framework (TDF).

Results: A total of 27 older adults participated in 6 focus groups (Female 67.67%). The study mapped the factors that affect RT behaviour to 13 TDF domains, which allowed for the identification of various barriers, facilitators, and motivators. The domain of "social influence" and particularly the construct of "social norms" was important in understanding RT behaviour in older adults. Social norms grew to impact the domains of "knowledge", "skills", and "beliefs about capabilities".

Discussion: It was apparent that social norms formed in youth played a significant role in how this population perceived RT. The absence of education and opportunity diminished the perception of competence, which is amplified by current RT environments.

Conclusion: With the population continuously ageing, appropriate preventive action is warranted. These findings can assist in these efforts by enhancing our comprehension of the behaviour in question and thus contributing to preventive measures.

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32 Jennifer Drohan - Department of Science

Development of a living base station for molecular communication

Taking inspiration from the communication mechanisms observed throughout nature, molecular communication involves information transfer using molecular signals in an aqueous medium. This differs from conventional communication methods such as wireless communication where the information is carried through free space by electromagnetic waves in radio-frequency. Molecular communication (MC) incorporates the fundamentals of communication theory, information theory and biochemistry amongst a whole cohort of other areas. The field of biological-based molecular communication focuses specifically on molecular signals produced from living organisms such as bacteria.

This work, funded by VistaMilk SFI Research Centre, involves modifying bacterial populations through molecular biology techniques such as genetic engineering and synthetic biology to replicate or simulate, in wet lab experiments, theoretical molecular communication models. Numerous E. coli bacterial populations have been genetically modified to produce a variety of fluorescent proteins including red, blue, teal, cyan, and green. Each of these bacterial populations expressing fluorescent proteins can represent information molecules or molecular signals. Alternatively, they may be used to signal population interaction events in a larger system. Synthetic biology allows each of these bacterial populations to be custom designed thereby expanding experimental design possibilities. Each of the E. coli populations allow for chemically controlled release of signals and governable signal output concentrations. The programmable nature of these E. coli populations can be adapted to different molecular communication systems. Information molecules can be detected and quantified using techniques such as fluorescent imaging, luminometer readings, SDS-PAGE and flow cytometry. Molecular communication pushes the boundaries of conventional communication methods and is seen as the enabling technology for facilitating future biomedical, environmental, and ICT applications such as targeted drug delivery, biosensor and actuator networks, and environmental monitoring

33 Ali Taha Ozdemir - Pharmaceutical & Molecular Biotechnology Research Centre

The engineering of drug loaded nanospheres as a first line of defence against COVID-19

Since the beginning of the pandemic, the COVID-19 has claimed millions of lives and continues to threaten many. Economically, it is currently driving many countries into a recession and millions of people have become unemployed. SARS-CoV-2 is the virus that causes COVID-19, and it is primarily transmitted when people breathe in air contaminated by respiratory droplets and small airborne particles. Corona viruses consists of crown-like protrusions on its surface called 'Corona', meaning crown in Latin. These extensions are spike proteins and play an important role during the infection. SARS-CoV-2 uses these structures to attach itself to the host cell, in turn leading to entry into the host human cell leading to COVID-19 Disease. My PhD project aims to develop engineered nanodecoys in the form of 'nanospheres'. When delivered to the respiratory system, nanodecoys will release a molecule called an enzyme inhibitor, while binding to and neutralizing coronavirus, in a way that will preventing its attachment to cells in our respiratory system. When loaded with potential antiviral drugs (TMPRSS2), nanodecoys can also deliver therapeutics directly to the lungs. With the aid of nanodecoy therapy, the immune system will have a better chance to clear the virus and repair the damaged tissue. Creating this window of opportunity is especially important because old people with reduced immune capacity and healthcare professionals in contact with the virus for longer periods of time are at higher risk for serious infection. As such, giving the immune system this b extra assistance could reduce the severity of the infection and potentially reduce fatalities

34 Shane Ryan - healthCORE

Intra- and inter-day reliability of inertial loads with cluster sets when performed during a quarter squat on a flywheel device.

Introduction: Flywheel iso-inertial training (FIT) has become increasingly popular as a training modality. To date, only one study has examined the reliability of the flywheel quarter-squat (Sabido et al., 2018). The aims of this study were to i) estimate the intra- and inter-day reliability of different inertial loads on various kinetic and kinematic measures during a flywheel quartersquat using a cluster set approach; and ii) to determine the acute effect of internal and external attentional focus on performance measures when performing the flywheel quarter squat.

Methods: Twelve collegiate field sport athletes attended four cluster-set testing sessions separated by 7 days. Sessions consisted of 4 sets of 15 repetitions of a quarter-squat flywheel exercise with varying moments of inertia (0.025, 0.050, 0.075 and 0.100 kg.m2), in an ascending or descending order. A cluster block consisted of 5 repetitions, including “momentum repetitions” (3 x 5+5+5). Mean power (MP), concentric (CON) power, eccentric (ECC) power, and ECC overload were recorded for both internal and external attentional focus groups.

Results: Mean power output showed lighter inertial loads (0.025 kg·m2) produced greater CON force. Alternatively, heavier inertial loads (0.050, 0.075 and 0.100 kg·m2) produce greater ECC force and subsequently, greater ECC overload. The external instructional group attained familiarisation (outcome stability) after two flywheel sessions (ES = 0.03 – 0.15) with little volatility between performance measures (CV% = 3. 39 – 9. 22). In contrast, the internal group had a significant difference between day-2 and day-3 using the 0.075 kg·m2 load (p = 0.017). Additionally, the internal group saw large differences in mean power output between all inertial loads from day-2 to day-3 (ES = 0.59 – 1.25).

Conclusion: Both instructional groups reported positive performance measures, albeit the external group reached stability at an earlier stage. The flywheel cluster-set is a valid and reliable training modality for maintaining MP output during all repetitions

35 Alistair Chambers - engCORE

Methods of determining erosion rates of Wind Turbine blade coatings

One of the main challenges facing offshore wind power production is erosion of the leading edges of the blades. This damage leads to reduced aerodynamic capability of the blade and by association then reduces the ability of the whole turbine to produce electricity as efficiently and cost effectively as it should. Rain erosion along the leading edge of the blades reduces a wind turbine's annual energy production by between 5% and 25%. The research being undertaken is looking at the different coatings, currently in-service or being developed, for use on the leading edge of these blades. The aim of the research is to test and compare the different coating systems experimentally and numerically by simulation. The experimental element of the test program will be undertaken using the Droplet impact erosion mill (DIEM) which is being developed in SETU with funding from SEAI. This apparatus will allow for accelerated rain erosion tests to be undertaken on a selection of samples. This apparatus uses a set velocity and size of water slug to simulate the impacts of high velocity rain drops that occur in nature but at an accelerated rate. This allows for identification of the incubation period and analysis of the failure modes of the coatings being tested. Modelling of the differing layering system of the coatings available will be undertaken, and these coatings will be analysed in Ansys/Abacus simulations to assess the forces involved in the impact of high velocity droplets. The different coating system will show different dynamics in shock wave damping and reflection. These results will be correlated with the experimental data gained from the DIEM. The aim of the project is to produce a method to assess and rank different coatings in a computationally efficient and representative way in contrast to the current norms.

36 Anne O'Mahony - Department of Education

Views of Transformative Learning, Perspective Transformation and Transformative Education – a comparison of conceptions in the literature.

The process and outcome of learning concerns change. In the breadth of literature on learning one type of change has generated significant interdisciplinary research: Transformative Learning. The theory, initially developed by Jack Mezirow in the1970s, described the experiences of individuals that prompted and produced personal change that was so profound it was considered a transformation. Mezirow's exploration of the staged process (Mezirow, 1978, 1991, 2012) of that change inspired and influenced others. Over the years it has become a foundational theory of adult education. As a theory, it has been extended, expanded, and applied across a range of contexts with diverse aims and objectives by scholars in North America, Europe and beyond. It has been criticised, refined, and reconceptualised (Newman, 2012; Hoggan, 2016). It has been developed to include, and promote, both personal and collective changes. In the process of this expansion of the theory, three related terms have emerged: Transformative Learning, Perspective Transformation and Transformative Education. This review set out to examine the seminal and influential works across the forty years of Transformative Learning literature and to explore the relationships between the terms Transformative Learning, Perspective Transformation and Transformative Education. These works were used to map the evolution of the definitions and the relationships between them and the factors that may have influenced the development of the theory. In addition, the trends in how, and where, the concepts are being studied and applied in recent literature are explored.

37 Sylwia O'Rourke - Department of Humanities

Wired and developing: the perceived role of Digital Interaction in Early Childhood Education and Care"-the systematic review of literature.

Digital technology has become a big part of everyday life, especially since the invention of the Internet and portable devices, such as a smartphone or a tablet. The extent of this permeation is referred to by some as 'online/offline hybridity' (Šimůnková, 2019),a virtual and real time existence in interlinked spaces. The youngest generations are part of this world. They observe, imitate and question many of our actions, routines, and rituals. Therefore, it is no surprise that their digital interactions increased in the last decade (Ofcom, 2022). While personal and home uses have been explored within the literature, research on digital technology within Early Childhood Education and Care is still in its infancy. This research pushes boundaries to investigate what technologies are being used by children in the ECEC centres as well as the perceived impact of such on their cognitive and socioemotional development. The initial research phase of a systematic review began in February 2023. To date 4,885 studies were extracted from 5 databases, using specified inclusion/exclusion criteria. 939duplicates were eliminated. Currently, approximately 400 studies are unresolved, pending the next decision-making process, where the final number of studies for inclusion for full text review, will be made. Within the included research, a diverse range of digital tools and creative strategies are evident. Among the patterns within the excluded articles are studies on attitudes of Early Years educators and parents towards technology integration within the sector and once-off interventions. This paper will also give insights into the experiences of completing a systematic review.

38 Adam Stead - Humanities (Wexford)

Community and Communication: The future of 21st Century agriculture

Over the past two decades, farming practices have changed radically. The perception of farming, held by members of the non-farming community, has also changed. With the intensification and mechanisation of agriculture, issues such as water pollution and biodiversity have come to the fore. At the same time, the increased use of social media along with the urbanisation of the Irish population has meant that these concerns have gained more attention, and, in certain cases, exaggeration, as far as many farming families are concerned. The fact that farmers are, more often than not, custodians of the environment and make many positive contributions to nature, is often overlooked. Any work that can bridge the gap between these differing perceptions, while still being realistic about the challenges that no doubt exist, is welcome and necessary. This presentation will focus on examples of visual arts projects in Ireland which show how they can successfully interpret and redistribute both lost and new knowledge sets as well as mediate the complex narratives of farming in the 21st century to wider audiences.


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