SciFest 2021

National Final

Project Abstracts

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November 2021

SciFest@TUS Athlone 2021

STAND 1

Title of Project: The Last Straw!! The Impact of Microplastics on our Inland Lakes

Student: Hannah Duffy

School: Our Lady's Bower, Retreat Rd., Athlone, Co Westmeath

Teacher Mentoring Project: Ellen Maguire

ABSTRACT

Microplastics are tiny plastic particles (<5mm) that persist in water, soil and now is reported to be getting into the food and drink we consume. The big issue is that the microplastics do not decompose and can persist for decades. Plastics which can vary in composition have been found to readily bind to and adsorb other harmful chemicals which pose a threat to wildlife and human health. This project addresses this problem and involves the analysis, quantification, and impact of microplastics on Ireland's inland lakes.

Sediment/silt and water samples were taken from the lakeshore of Lough Ree (Coosan Athlone, Killanure Ballykeeran, Hodson Bay Co. Roscommon), Lough Ennel (Mullingar), LoughRea (Co. Galway). A NaCl solution was prepared at a density of 1.2g/cm^3 so that lighter microplastic particles could be separated based on their buoyant densities. Water samples were also taken from the water's surface layer at each location in 500ml quantities. These samples were then filtered onto 0.4mm filter discs were analysed using a motic stereo microscope. Photos were taken at a magnification of x40 with my camera phone.

RESULTS

The highest number of microplastics was found in the silt samples from Lough Rea (672mp/100g) and the lowest at Lough Ree, Killanure (380mp/100g). Water samples showed highest levels of microplastics at Hodson Bay (328mp/L) and lowest at Lough Ennell (229mp/L). The average amount of microplastics found in the inland lake sediments was 538 +/-117 microplastics/100g and a lower count of 288 +/- 43 microplastics /Litre in water samples.

SciFest@LyIT 2021

STAND 2

Title of Project: Building an Automatic Weather Satellite Ground Station with Data Analytics

Student: Hari Pranavam

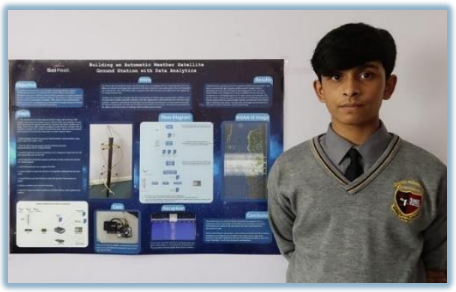
School: St Eunan's College, Letterkenny, Co Donegal

Teacher Mentoring Project: Michael Harkin

ABSTRACT

Objective:

My mission is to build a low cost, portable and energy efficient weather satellite ground station, to automatically receive weather information throughout the day. The system is using a Raspberry Pi, a low power consumption computer, which allows it to be powered by a battery-pack. Such a system/set-up can be useful for people who go to the sea on a regular basis, such as fishermen and sailors.



Brief outline of steps:

- Build a QFH antenna (used to receive NOAA 15, 18 & 19 signals) using copper wiring, plastic piping and a coax cable.
- Test the QFH antenna.
- Set up the Raspberry Pi by installing the Raspbian Operating System and installing the necessary software.
- Integrate everything together using scripts to work automatically using cron scheduler.
- Build a sealed case for protection and use a battery-pack for portability.

Results

Currently, I have received a few images with actual clouds. It is dominant with static, as those were the parts where the signal was weakest. This is mainly due to the bad climate here in Ireland during my test period.

Conclusion

The project was successful and I was able to automatically get frequent satellite weather images without spending over €100, even if the data in the images aren't rich. The ground station worked with open-source software for automated processing.

Overall, the information can result for better humanitarian purposes such as unbiased weather information for the fishermen and sailors community. Performing such research will open doors for many innovations and discoveries as well.

SciFest@DCU 2021

STAND 3

Title of Project: CareerCoaster - The Ultimate Career Guide for Secondary School Students

Student: Mony Aramalla

School: St Mary's Secondary School, Glasnevin Holy Faith Covent, Glasnevin Dublin 11

Teacher Mentoring Project: Bronwyn Mulvey

ABSTRACT

"Choose the right job and you'll never have to work a day in your life." - Confucius. Choosing the right career path might be the most challenging task especially for secondary school students who have little understanding of the workforce.

My project is the development of an android app that provides students with an up-to-date analysis of career sectors, what they involve, what skills are required and finding courses in an interactive way. My app helps students discover their interests to choose a perfect career path that would perfectly suit them.

My hypothesis is, that if secondary school students can avail a career guide with a full analysis, it has the potential to help students understand and pick a career field that they enjoy fully, without facing difficulties throughout their life by picking the wrong career.

I researched some gender bias present in the choice of career paths and how this subsequently influences the career choice of students. Some of these statistics were worrying for example, in Ireland, only 8.5% of nurses are male and 15% of engineers are women.

As part of my research methodology, I conducted a survey to find out the career interests and influences on teenagers in secondary schools. I also asked teachers at my school to describe their experience of college applications and careers. I contrasted these with the students' opinions. I also gathered information from my guidance counsellor about students' course choices and career patterns she has seen over the past few years.

SciFest@GMIT 2021

STAND 4

Title of Project: Home Spectral Analysis

Student: Jonathan Flanagan

School: Presentation College, Headford, Co. Galway

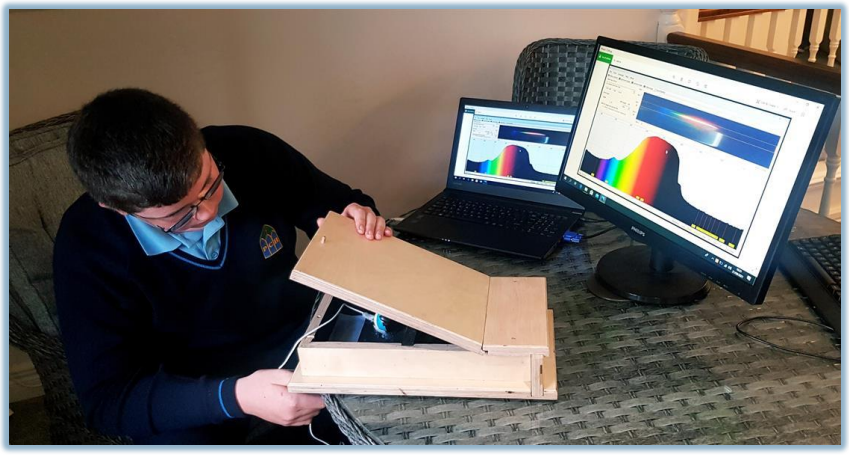
Teacher Mentoring Project: John Toner

ABSTRACT

There were two purposes to my project Home Spectral Analysis. Number one was to show people that anyone can build high performing lab equipment within their own home and without having to spend significant amounts of money. The second aim was to investigate the Purkinje Effect; a biological effect that causes us to perceive light as being blue in low-light situations.
My project consisted of two devices:

- A home-built digital spectrometer which is constructed from birch veneered plywood which consists of a lens, diffraction grating and web camera.
- A large home-built light collector to act as a photon bucket, constructed from mylar due to its high reflectivity.

Two versions of the photon bucket were constructed: one rectangular reflector which was constructed from recycled timber and one circular reflector made from a large recycled flowerpot. Both were sealed using builder's caulk and used a mylar blanket reflector. The photon bucket was used to improve the signal-to-noise ratio when acquiring the spectrum of moonlight. Both models were compared to find out which one had the greater surface area and which has the better focus.
When addressing the second aim of my project, I gathered the spectra of both sunlight and moonlight, comparing them to show how similar they are. My data showed that the moonlight had a smaller blue component in its spectrum than sunlight, in line with Ciocco and Wang (2013). This proved that when people see things as more blue in moonlight, it is due to the Purkinje Effect.



SciFest@MTU Tralee

STAND 5

Title of Project: OnlineOffline

Students: Adam Dineen, Michael Guerin

School: Mercy Secondary School Mounthawk, Mounthawk, Tralee, Co. Kerry

Teacher Mentoring Project: Eimear Nolan

ABSTRACT

During the coronavirus pandemic in Ireland copious amounts of people were sent home to continue work online. Since a lot more people were working from home, more people were going to be met with online scams.
Our project "OnlineOffline" aimed to develop a board game to raise awareness on the topic of cybersecurity.

We created a survey to ask people about their understanding of the internet. We wanted to see what the general public did and didn't know about cybersecurity, so we could know what to inform them on in our board game. We sent the survey out online. We asked questions like "Have you ever been affected by online scams?", "How secure do you feel online?", "Which of the following would you consider the most secure password?" Our survey was answered by around 700 people.

The next step was to make the board game. Educating people about cybersecurity was our main criteria. After multiple design tests and focus groups, we came up with a design that we were happy with. Our final design was made up of a variety of different hexagonal tiles that are placed down randomly every time the game is set up, this makes the game different every time that it is played. Different coloured tiles have different effects. There are trivia cards which will educate people on cybersecurity.

To conclude we accomplished our goal of designing a board game that educates people about cybersecurity. Our survey also created awareness around the topic of cybersecurity.

SciFest@TU Dublin Blanchardstown 2021

STAND 6

Title of Project: The Gamification of Man-to-Man Defence

Students: Charlie Rice, Kerry Atowo, Joshua Gaffney

School: St Joseph's Secondary School, Convent Lane, Rush, Co. Dublin

Teacher Mentoring Project: Daryl Dunne

ABSTRACT

This project was originally made to teach people how to social distance, teaching people how to gauge 2 metres. Building on this idea we re-engineered our technology to combine our love of basketball. All three of us play basketball on a school basketball team, so we decided to use the same technology that we used for our social distancing idea to develop a device that can help people improve their defence.

Our device is made from a Micro:bit. Using the micro:bit's radio sensors and the signal strength function we found the signal strength that perfectly simulates 2 meters, which we found was around -55. We then made a point system that we used to reward participants called life points. Everyone starts at 100 life points. When the received signal strength is above -55, life points would begin to drain and this would be indicated by a -1 on the led screen.

We also have an accompanying website that shows 'Life-points' remaining after a training drill, which coaches can use for a statistical analysis. We did this so coaches can compare players with their previous training sessions, to see their improvements.

We carried out our main experiment with two groups, the 'Open & Blind' group. The Blind Group were given a micro:bit and told to train like it's a normal defence drill. The Open Group were also given a micro:bit, but we explained how our device works and how they would lose points when they're more than 2 metres away.

Our data shows that there is a significant difference ($p=0.0003$) between the Blind and Open groups. This evidence clearly shows the value of our device in training correct distancing when defending. Unfortunately, due to Covid-19 restrictions we have not been able to carry out our experiments to the scale we had planned but we still believe our device has a lot of potential.

SciFest@WIT 2021

STAND 7

Title of Project: Temporal Mechanics: The Hidden Theoretical

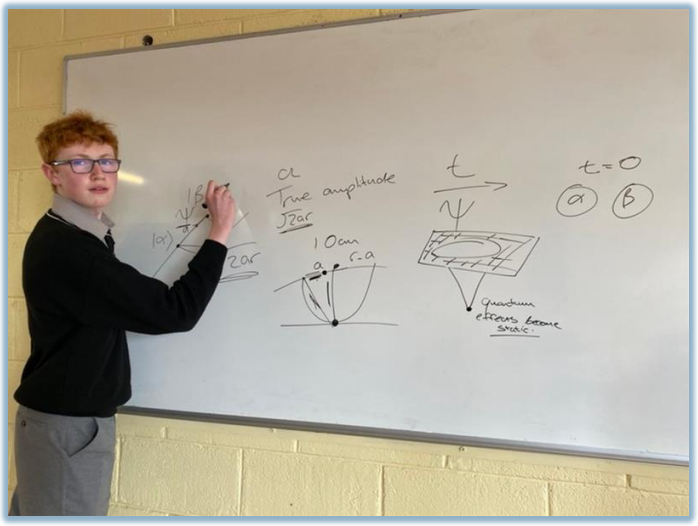
Student: Conor Fitzmaurice

School: St. Kieran's College Secondary School, College Rd, Kilkenny

Teacher Mentoring Project: David Hennessy

ABSTRACT

My project describes a successful theory for the relation between quantum (and relative) events and their perspective through time. It is based on my theoretical law that particles are absent from the linear view of time. My project vividly reimagines our concept of quantum mechanics through the nature of temporal interactions outside a localised temporal system, supported by a notion of quantum fluctuations being a proof of a curvature principle, that curvature is quantized and limited. If a particle is deficient to this, it loses its grasp on time, inverse to an idea of time dilation. This idea lays new interpretations for quantum events (including superposition and entanglement), the idea of conscience, and has many implications in the study of black holes and their structures, primarily the singularity, due to the quantum information passed from a singularity via temporal mechanics. The interactions between separate timelines gives evidence towards parallel universes, and specifically an infinite quantity, therefore a multiverse. In timeline interaction, temporal cycles are the measurement of quantum values, rebounding information to the singularity, causing a Big Bang, essentially cycling through a universe again. The state of a multiverse would be based upon a Bloch sphere, as timelines produce infinitesimally unique differences based upon their vector quantity and thus represent a superposition in themselves, where the multiverse is concerned, it is represented by a quantum system in itself. The applications of such a theory are limitless, from uses in large quantum networks, black hole structures and astrophysics.



SciFest@GMIT 2021

STAND 8

Title of Project: Real or Fake

Student: Diarmuid Hayes

School: Coláiste Iognáid S.J., Br. Na Mara, Gaillimh

Teacher Mentoring Project: Eimear Hennelly

ABSTRACT

We are surrounded by data everywhere. I began to question the data around me. As I read about fake news, election vote fraud, and even the numbers of Covid-19 deaths, the big question for me; is the data real or fake? I was inspired to investigate and find out what was available to test if data real or fake.

From my research I discovered a law in nature called Benford's Law that all data follows. If the data does not follow Benford's Law, then the data is likely fake and possibly manipulated either on purpose or accidentally.

I have developed a Dashboard test that incorporates Benford's Law, statistical and graphical techniques to test if data is real or fake. I developed my Benford Dashboard Tester into a more user-friendly application so that anyone can test data quickly and efficiently.

I have widened my usage of my Dashboard to make it more available as soon as the data is created so data can be tested straight away to provide feedback to the user quickly so that data is always tested before being shared with others. It will be helpful for scientists or students to be used as an analytical tool to check that their data is not biased in any way.

Also, my dashboard will help identify if images or videos are fake or real so that public can be made aware of fraud, fake news, or scams. Finally, my dashboard can be adapted into an application that is unique and patentable.

SciFest@IT Sligo 2021

STAND 9

Title of Project: Liposome Technology and its Potential in the Future of Medicine

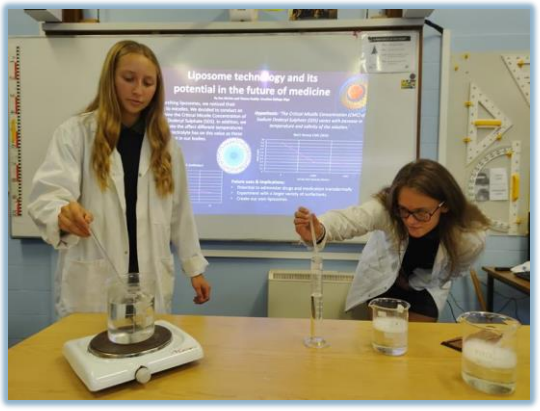
Student: Zoe Melvin, Cianna Ruddy

School: Ursuline College Sligo, Finisklin, Sligo

Teacher Mentoring Project: Anthony Carolan

ABSTRACT

For this project we examined micelles and their ability to administer drugs or medication. We examined the critical micelle concentration (CMC) of 10% Sodium Dodecyl Sulphate (SDS) at different temperatures, in the presence of electrolytes (NaCl) and in varying pH solutions. We decided to test the effect each of these have on the CMC as these are a range of different conditions that micelles would interact with within the body, when used to deliver medication. Our hypothesis was *'The Critical Micelle Concentration (CMC) of Sodium Dodecyl Sulphate (SDS) varies with increase in temperature, salinity of the solution and varying pH's.'*



We tested our hypothesis by adding single drops of SDS using a plastic dropper into solutions with different temperatures (20°C, 30°C, 40°C, 50°C), varying pHs (pH 2, pH 4, pH 7 and pH 8) and varying concentrations of the electrolyte Sodium Chloride (0.001Mol and 0.0005Mol). Through conductance we were able to determine the CMC of SDS in each of these solutions. From our results, altering temperature and the presence of electrolytes have little effect on the CMC. With pH 8 and pH 4, the concentration of SDS required was much greater than before. Whereas pH 2 had the opposite effect with a much faster production of micelles.

Micelles are extensively studied carriers for the delivery of poorly water-soluble drugs. There is huge potential for their use in administering drugs such as anti-cancer treatment.

SciFest@TUS Thurles 2021

STAND 10

Title of Project: Give me that ENERGY!

Students: Kaitlyn Ryan, Kayleigh Cronin

School: Coláiste Mhuire Co-Ed, Thurles, Co. Tipperary

Teacher Mentoring Project: Katie Carr

ABSTRACT

We have created a digital form of our school's wellbeing program, our app is a reliable resource for anyone that may wish to use it. It gives the user the ability to have our ENERGY program on hand at any time and provide resources to "pave a pathway to positive wellbeing." We focused our project on the junior side of the school as they are adapting to change in their environment coming from primary school and may need the extra support. For their first three years they use the ENERGY program and become familiar with each aspect of it. They are then given an opportunity to share those skills as they advance to senior cycle where they are faced with the option of becoming an ENERGY leader. There are 14 ENERGY leaders which offer peer-based support to junior students. We have adapted the program to suit the current needs of our target audience and have added extra features such as links to our school's student support team (members of staff), information on each aspect (benefits,tips/tricks etc.), a COVID resource page and links to external supports (Jigsaw, BelonG To etc.) We want to reduce stress levels in young adolescents whether they're finding it hard to adapt to the change that adolescence brings, or just need tips on how to deal with daily tasks/struggles. We hope to empower young people to first believe they can achieve and maintain great wellbeing and secondly, actually achieve it and share those skills with others.

SciFest@TUS Limerick 2021

STAND 11

Title of Project: Using Magnets to Help Prevent Heart Attacks

Student: Ethan Kirwan, Jack Kelly

School: Desmond College, Station Road, Newcastle West, Co. Limerick

Teacher Mentoring Project: Donal Enright

ABSTRACT

Heart disease is the most common cause of death in Ireland. 6,000 people have heart attacks in Ireland each year but many of these can be prevented. Irish women are 6 times more likely to die from cardiovascular/heart disease than from breast cancer. If a person's blood becomes too thick it can damage blood vessels and increase the risk of heart attacks. Currently, the only method for thinning blood is through drugs such as aspirin; however, these drugs often produce unwanted side effects.

Because red blood cells contain iron, we believe that is possible to reduce a person's blood viscosity by 20-30 percent by subjecting it to a magnetic field of 1.3 Tesla. The magnetic field polarizes the red blood cells causing them to link together in short chains, streamlining the movement of the blood.

In pascal-seconds (Pa·s), the viscosity of blood at 37 °C is normally 3 × 10−3 to 4 × 10−3. Blood viscosity can be measured by viscometers capable of measurements at various shear rates, such as a rotational viscometer.

We're both part of the young generation. Because of that we want to be able to apply science as best we can to help improve and build upon our society. If magnetic fields can be implemented to help people who suffer from high blood viscosity it could help lengthen their lifespan and improve upon their daily lives.

SciFest@NorthWest

STAND 12

Title of Project: Investigating the Effectiveness of Various Face Masks Against COVID-19 Virus and Aerosol Droplets

Student: Maeve Stillman

School: St Mary's College, 35 Northland Road, Londonderry

Teacher Mentoring Project: Ann Blanking MBE

ABSTRACT

This investigation will determine the efficacy of a range of face masks to determine a safe, commercially available alternative to surgical masks for the public to use.

The masks were tested for their ability to withstand the transmittance of nanoparticles though them. Nanoparticles were chosen as they are similar in size to the COVID-19 virus, safe and their mass is easily determined. The mask samples with the least transmitted nanoparticles will be the most effective at blocking the passage of Coronavirus.

I designed a Bacterial Filtration Efficiency (BFE) method, testing the mask's performance in withstanding the transmittance of magnesium oxide (MgO) utilising a water pump.

I have furthered my research by developing a Splash Resistance Test, which examines the mask's ability to protect the public from expelled airborne droplets (coughs and sneezes).

Overall, all the masks had 88% or higher efficiency ratings in the BFE testing (range 0.00 – 0.06g transmittance), however any magnesium oxide passing through the mask materials at all represents potential Covid-19 entering the body and causing an infectious disease. I found in the Splash Resistance testing that the polycotton, reusable mask performed poorly, having the highest increase in mass of 0.28g. This mask should not be used to prevent aerosol transmission of Covid or any infectious agents of this size.

The transparent masks prevented the passage of 100% of the magnesium oxide in this study. It is therefore a viable, alternative mask for the public to use, freeing up vital PPE for the NHS and Care Workers.

SciFest@TUS Athlone 2021

STAND 13

Title of Project: Cosmic Radiation Protection Simulation

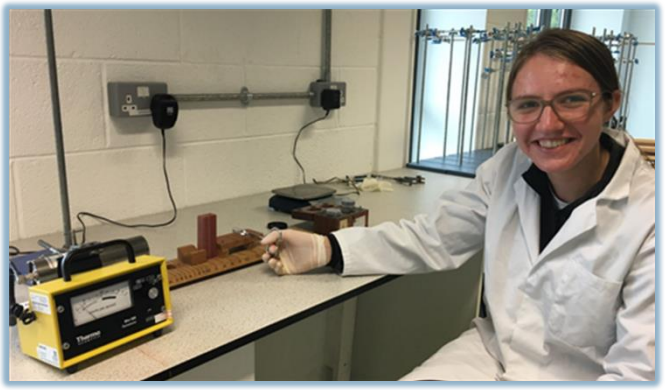
Student: Clare Reidy

School: Our Lady's Bower, Retreat Rd, Athlone, Co Westmeath

Teacher Mentoring Project: Julie-Anne Greaney

ABSTRACT

The aim of this project was to investigate whether Martian regolith could be used to block cosmic radiation and if so to construct the optimum brick using Martian regolith simulant as a primary component.



This project consisted of 2 parts:

Part A involved the composition of two Martian regolith simulants namely Viking Lander 1 and Pathfinder. The effectiveness of these Martian regolith simulants at blocking a, b and g radiation was tested in the lab using a Geiger Müller tube and a Panax demonstration kit. Both Martian regolith simulants were found to have a high mass attenuation coefficient i.e. they effectively blocked g radiation. The results from Part A indicated that the regolith simulants could offer protection against cosmic radiation.

Part B of the project focused on developing the optimal method for making a brick from the regolith simulants made in Part A. Bricks were successfully made from blends of the regolith simulant Viking Lander-1 and varying percentages of the polymers polyethylene (PE) and polyethylene oxide (PEO). This was carried out using a hydraulic press and a specially designed steel mould at high temperature and pressure. 10 bricks were constructed and the effectiveness of each was measured using a Geiger Müller tube and a g radiation source of Radium 226. A comparison was made between the PE and PEO bricks. The optimum brick consisted of 20% PE and 80% Viking Lander-1 regolith.

The results of this project strongly support the use of Martian regolith to protect future inhabitants of the red planet.

SciFest@IT Sligo

STAND 14

Title of Project: Keep a Clear Head – An Investigation into the Observed Physiological Brainwave Effects, when present within Interfering Domestic Electromagnetic Fields

Students: Niamh Carolan, Líle Hensey

School: Ursuline College Sligo, Finisklin, Sligo

Teacher Mentoring Project: Anthony Carolan

ABSTRACT

An individual's behaviour, emotions, and thoughts are communicated between neurons within our brains. Brain waves are oscillating electrical voltages in the brain measuring a few millionths of a volt. These neural oscillations are the result of masses of neurons communicating with each other. We hypothesize that the emission of electromagnetic radiation from common electrical devices in a domestic environment negatively affects the focus and concentration of those working in proximity to them by impacting the neural oscillations of the individuals in question. We conducted over 100 tests analyzing this hypothesis in relation to three main appliances, mobile phones, WIFI, and microwaves. We recorded the implications of these tests on Alpha, beta gamma theta and delta waves in the brain.

SciFest@MTU Cork 2021

STAND 15

Title of Project: CAN-TEENS Make Better Food Choices?

Students: Caoimhe Walsh

School: St. Brogan's College, Kilbrogan, Bandon, Co Cork

Teacher Mentoring Project: Karen Corbett

ABSTRACT

The essence of my research is the overall lack of nutritional knowledge and the poor nutritional choices made by teens in their school canteens. Numerous studies have proven that poor nutritional choices made in adolescent years can have many negative long-term health effects such as bone health deficiencies, weight control, cardiovascular disease and colorectal cancer. A study by the Nutrition Society (2015) proved that schools are providing many of the foods that contribute to high sugar and fat intakes among Irish adolescents. My project aimed to investigate the current attitudes and nutritional knowledge of adolescents towards school canteen meals, to introduce a traffic-light system into my school canteen and to develop an informative, easy to understand website on adolescent nutrition.

My experimental methods involved:

- Interviewing students to establish opinions on the canteen meals currently available
- Introducing two additional healthy meals
- Devising my traffic light system using Nutritics Software and website using Wix
- Introducing my traffic light system and website
- Tracking orders and undertaking surveys before and after the introduction of the traffic light system and website (n=300)
- Interviewing members of the Irish Heart Foundation and BiteBack 2030
- Improving the least healthy meal and introducing the improved version
- Analysing all results using SPSS Software

In conclusion, my study proved that adolescents are currently making poor nutritional choices and currently have very low knowledge with regard to their nutritional requirements. However, my experimental methods determined that a traffic-light system and website helps adolescents to make better food choices.

SciFest@TU Dublin Tallaght 2021

STAND 16

Title of Project: Does the Act of Melting Cheese Affect our Perceptions of it?

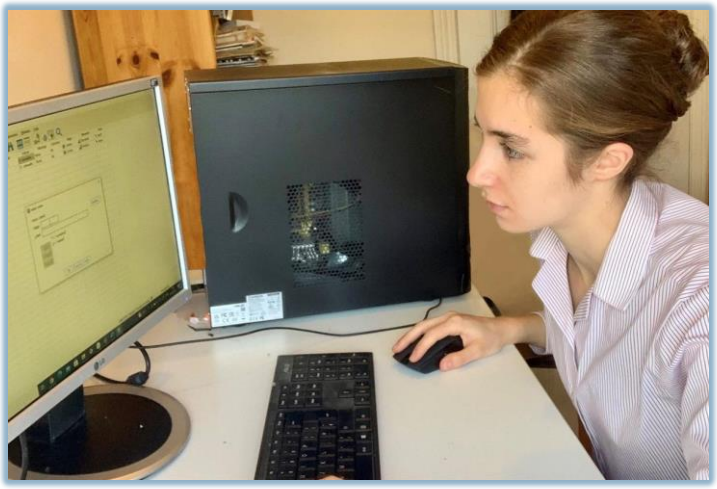
Student: Anna Holloway

School: Loreto College, St Stephen's Green, Dublin 2

Teacher Mentoring Project: Louise Kerr

ABSTRACT

Objectives: This project investigated whether perceptions of how healthy a food is can be affected by a factor that does not actually affect the healthiness of the food, and if that same factor affects how appetising the food is. I did this by comparing perceptions of melted and unmelted cheese. My hypothesis was 'Our perception of melted cheese differs from our perception of unmelted cheese'.



Methods: Two independent, age-matched samples were shown images depicting melted or unmelted cheese and asked to rate the food depicted on Likert scales from unhealthy to healthy, and unappetising to appetising. They were asked to do the same with two distractors/controls.

Results: The p-values for the results regarding perceived healthiness that I calculated the 2 Sample t-Test and the Mann-Whitney U Test to quantify the likelihood that the differences observed occurred due to chance were deemed statistically significant. Those regarding appeal were not. As the results of the study are unlikely to cause changes with significant associated risk, a p-value lower than the conventional 0.05 was deemed unnecessary.

Conclusions: These results support the hypothesis, as perceptions of cheese were affected by whether or not it had been melted. This indicates that the perceived healthiness of food can be affected by a factor that does not actually affect how healthy it is.

SciFest@TUS Athlone

STAND 17

Title of Project: 'It's the Small Things' – An Investigation into the Division of Emotional Labour in the Home and Suggestions on how any Gender Imbalances can be Rectified

Student: Katie Harlow

School: Meánscoil Muire gan Smal, Convent of Mercy, Roscommon Town

Teacher Mentoring Project: James McLoughlin

ABSTRACT

The purpose of this project is to investigate the division of emotional labour in the home, the extent to which there exists a gender imbalance in the division of this labour and to make suggestions as to how any gender imbalances can be rectified.

This project relies on an in-depth survey using data from 2673 respondents, divided into 12 groupings. Major findings from my analysis of these groupings indicated that the burden of emotional labour in the home fell disproportionately on women. One finding showed that 97.4% of 351 women in a heterosexual relationship and co-habiting or living alone said the burden of emotional labour falls more on women. 83.4% of 351 men in a heterosexual relationship and co-habiting or living alone said the burden of emotional labour falls more on women. In the same sex grouping, emotional labour was more evenly distributed: 75% of the respondents in a same sex relationship stated that in their homes emotional labour is shared evenly.

The findings show that the uneven division of emotional labour in the home is a cause of conflict, stress and exhaustion in women. The project concludes that significant steps are required to correct this uneven division of emotional labour in the home. These steps include avoiding gender stereotyping in children from birth, in our treatment of children, and the example adults should show them. The project concludes it is important for partners in a home to have designated emotional labour tasks assigned to them to avoid gender imbalances.

SciFest@DkIT 2021

STAND 18

Title of Project: The Effects of ASMR on Stress Levels and Loneliness in Teenage Girls

Students: Isabella Watts, Hiba Shahzad

School: Loreto Secondary School, Balbriggan, Co. Dublin

Teacher Mentoring Project: Brian Higgins

ABSTRACT

Our project investigated the effects that ASMR has on stress levels and loneliness in teenage girls by measuring skin temperature, change in heart rate, Perceived Stress Scale (PSS), and Loneliness Scale (UL-8) scores.

A sample of 280 female students aged 12-16 (~ 70 students per year group) were divided into four treatment groups: ASMR sound only video, ASMR spoken video, positive control (guided mindfulness meditation video) and negative control (eye makeup tutorial lacking ASMR triggers).

Heart rate (paired t-test results): All groups except the negative control experienced a statistically significant average drop in heart rate ($p < 0.05$).

Temperature (One-way ANOVA + Tukey Post Hoc test results): ASMR did not cause a statistically significant change in skin temperature compared to positive/negative control.

Perceived Stress Scale (One-way ANOVA + Tukey Post Hoc test results): The PSS scale showed a significant difference ($p < 0.05$) between spoken ASMR (average 33.74) and the negative control group (average 29.34). Compared to the non-ASMR control group: ASMR may cause people to feel more stressed.

Loneliness Scale (One-way ANOVA + Tukey Post Hoc test results): ASMR has an effect on loneliness compared to the negative control group ($p > 0.05$). The mean score of the loneliness scale for the spoken ASMR was lower than the negative controls' mean, indicating ASMR increases levels of loneliness.

Conclusion

ASMR does reduce heart rate. According to our results, ASMR causes an increase in perceived stress scale and UL-8 loneliness scale scores. ASMR does not have an impact on skin temperature.

SciFest@TUS Limerick 2021

STAND 19

Title of Project: 'Cov-idiosynchrasies': An Exploration of Factors Associated with Non-Adherence, amongst Irish Adolescents, with Public Health Behavioural Recommendations during the Coronavirus Pandemic

Student: Orna Collins

School: Castletroy Community College, Newtown, Castletroy, Co. Limerick

Teacher Mentoring Project: Ellie Murnane

ABSTRACT

Adolescents and young adults were identified internationally as a group with low compliance rates with public health measures aimed at curbing the spread of COVID-19. In mid-March 2020, the World Health Organization issued a special appeal to young people for increased compliance. This group often displays only mild or no symptoms of COVID-19, while still being infectious according to the National Public Health Emergency Team. Therefore, 'their potential for spreading the virus is high, considering that they have quite active social lives'.

Due to the lack of a 'chemical' vaccine, governments have had to rely on what could be termed 'a behavioural' vaccine (hygiene, social distancing measures, restricted movements etc.) to suppress the virus. Warnings that the disease will be endemic in society for perhaps years to come and certainly until a definitive treatment becomes available for ALL, have been issued by the WHO. It is therefore, important to identify barriers and facilitators of adherence to public health measures to inform current and future public health debate and design effective communication strategies. Even with the roll-out of a COVID-19 vaccine in 2021, Dr Lorraine Nolan warned that vaccines will not bring an end to the pandemic but should be regarded as an additional measure in the continued fight against COVID-19 - signposting the need for ongoing adherence to behavioural measures to limit the pandemic.

Rather than vilify those who appear to have difficulty engaging with public health guidelines to curb the pandemic perhaps a better approach is to uncover the factors which contribute to this pattern of non-adherence and to develop nuanced public health and communication strategies to address the core issues. This project seeks to achieve this objective.

SciFest@DkIT 2021

STAND 20

Title of Project: A Statistical Analysis of Young People's Awareness and Attitudes to COVID-19 in Ireland

Students: Caleb Kiely, Binh Hanratty

School: Coláiste Dún an Rí, Kingscourt, Co. Cavan

Teacher Mentoring Project: Robert Lorenz

ABSTRACT

The inspiration for this project stemmed from initial observation at the beginning of the 2020 and 2021 academic years: that students were reluctant to follow public health guidelines such as mask-wearing and social distancing.

We acknowledged that if our hypothesis – young people fail to comply with the guidelines despite being informed about them – could be proven true, we could contribute to positive change.

We conducted some background research and found younger males were the most likely to take health risks. However, little to no data was available on under 18s.

We circulated a survey in both 2020 and 2021 to several schools in the CMETB region. Our survey tested awareness, attitudes, and in 2021, COVID-19 vaccination response. Respondents provided their age and gender to investigate these factors. In 2020 we also asked what might incentivise students to follow the guidelines.

In our results, teenagers showcased impressive levels of awareness spanning multiple areas of COVID-19. Students' attitudes were poorer, e.g. in their tendencies to avoid social distancing. In 2021, a male/female and age group divide was discovered whereby males were less compliant with social distancing and mask-wearing, especially those 15-18. Students were educated and optimistic towards COVID-19 vaccines, although those against the vaccine mainly encompassed 12-14-year-old males.

We compiled a brief report of our findings, which we communicated to the HSE and management in Coláiste Dún an Rí, in the hope our project will inspire solutions. We conducted a scientifically valid study which opens many doors for further research in the future.

SciFest@DCU

STAND 21

Title of Project: Do Virtual Escape Rooms Help Students to Learn About Laboratory Experiments?

Student: Claire Johnson

School: Loreto Secondary School, Balbriggan, Co Dublin

Teacher Mentoring Project: Brian Higgins

ABSTRACT

Research question: 'Do virtual escape rooms help students to learn about laboratory experiments?'

Method

2nd year students were randomly assigned to a Game Group (GG, n = 76) or Laboratory Group (LG, n = 62, control). The GG completed a virtual escape room that I made on Scratch on the topic of electronic circuits and included PhET circuit simulations mimicking the LG's activities.All groups completed a quiz on the content covered. Twenty 1st year students also completed the GG activity to see if learning styles are associated with getting correct answers in the quiz. An improved game was developed and tested on twenty 1st year students.

Results

The LG scored 1.53 points higher on average (17%) than the GG according to the t-test ($p = 8.9$ ✕), performing best on questions 1,3,4,7 and 9 (chi-square test, $p < 0.05$). There was a strong negative correlation between auditory learning and test scores ($r_s = -0.6, p < 0.05$). The average scores of the original GG and the revised GG were not significantly significant ($p = 0.53$). The revised GG outperformed the original GG for question 8 (chi-square test, $p < 0.05$).

Conclusion

This virtual escape room game didn't help improve students' understanding of topics compared to performing the real laboratory experiments and higher auditory learning scores predict lower scores on the quiz ($r_s = -0.6$, $p < 0.05$).

The revised GG only did significantly better than the original GG on one question.

SciFest@MTU Cork 2021

STAND 22

Title of Project: Keep Calm and Carry On Breastfeeding

Students: Lucy Teape, Kate Lehane

School: St Brogan's College, Kilbrogan, Bandon, Co. Cork

Teacher Mentoring Project: Laura O'Regan

ABSTRACT

Ireland's breastfeeding rates are among the lowest in the world (Alberdi et al 2018). "Not breastfeeding is associated with lower intelligence and economic losses of about $302 billion annually or 0·49% of world gross national income. Breastfeeding provides short-term and long-term health and economic and environmental advantages to children, women, and society" (Rollins et al 2016). It is argued that school-based breastfeeding promotion programmes hold promise for increasing knowledge of breastfeeding and promoting positive attitudes where breastfeeding is the norm (Glaser et al 2015).

Our project analyses the attitudes of adolescence towards breastfeeding and implements an intervention programme. Sample size =250. After the analysis we found that 145 students believed that breastmilk was more beneficial than formula milk while 92 participants stated that they both held the same nutritional value. We also found that 213 students said that breastmilk would not increase the intelligence of the child. 44% of participants believed that breastfeeding would not have the ability to prevent infections in babies. Interestingly we found a significant correlation ($p<0.05$) between the participants' interest in breastfeeding/supporting a breastfeeding partner in the future and if they had been breastfed themselves. There was no correlation between if a participant was breastfed and where they lived (rural/city/town). When asked about their knowledge 227 students stated they have not been educated about the benefits. To address this, we carried out an intervention which proved that with correct education the attitudes towards breastfeeding can be improved resulting in students appreciating the benefits of breastmilk.

SciFest@IT Carlow 2021

STAND 23

Title of Project: "Lives are at Stake, When you're not Awake!"

Student: Chloe Dore

School: St Marys College, St Mary's Rd, Arklow, Co. Wicklow

Teacher Mentoring Project: Joanne English

ABSTRACT

It is estimated that driver fatigue is a contributory factor in as many as 1 in 5 driver deaths in Ireland alone, with approximately 270,000 driver deaths being reported annually as a direct result of driver drowsiness on a Global scale. The purpose of this project was to investigate the parameters of identification of drowsiness in order to decipher which would be the most suitable to utilize and implement within an affordable, technological safety device that detects and combats driver fatigue, in addition to recognizing the equipment that is necessary to do so.

In order to do this, I contacted and interviewed a myriad of people with expertise in relation to this topic and gathered responses from the general public through a survey I created which allowed me to comprehend the general underestimation of the severity of driver drowsiness. I also conducted a biological experiment using a pulse oximeter in order to analyse the heart rate of a person with and without a sleeping disorder as they fell asleep. Ironically, it was the abnormal results of this experiment that diagnosed the aforementioned sleeping disorder that this subject has.

After eliminating the weaker methods of detection, I concluded that the optimum choice of parameters were those that relied on external factors, specifically head nodding and the degree of eye closure and duration of blinks. I was able to identify the requirement for electrooculography sensors for eyelid closure and inertial measurement unit sensors for the forward acceleration of the head.

SciFest@MTU Tralee

STAND 24

Title of Project: Nature Takes on Nature: Investigating the Effect of Juglone on Japanese Knotweed

Student: Grace Ni Ifearnáin

School: Gaelcholáiste Chiarraí, Tobar Mhaigh Dor, Trá Lí, Co. Chiarraí

Teacher Mentoring Project: Tríona Uí Mhaolchatha

ABSTRACT

The **aim** of my project was to:

1. Examine the correlation between Black Walnut tree and Japanese Knotweed.
2. Extract Juglone from the hulls of the Black Walnut tree and investigate the effect on the growth of Japanese Knotweed.

Part 1 was to determine whether there was a correlation between the two variables, the Black Walnut tree and Japanese Knotweed. This was achieved through surveys, observation, archival data (documents and records), Biodiversity Maps Ireland and semi-structured interviews.

Part 2 focused on extracting Juglone from the hulls and measuring 0.5 grammes to make up three solutions: distilled water, methanol, methanol and 1% ascorbic acid. The filtered solutions were analysed with a spectrometer and the reading did find the presence of a chemical, the highest reading in the methanol and 1% ascorbic acid.

The final part involved spraying Japanese Knotweed with the 3 solutions. The areas were sectioned off, pictures taken and roots and leaves sprayed every second day for one week. From the work carried out in this project it was shown that there was no Japanese Knotweed growing within 150 feet of Black Walnut trees. Of the three solutions, methanol and 1% ascorbic acid which had the highest reading on the spectrometer had a discolouration effect on the leaves of the Japanese Knotweed. The discolouration seen on the leaves on the Japanese Knotweed that were sprayed leads me to believe that the extractions did have a negative effect on the Japanese Knotweed, this will be monitored further.

SciFest@IT Sligo 2021

STAND 25

Title of Project: Investigating if Supplementing Ewes' Nutrition in the Latter Stages of their Pregnancy will Improve the Quality of Colostrum

Student: Jane Tempany

School: Ursuline College Sligo, Finisklin, Sligo

Teacher Mentoring Project: Anthony Carolan

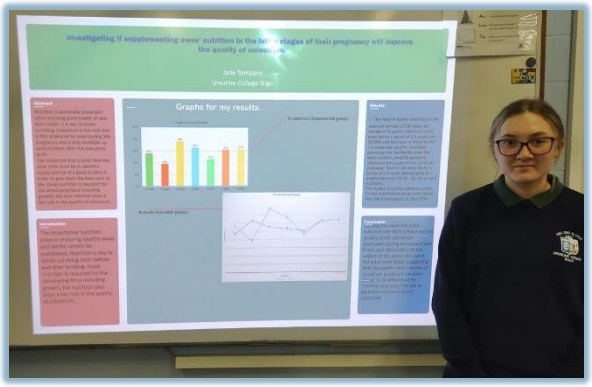
ABSTRACT

Nutrition is extremely important when ensuring good health of newborn lambs. Colostrum is the milk that is first produced by ewes during late pregnancy and is only available up until 24 hours after the ewe gives birth.

The colostrum that a lamb receives after birth must be in plentiful supply and good quality in order to give them the best start to life. Nutrition plays a key role in the quality of colostrum. In this experiment I investigated whether supplementing ewes' nutrition in the latter stages of pregnancy increased and improved the quality of colostrum produced.

Thirteen ewes were divided into two groups a control group N=6 which received the usual nutritional care and experimental group N=7 which were given extra feed that is high in protein, in the form of a blanket feed.

I discovered that supplementing ewes' nutrition with additional feed containing vitamins and minerals has a positive effect on the quality of colostrum.



The average % quality colostrum of the ewes not fed was 27.5% whilst the average of % quality colostrum of the ewes fed for a period of 2-3 weeks was 28.1%, and the average of those fed for a period of 3-5 weeks was 30.97% showing that feeding the ewes the extra nutrition pre-birth influenced the quality of the colostrum produced. It was observed the volume of colostrum increased in ewes after additional feeding compared to ewes that were given usual feeding but quantity of colostrum was not measured in this small experiment.

SciFest@ TU Dublin Grangegorman 2021

STAND 26

Title of Project: Goat's Milk vs Cow's Milk: Why can some People Consume Goat's Milk but not Cow's Milk?

Student: Zara Griffin

School: St Andrew's College, Booterstown Ave, Blackrock, Co Dublin

Teacher Mentoring Project: Emma Buckley

ABSTRACT

According to National Geographic, about 68% of the world's adult population can't digest milk and therefore many of them choose not to drink it. So many people dismiss milk, as a food group, because cows' milk, the milk that most people are accustomed to, does not suit them.

Milk is the first thing you consume in your life. Babies don't have teeth to eat food, but we still need nutrients to grow. The solution to this is milk. Most mothers produce enough milk to feed their babies completely for the first six months. This milk contains all the nutrients that a baby needs to be healthy. Sometimes after the baby is weaned, milk, which is so important for development, is then taken from the child's diet, because they cannot digest milk that comes from a cow.

Studies have shown that goats' milk is more similar in composition to breast milk than cows' milk. It contains a smaller amount of the protein casein, which so many people are allergic to. Goats' milk has a softer curd than cows' milk making it easier to digest. Goats' milk also contains less lactose.

Milk is so important in one's diet. It has too many necessary nutrients for it to be dismissed. Although some chose to switch to plant milk, this alternative is not considered nutritionally equivalent to milk that comes from an animal. All over the world, goats' milk is becoming increasingly popular as research shows that goats' milk can often be consumed when cows' milk can't.

SciFest@TU Dublin Blanchardstown 2021

STAND 27

Title of Project: Nitrates: From Water to River

Student: Luke Hanly

School: Castleknock College, Castleknock, Dublin 15

Teacher Mentoring Project: Tom Tierney

ABSTRACT

Introduction / Description of Project

In this project, I wanted to explore the consequences that farms, towns and rural places have on one of Irelands most prominent natural resources, rivers. Over the past few decades, agriculture intensification has been happening here in Ireland, and with more agriculture brings more fertilizer and slurries, which are the main reasons for water pollution in Ireland. Urbanization of rural Ireland is also having an impact. To understand the impact of both, I have tested two types of impacted rivers; The River Boyne, a large river running through towns, and my local river, The River Nanny, a small, rural river, that passes through fields and agriculture. We will compare the results with rainwater to ascertain the degree of contamination of water by nitrates.

Data

Agricultural land has a tenancy to be sprayed with fertilizer, which rolls into the river, creating nitrates. All test results are in ppm, or mg per litre. The average mg per litre is 0-10 mg per litre, and in the bar graph below, we see that many of the lines are above the 10 mark. This is likely to be challenging to many species in the rivers. Also, (given what I said above), the water that we tested above is not fit for human consumption due to this reason. I also tested my local river, the river Nanny, to see if its nitrate level is higher or lower than the River Boyne. I would predict that it might be slightly higher as it goes through a lot of agricultural land.

Conclusions

In conclusion, there is a significant accumulative contamination of rainwater between the time it falls and when it reaches the river. The relative levels identified through the testing process highlight the high level of accumulation of nitrates in rivers. This does have practical applications as it tells you what the cleanest water source is, and the investment required to ensure that tap water is clean.

SciFest 2021

BOSTON SCIENTIFIC MEDICAL DEVICES

Award Finalists

SciFest@TUS Limerick 2021

STAND 11

Title of Project: Using Magnets to Help Prevent Heart Attacks

Students: Ethan Kirwan, Jack Kelly

School: Desmond College, Station Road, Newcastle West, Co. Limerick

Teacher Mentoring Project: Donal Enright

ABSTRACT

Heart disease is the most common cause of death in Ireland. 6,000 people have heart attacks in Ireland each year but many of these can be prevented. Irish women are 6 times more likely to die from cardiovascular/heart disease than from breast cancer. If a person's blood becomes too thick it can damage blood vessels and increase the risk of heart attacks. Currently, the only method for thinning blood is through drugs such as aspirin; however, these drugs often produce unwanted side effects.

Because red blood cells contain iron, we believe that is possible to reduce a person's blood viscosity by 20-30 percent by subjecting it to a magnetic field of 1.3 Tesla. The magnetic field polarizes the red blood cells causing them to link together in short chains, streamlining the movement of the blood.

In pascal-seconds (Pa·s), the viscosity of blood at 37 °C is normally 3 × 10−3 to 4 × 10−3. Blood viscosity can be measured by viscometers capable of measurements at various shear rates, such as a rotational viscometer.

We're both part of the young generation. Because of that we want to be able to apply science as best we can to help improve and build upon our society. If magnetic fields can be implemented to help people who suffer from high blood viscosity it could help lengthen their lifespan and improve upon their daily lives.

SciFest@DCU 2021

STAND 28

Title of Project: Self-Stand Chair, a Device to Help Standing up from a Sitting Position for the Elderly

Students: Evan Wynne

School: Sutton Park School, St Fintan's Road, Sutton, Dublin 13

Teacher Mentoring Project: Joanne Hanratty

ABSTRACT

Have you ever seen someone struggle getting up from their chair? A grandparent maybe? Getting up from a sitting position can be difficult for people of old age, especially those suffering with arthritis and joint pain. As people grow older, they spend more time at home sitting. Getting up to answer the door or going to the bathroom or whatever one might stand up to do in their day is something that shouldn't cause you pain. But arthritis says otherwise. A study in the journal Arthritis & Rheumatism found that nearly two-thirds of women aged 50 and over experienced persistent, incident, or intermittent knee pain. This shows that a solution to this widespread problem is required. Hence, I put my own twist on the typical living room armchair, entitled a "Self-Stand Chair."

This chair assists the standing motion. As part of the design, the seat contains a "Tilt Mechanism" that lifts a person's hips upwards when they wish to get up from a sitting position. I designed and constructed a 3D model of the chair and its tilt mechanism using CAD software.

I have previously shown in an investigation that knee angles are important in the sit to stand motion. For this competition, I wanted to ensure that my design was functional, so I built a model of the tilt mechanism and completed an investigation to compare the force applied to the ground when a person standing up assisted by the tilt mechanism, versus standing up unassisted.

SciFest@NorthWest

STAND 29

HSO - Helping Sensory Overloads

Student: Bronagh Dempster, Daniel Montgomery, Liam Young

School: St Louis Grammar School, Ballymena BT43 5DW, Co. Antrim

Teacher Mentoring Project: Patrick Trainor

ABSTRACT

HSO – Helping Sensory Overload is an app and puck that is used to try and reduce the insecurity of those who have ASD or sensory issues.

In 2019, we had created an app to help show where building sites were so people were less likely to damage their hearing. This app has developed into what it is today through research and development. The puck was developed in late 2020.

Our app HSO, monitors the ambient sound level and alerts the user/ carer of when the decibel level is above the level that you can tolerate. There is an added geotagging feature which will allow is to show where the noisiest areas are e.g in a school, a certain classroom or room could be way too loud.

The HSO puck, which is a small device in a similar style to an Amazon Alexa, works the same as the app but it has more accuracy. The puck can sit in a classroom setting, undisturbed by any pockets, and alerts the user that is linked to the puck to remove the person who is likely to suffer from sensory issues or find a way to quiet the room down.

One of our main purposes is to try and improve the life of at least one person even in a small way. Due to feedback from others with our working prototype, it is clear to see that our app and puck will be successful, and we will achieve our purpose.

SciFest@GMIT 2021

STAND 30

Title of Project: Interstitial Investigations - An investigation into the Lag Times between Blood and Interstitial Fluid when using Continuous/Flash Glucose Monitors

Student: Anna Cooper

School: Presentation College, Headford, Co. Galway

Teacher Mentoring Project: John Toner

ABSTRACT

The focus of my project is to investigate the lag time between a finger prick test and the readings from continuous and flash glucose monitors used by people with type 1 diabetes.

CGM/FGM are devices that take glucose readings from the interstitial fluid rather than directly from the blood, so there is a lag time between them. I investigated this lag time and its significance when glucose levels are stable vs. changing quickly. Blood sugar levels were tested throughout the day, along with taking the CGM/FGM reading at that time. There were eight subjects who followed this method and then sent the data to me to be analysed. The first set of data was collected when glucose levels were stable and the second set when glucose levels were changing more rapidly. The CGM/FGM readings were compared to a finger prick test, which was the control in all cases.

I found this lag time to be a potential problem for people with T1D, especially when glucose levels are changing rapidly. I also found that the features in some of the sensors and the user's mentality towards the data they receive is key to better and safer management. I created a packet-based protocol that could be used in future pumps and CGMs allowing them to work together as a closed-loop system. If all future pumps and CGMs were compliant with this protocol, it would mean that all pumps and CGMs could be integrated, leading to better blood glucose control.

SciFest@TU Dublin Grangegorman 2021

STAND 31

Title of Project: The Effects of Temperature on a Hydrogel-based Drug-Delivery System

Student: Anna Smyth

School: St Andrew's College, Booterstown Ave, Blackrock, Co. Dublin

Teacher Mentoring Project: Emma Buckley

ABSTRACT

Hydrogels are polymers composed of many individual monomers. They are hydrophilic and can absorb other substances. Temperature is a key variable in drug transmission using hydrogels. Natural polymers that can be used as hydrogels in drug transfer naturally release their contents or dissolve as a result of stimuli such as temperature. I chose to test the effect that temperature had on drug release from hydrogels because a thorough understanding of how heat affects hydrogels as a drug-delivery system is necessary for their effective use.

I used gelatin as my model hydrogel and food dye as my model drug. I put test-tubes with a gel sample and a liquid into water baths of three different temperatures. I used the enzyme bromelain in solution to mimic the enzymes in the human body. I used a spectrophotometer to analyse the amount of food dye that was released from each sample of gel.

My hypothesis was that the most effective temperature would be 36°C as that is the temperature at which the enzyme action would be the most effective. The values in the results varied, but my hypothesis proved true. The lower temperature released much less dye than the higher temperatures. The test-tubes that contained the enzyme also released much more dye than the controls. The absorbance values fluctuated in the higher temperatures. I concluded that the irregularities were as a result of the protein in the gelatin or the enzyme denaturing at the higher temperatures.

SciFest@GMIT 2021

STAND 32

Title of Project: Sepsis Alert

Students: Aoibheann Mangan

School: Mount Saint Michael, Convent of Mercy, Claremorris, Co. Mayo

Teacher Mentoring Project: Paula Campbell

ABSTRACT

Sepsis is a potentially life-threatening condition caused by the body's response to infection and is a serious systemic infection that can quickly lead to circulatory shock, organ failure and death if not treated. It kills more people around the world each year than many of the top illnesses, including cancer and heart disease added together. I have conducted two surveys, one of adults and one of people my own age to deduce what people already know about sepsis, and what the most important things they need to know are. A majority of people I surveyed, said they knew what sepsis was, but did not know the symptoms, whether or not it can be treated at home and how deadly it is.

It is my hypothesis that sepsis is a silent and deadly killer that not enough people are aware of and that through education and close monitoring, people would know how to recognise signs and symptoms and seek early treatment meaning lives could be saved.

My project Sepsis Connect is an app to help educate people on what sepsis is, the signs and symptoms of sepsis and also somewhere for them to log in the symptoms they may be experiencing and a temperature and heart rate log for them to show their doctors to help them diagnose them faster because, with sepsis, time is of the essence, and it doesn't take long for someone to die from it.

SciFest@ TUS Limerick
STAND 33

Title of Project: A Comparative Investigation into the Efficacy of Honey-based Wound Dressings to Synthetic Wound Dressings when Dealing with Infected Wounds

Student: Emma McAndrew

School: Laurel Hill Secondary School, FCJ, Laurel Hill, South Circular Road, Limerick

Teacher Mentoring Project: Karen Kinnerk

ABSTRACT

The desired outcome of this comparative investigation is to: Compare the antimicrobial efficiency of six honey-based wound dressings to two synthetic wound dressings when dealing with infected wounds.

The synthetic wound dressings were in the form of isdine (Inadine), and silver (Acticoat Flex 3 Antimicrobial Barrier Dressing with Silcryst Nanocrystals). I then created three more natural honey wound dressings based off the composition of a manuka wound dressing (Actilite).

It will highlight the views of the public as well as healthcare professionals regarding their use of either. To do this, I conducted rigorous primary research. My experimental methods were: interviews, questionnaires, and experiments. Surveys questioned why one would use either medication, and the factors that influence. The overall preference is synthetic medication, as ruled by 81.5% of the public. The data I obtained from the questionnaire highlights that the majority of healthcare professionals favour and recommend synthetic medication, due to the extensive scientific data and research supporting its safety, listed by the Food and Drug Administration.

The conclusions drawn from interviews with numerous healthcare professionals are that most respondents trust in the effectiveness of synthetic medication. Yet, they would be willing to trial natural medication once extensive research has been conducted. Secondary sourced data from the University of Leeds, hints that manuka honey dressings are effective for bacteria found in agar plates. This has led me to conclude that honey-based wound dressings are highly effective and are strong competitors against the more conventional wound healing treatments.

SciFest 2021 Award Winners

SciFest STEM Champion 2021

Student	Clare Reidy
School	Our Lady's Bower, Retreat Rd., Athlone, Co. Westmeath
Project	Cosmic Radiation Protection Simulation
Teacher	Julie-Anne Greaney

Teacher of Excellence 2021 Award

School	Our Lady's Bower, Retreat Rd., Athlone, Co. Westmeath
Teacher	Julie-Anne Greaney

SciFest STEM Champion 2021 Runner-Up Award

Student	Caoimhe Walsh
School	St Brogan's College, Kilbrogan, Bandon, Co. Cork
Project	CAN-TEENS Make Better Food Choices?
Teacher	Karen Corbett

Berlin Long Night of Science Award 2021

Students	Niamh Carolan, Líle Hensey
School	Ursuline College Sligo, Finisklin, Sligo
Project	Keep a Clear Head – An Investigation into the Observed Physiological Brainwave Effects, when present within Interfering Domestic Electromagnetic Fields
Teacher	Anthony Carolan

Boston Scientific Medical Devices Grand Award 2021

Students	Anna Smyth
School	St Andrew's College, Booterstown Ave, Blackrock, Co. Dublin
Project	The Effects of Temperature on a Hydrogel-based Drug-Delivery System
Teacher	Emma Buckley

Boston Scientific Medical Devices Runner-up Award 2021

Student	Evan Wynne
School	Sutton Park School, St Fintan's Road, Sutton, Dublin 13
Project	Self-Stand Chair, a Device to Help Standing up from a Sitting Position for the Elderly
Teacher	Joanne Hanratty

Intel Technology Award 2021

Student	Hari Pranavam
School	St Eunan's College, Letterkenny, Co. Donegal
Project	Building an Automatic Weather Satellite Ground Station with Data Analytics
Teacher	Michael Harkin

SciFest STEM Outreach Award 2021

Student	Anna Cooper
School	Presentation College, Headford, Co. Galway
Project	Interstitial Investigations - An investigation into the Lag Times between Blood and Interstitial Fluid when using Continuous/Flash Glucose Monitors
Teacher	John Toner

SciFest Social Sciences Award 2021

Student	Katie Harlow
School	Meánscoil Muire gan Smál, Convent of Mercy, Roscommon Town
Project	'It's the Small Things' – An Investigation into the Division of Emotional Labour in the Home and Suggestions on how any Gender Imbalances can be Rectified
Teacher	James McLoughlin

SciFest Life Sciences Award 2021

Student	Ethan Kirwan, Jack Kelly
School	Desmond College, Station Road, Newcastle West, Co. Limerick
Project	Using Magnets to Help Prevent Heart Attacks
Teacher	Donal Enright

THEA Award 2021

Student	Maeve Stillman
School	St Mary's College, 35 Northland Road, Londonderry
Project	Investigating the Effectiveness of Various Face Masks Against COVID -19 Virus and Aerosol Droplets
Teacher	Ann Blanking MBE

ISTA Award 2021

Student	Caleb Kiely, Binh Hanratty
School	Coláiste Dún an Rí, Kingscourt, Co. Cavan
Project	A Statistical Analysis of Young People's Awareness and Attitudes to COVID-19 in Ireland
Teacher	Robert Lorenz

SciFest Scientist of the Future Award 2021

Student	Lucy Teape, Kate Lehane
School	St Brogan's College, Kilbrogan, Bandon, Co. Cork
Project	Keep Calm and Carry On Breastfeeding
Teacher	Laura O'Regan

American Psychological Association Award 2021/2022

Student	Katie Harlow
School	Meánscoil Muire gan Smál, Convent of Mercy, Roscommon Town
Project	'It's the Small Things' – An Investigation into the Division of Emotional Labour in the Home and Suggestions on how any Gender Imbalances can be Rectified
Teacher	James McLoughlin

American Meteorological Society Award 2021/2022

Student	Hari Pranavam
School	St Eunan's College, Letterkenny, Co. Donegal
Project	Building an Automatic Weather Satellite Ground Station with Data Analytics
Teacher	Michael Harkin

ASM Materials Education Foundation Award

Student	Maeve Stillman
School	St Mary's College, 35 Northland Road, Londonderry
Project	Investigating the Effectiveness of Various Face Masks Against COVID -19 Virus and Aerosol Droplets
Teacher	Ann Blanking MBE