MCAST RESEARCH & INNOVATION EXPO 22

The 4th MCAST Research & Innovation Expo

15th–16th December 2022

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MCAST RESEARCH & INNOVATION EXPO 22

FOREWORD

MCAST

MESSAGE FROM THE PRINCIPAL

Professor Joachim James Calleja
Principal and CEO of MCAST

The fourth edition of the MCAST Research and Innovation EXPO sheds light on our college commitment to research, which is now a hallmark of MCAST's achievements in the implementation of its strategic targets. This EXPO is an excellent opportunity to appreciate the research done by our growing research community across all Institutes. Sharing this research has a twofold aim: to acknowledge the success of MCAST researchers, and to inspire future potential researchers at our college. I note with great approbation the effort made to promote and include gradually all our six Institutes in the realm of research in various sectors of our vocational education and training curricula.

MCAST lecturers are now aware of the overarching significance of the research. Their contribution manifests their firm commitment to it. Their engagement resulted in many research bids while introducing innovative concepts in this sector. Additionally, the continued publication of the Journal of Applied Research and Practice enhances the communication of valuable research among our MCAST community and further beyond. This Journal is a unique platform at MCAST for researchers to publish their findings. It also facilitates its readership in a most professional manner. It encourages lecturers to undertake research in areas that meet the MCAST mission statement. In the end, this proliferation of MCAST research carried out in the ambiance of true-to-life vocational education serves our local and foreign communities to assimilate and utilise this research for their own welfare and the well-being of their societies. Moreover, such research supports business and the economy, while it is the noblest medium for sharing of knowledge and creating the right environment for individual and social progress.

Over the years, MCAST has become the first choice for a growing number of students, including adult learners. The new academic year has seen an increase in enrolment of 8% over the previous year. In the sector of vocational education and training, research is a need and an ideal to be further developed. The extension of the MCAST curricula to Level 8 results from the employment requirements of its student cohorts and the direction strongly suggested by the world of employment

itself. The research carried out at MCAST could embellish the business developments in liaison with the sectors of industry and economy. The EU funding for research should continue to encourage our lecturers to embark on research projects both for their own professional development as well as for the reasons I have already referred to above. It is important to note that in its recent developments, MCAST has allocated a better-structured support system to encourage and sustain its research teams. Research also marks and celebrates a unique feature at MCAST: our college now covers all the levels specified in the Malta Qualifications Framework.

The decisions taken regarding research bind us to seek further curricular improvement at all levels so that the journey leading to this important milestone is academically sound and safe for all its participants. What is achieved so far paves the way to the transformation of our knowledge, skills, and abilities into research projects that could only make our life and that of others much better. Research offers us the opportunity to make the world a better place to live in. the UN Sustainable Development Goals continue to guide our research activities in no small measure.

I augur that the Research and Innovation EXPO 2022 is an excellent starting point for further research consolidation and an invitation to carry forward the development of applied research and sustainable innovation across our Institutes. The ultimate purpose of MCAST activities in the field of research is to increase substantially the well-being of our society and all its members.

THE ARIC R&I EXPO ORGANIZING COMMITTEE

Dr Tatjana Chircop
MCAST Deputy Principal for Research & Innovation
Applied Research & Innovation Center (ARIC)

Dr Tatjana Chircop is the Deputy Principal for Research and Innovation at MCAST. Her main areas of expertise are youth and community studies, vocational education (VET) and performing arts. Leading a team of researchers at the college, she has worked on researching challenges that students find in their educational journeys as well as innovative pedagogical tools which enhance learning, such as gamification. She has also lead the initiative to introduce the role of student mentors at MCAST and has been leading the team for the past 4 years.

In her role as Deputy Principal for Research and Innovation, she leads the Applied Research and Innovation Centre (ARIC), the Library and the Centre for Professional Development teams. Within ARIC, a number of master's programmes are delivered, including the Master in Research Methods and the Master by Research, as well as the professional Doctorate programme which is being run for the 2nd consecutive year. Over the years, she has consistently been involved in teacher training at MCAST, most recently through the implementation of the innovative Master's degree in Vocational Education Applied Research 4.0, which was run under the Centre for Professional Development.

Prior to joining MCAST, Dr Chircop was a professional musician with the Manoel Theatre Orchestra and the National Orchestra and taught violin and pianoforte performance at the Johann Strauss School of Music. Subsequent roles included those of learning support assistant and community development worker. Within MCAST, Dr Chircop was a lecturer and later a Director of the Institute of Community Services, Head of the Foundation College and Deputy Principal for Arts and Social Sciences.

Dr Chircop graduated with a BA Hons in English (University of London), a BA Hons in Youth and Community Studies (University of Malta), a MA in Youth and Community Studies (Brunel University), a Master in Intercultural Eco-Management (Universita' Ca Foscari), a Post-Graduate Certificate in Vocational and Educational and Training (MCAST) and a PhD (Brunel University).

Dr Lorna Bonnici West

MCAST Acting Director for Research and Innovation
Applied Research & Innovation Center (ARIC)

Dr Lorna Bonnici West is the Acting Director of Research & Innovation at MCAST, instigating scientific research excellence initiatives across the organisation, in collaboration with a group of highly professional and proficient colleagues at ARIC. Dr Bonnici West, together with the ARIC colleagues, has been instrumental in steering research groups and themes, drive and support the adoption of research initiatives by institute academic staff and has been highly active in supporting research teams in the writing of research proposals for different funds.

Prior to her engagement at MCAST, Lorna worked as a principal clinical pharmacist at Mater Dei Hospital. Since January 2020 she joined MCAST as a Senior Research Officer supporting the Institute of Applied Sciences. Dr Bonnici West also holds a post of Visiting Senior Lecturer with the Department of Clinical Pharmacology and Therapeutics, University of Malta.

Dr Bonnici West graduated in Pharmacy from the University of Malta in 2000. She read for a Master of Science degree in Clinical Pharmacy at the Robert Gordon University, Scotland, graduating in 2006, and was awarded a scholarship by the Malta Government Scholarship Scheme to read for a PhD at the Robert Gordon University, Scotland, graduating in 2015. In 2016, she was awarded a post-doctoral grant under the Reach-High Scholars Programme Scheme, part-financed by the European Union, European Social Fund.

LLM Gonca Kara
MCAST Senior Research Officer
Applied Research & Innovation Center (ARIC)

Ms Gonca Kara Demir has studied Law and holds an LLM degree from the University of Sussex with vast experience and knowledge in EU focused ICT and Intellectual Property Rights Law as well as R&I management within IT Industry. As an R&I manager, she has over 10 years of experience working on EU and National Funding Programmes in particular related to ICT, Smart Cities, Environment, and Digital Skills where she actively uses as part of her role as a Senior Research Officer at the IICT. Her expertise includes project & programme management and dissemination in EU funding programs such as Horizon Europe, European Institute of Innovation &Technology (EIT), EUREKA, MarTeRA, Innovation Grants and Acceleration programs for Startups. Currently, actively collaborates with the ICTAR research team of IICT and works on internalization of the research at IICT.

Dr Christine Zerafa
MCAST Senior Research Officer
Applied Research & Innovation Center (ARIC)

Dr Christine Zerafa's experience as a concert pianist, music educator and artistic researcher highly influences her role as Senior Research Officer within the Institute for the Creative Arts. The ICA has been flourishing with a number of diverse research projects that span from pedagogical, artistic and theoretical research, and Christine has been instrumental in supporting the contrasting methodologies and research approaches taken by researchers at this institute. A recent Master's and PhD graduate from the Royal Academy of Music, London, Christine has also been highly active as an international performer and as a vocal/instrumental coach, while also proactively publishing and disseminating her research. She is passionate about giving a voice to artistic practice as a research output, something which is also clearly emerging in research projects carried out by researchers within the ICA.

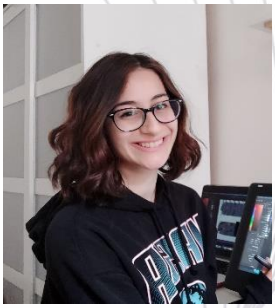
Dr Sarah Camilleri
MCAST Senior Research Officer
Applied Research & Innovation Center (ARIC)

Dr Sarah Camilleri is one of the most recent members to join the Applied Research and Innovation Centre (ARIC) earlier in 2022. Her experience is research was mostly earned between 2008 and 2015, through master's and doctoral programs in Water, Marine and Coastal Management at the University of Cadiz (Spain) and the University of Bologna (Italy); exploring themes including fisheries management, wetland management, spatial analysis and remote sensing applications amongst others. In 2016 she took up the role of environmental officer within the local public sector, working in the implementation of international/EU/national policy linked to the protection of the marine and water environment and resources. Sarah's involvement at MCAST started in 2020 with the supervision of MSc students at the Institute of Applied Science, and later as researcher within agriculture related projects. Through her new role as Senior Research Officer, Sarah works to support the Institute of Business, Management and Commerce in its research and innovation endeavours. Further she participates in the development of PRIMA and Horizon funded projects supporting innovation initiatives within the agricultural field.

Dr Massimo Pierucci
MCAST Senior Research Officer
Applied Research & Innovation Center (ARIC)

Dr Massimo Pierucci holds a degree in Biological Sciences and more than fifteen years of research experience in the field of neuropharmacology and neurophysiology. During this period, he had the opportunity to supervise and co-supervise undergraduate, master and PhD students, offering both experimental and theoretical guidance, and to gain lecturing experience teaching biological subjects at the Department of Psychology of the University of Malta. This experience has enabled Massimo to promote, support and structure research endeavours through the Institute of Community Services, fulfilling his role of Senior Research Officer. The Institute has

recently seen an uptake of different research activities, with projects spanning from sport , social and education research and taking into consideration the vocational education mission of the Institute.



Ms Lisa Theuma
MCAST Researcher
Applied Research & Innovation Center (ARIC)

Ms Lisa Theuma, with a passion for learning and exploration, has consistently involved herself in investigating the various fields within the vast world of game art and design throughout her education and aspires to cultivate her knowledge through her work. After recently acquiring her Bachelor's degree in Game Art & Visual Design from MCAST's Institute for the Creative Arts, Lisa set her sights on strengthening her skills and building innovative learning experiences, thus taking on the role of Ed-Tech Researcher. Lisa aims to apply her creativity to future research projects and support their development within the Applied Research & Innovation Centre, ultimately providing entertaining and educational experiences for others.

Mr Geoffrey Attard
MCAST Researcher
Applied Research & Innovation Center (ARIC)

Mr Geoffrey Attard recently joined the ARIC Department at MCAST. He has completed his Master's by research in 2020, where he developed an innovative EdTech toolkit called TangiBoard. He studied at Middlesex University where he also graduated in a Computer Science Degree with first-class Honours. He was involved in various projects ranging from software/web development, mobile app/game development, electrical/electronics, robotics, networking, artificial intelligence, computer vision, mechanical engineering and educational technologies. Coming from a military

background, he always works with a mindset that giving up is never an option, there is always a way.

Ms Maria Ragia
MCAST EIT-Hub Researcher
Applied Research & Innovation Center (ARIC)

As a political science and International relations graduate, with a special interest in human rights and peace building, Maria finds herself motivated in working in the field of human rights and social development. She has experience in working on social inclusion through EU funds and therefore has a basic knowledge of project management. She is always eager to expand her knowledge and highly values continuous education and learning.

Ms Pelin Uner
MCAST EIT-Hub Researcher
Applied Research & Innovation Center (ARIC)

Pelin Uner currently works as EIT Hub Researcher at Applied Research and Innovation Centre at MCAST, coordinating the projects under the umbrella of the EIT Climate-KIC and EIT Urban Mobility Hubs, in which MCAST is a partner. Her field of study in the university was Business Administration BSc. Pelin Uner started her career journey in 2012 in Budapest, Hungary working on EU projects of social subjects. She later on moved to Athens, Greece and worked for global corporations. In 2016, she started working in Malta as Business Development Executive in a law office, mainly on foreign direct investment projects. Since she has joined the ARIC team in April 2022, she continues her work on several education, entrepreneurship and community building projects and programmes which focus on sustainable urban mobility and addressing climate change.

Ms Uyen Vu
MCAST EIT-Hub Researcher
Applied Research & Innovation Center (ARIC)

Uyen Vu is currently an EIT Hub Researcher at the Malta College of Arts, Science and Technologies (MCAST). She is in charge of EIT Food project management and communications support for all EIT projects under MCAST. She has 2 years' experience in EU project management in Malta, 3 years' experience in communications for World Health Organization in Viet Nam and another 4 years governance experience in the private sector. She graduated a master's study in International Development at Nottingham Trent University in the UK in 2016. Her first degree (BA) is in International Relations issued by National University, Social Science and Humanities Ho Chi Minh City, Viet Nam.

Ms Rozela Franco
MCAST EIT-Hub Researcher
Applied Research & Innovation Center (ARIC)

Rozela Franco is a curious and passionate researcher with a recent master's degree in Sustainability in Fashion and Creative Industries. She has joined MCAST Applied Research and Innovation Centre team as an EIT Hub Researcher to pursue opportunities that will allow her to contribute to environmental and social change. Throughout her academic career, she developed vital interests in furthering the conversation on how fashion can be more sustainable, specifically on how to revive traditional sustainable craftsmanship in fashion through digitalization. Rozela has worked extensively with various companies, NGOs and sustainable start-ups in Dubai, Berlin, Argentina, Romania, Laos and India over the past six years in sectors such as retail, fashion, arts, design, jewellery, gaming, events. As an adaptable professional, she is prepared to make innovative contributions that can help identify novel solutions to global problems.

PROGRAMME HIGHLIGHTS

Thursday 15th December 2022:

8:30 – 9:00	***Welcome Coffee***
9:00 – 9:15	***Opening Ceremony*** ***Dr Lorna Bonnici West*** *Acting Director of Research & Innovation (MCAST)* ***Dr Tatjana Chircop*** *Deputy Principal of Research & Innovation (MCAST)* ***Prof Joachim James Calleja*** *Principal and CEO (MCAST)*
9:15 – 10:15	***Session 1 – Overview of Research within Institutes/Centres at MCAST***
	Institute and other Centre Directors will give an overview presentation of research activity with the respective institutes and centres.
10:15 – 10:30	*Coffee Break*
10:30 – 11:15	***Session 2 – Panel Discussion***
	Panel Discussion between Institute Directors and other Centre leaders. *Theme/s: Enhancing inter-institute and industrial collaboration, enhancing innovation and entrepreneurship, and reaching out to the public through MCAST research.*
11:15 – 12:45	***Session 3 – Presentations***
	Researchers present ongoing and completed projects, with particular focus on the impact of research.
12:45 – 13:30	*Lunch Break*
13:30 – 16:00	***Session 4 - Presentations***
	Researchers present ongoing and completed projects, with particular focus on the impact of research.
16:00 – 17:00	***Research Networking Afternoon Tea***

Friday 16th December 2022:

8:30 – 9:00	***Welcome Coffee***
9:00 – 10:30	***Session 1 - Presentations***
	Researchers present ongoing and completed projects, with particular focus on the impact of research.
10:30 – 10:45	*Coffee Break*
10:45 – 12:45	***Session 2 – Presentations***
	Researchers present ongoing and completed projects, with particular focus on the impact of research.
12:45 – 13:30	*Lunch Break*
13:30 – 16:00	***Session 3 –Presentations***
	Researchers present ongoing and completed projects, with particular focus on the impact of research.
16:00	***Closure***

PROGRAMME OUTLINE – DAY 1

THURSDAY 15TH DECEMBER

ROOM: AUDITORIUM – MRC BUILDING

8:30 – 9:00	***WELCOME COFFEE***
9:00 – 9:15	***OPENING CEREMONY*** ***Dr Lorna Bonnici West*** *Acting Director of Research & Innovation (MCAST)* ***Dr Tatjana Chircop*** *Deputy Principal of Research & Innovation (MCAST)* ***Prof Joachim James Calleja*** *Principal and CEO (MCAST)*
SESSION 1 ***9:15 – 10:15***	***Overview of Research within Institutes/Centres at MCAST*** *Institute Directors will give an overview presentation of research activity taking place, as well as highlighting the various themes and sub-themes in relation to research conducted amongst lecturers and students, the nature of publications, curriculum/module content emerging from the research, and any respective statistics, etc.*
10:15 – 10:30	***Coffee Break***
SESSION 2 ***10:30 – 11:15***	***Panel Discussion*** *Panel Discussion between Institute Directors and other Centre leaders* *Theme/s: Enhancing inter-institute and industrial collaboration, enhancing innovation and entrepreneurship, and reaching out to the public through MCAST research.*
SESSION 3 ***11:15 – 12:45***	***RESEARCH PRESENTATIONS*** *Simone Weil: Performance through nothingness* ***Tyrone Grima*** *Implementing augmented reality technology in teaching human anatomy: An educator's autoethnography* ***Cassandra Sturgeon Delia*** *Implementation of the Young Innovators Programme* ***Sandra Mary Portelli*** *Valorization of olive pomace* ***Frederick Lia, Karen Attard, Stephanie Ghio, Mecit Halil Oztop*** *A semantic real-time activity recognition system for sequential procedures in vocational learning* ***Daren Scerri*** *Malta Food Citizen Lab - Increasing trust in local produce and food safety, co-funded by EIT Food* ***Uyen Vu Thi Phuong; Gonca Kara***
	IMPACT: Visualising the microplastic problem ***Juan Jose' Bonello; Frederick Lia; Oriane Georges; Marina Beltri; Manya Russo; Andrew Schembri***

12:45 – 13:30	***LUNCH BREAK***
SESSION 4	***RESEARCH PRESENTATIONS***
13:30 – 16:00	*Experiment design of a payload for a sub-orbital rocket to study spacecraft repair after space debris impacts* ***Leonardo Barilaro*** *The* Mental *Health Needs of 16 to 18 year old Students in Level 1 to 3 Vocational Education in Malta* ***Claire Abela*** *Forecasting Dust Storms over the Mediterrean Sea* ***Joseph A Zammit*** *AMBULANT: AutonoMous Bio-mimetic Underwater vehicle for digitAI cage monitoring* ***Owen Sacco; Massimo Pierucci; Lorna Bonnici West; Jeremy Scerri; Conrad Vassallo; David Degura; Gonca Kara; Clive Seguna*** *The Perception of PE Secondary School Teachers about the role of PE in promoting Mental Health and Wellbeing* ***Anna Maria Gatt; Kyriaki Makopoulou*** *Recognition of Underutilised Maltese Marine Species* ***Kimberly Terribile; Juan Jose Bonello; Daren Scerri; Frankie Inguanez*** *Remote learning and examination based on augmented reality (concept)* ***David Deguara; Aaron M Acevedo-Reveron; Christian Camilleri; Clifford De-Raffaele; Edwin Zammit; Jan Smallegange; Adrian Butnaru; Carlos E. Mora*** *Undergraduate Nursing Education - Well-Being Support Throughout the Clinical Placement* ***Jonathan Vella*** *Creating a deeper and practical collaboration with Malta's National TV Broadcaster* ***Ian Attard*** *Intelligent Tools for Crops* ***Steve Zerafa*** *Fenek - Spearheading Wild Rabbit Research in Malta* ***Ian Falzon*** *Electronic and mobile government services in Europe: The state of play and policy recommendations* ***Adriana Camilleri; Mark Anthony Camilleri***
16:00 – 17:00	***RESEARCH NETWORKING AFTERNOON TEA***

PROGRAMME OUTLINE – DAY 2

FRIDAY 16TH DECEMBER

ROOM: AUDITORIUM – MRC BUILDING

8:30 – 9:00	***WELCOME COFFEE***
SESSION 1	***RESEARCH PRESENTATIONS***
9:00 – 10:30	*How students understand the Chaplaincy's proposal: A narrative inquiry* ***David Callaby Floridia***
	An autobiographic graphic novel incorporating photography as a pedagogic tool for the teaching of morals and ethics in photojournalism ***Simon Callus; Gary Hampton***
	Projects, Initiatives, and the Future of Cyber Security at MCAST ***Robert Abela***
	COVID-19 diagnosis as a teachable moment for smoking cessation: a randomised controlled feasibility study ***Joseph Grech***
	ECOdesign4EU: New training contents and joint VET qualifications on Ecodesign for Creative and Cultural Industries ***Owen Sacco***
	Networking for Excellence in Electric Mobility Operations ***Brian Azzopardi; Vibhu Jately; Marcin Pincynski; Somesh Bhattacharya; Renata Sadula; Steve Zerafa***
	Water Efficiency through Site Research & Simulation ***Alex Rizzo***
10:30 – 10:45	***Coffee Break***
SESSION 2	***RESEARCH PRESENTATIONS***
10:45 – 12:45	*Training in aquaculture: an international dimension* ***Kimberly Terribile***
	A multidisciplinary approach in completing a dissertation for Creative Media Production ***Ian Attard; Simon Callus; Natalino Fenech; Ivan De Battista***
	Nutritive values of forage plants with chemical and microbiological results on silage composition and determination level of desirable and undesirable substances in silage ***Ramona Cristina Cotruț; Malcom Borg; Marco Dimech; Giusseppe De Mastro; Franco Santoro***
	Gigging-4-Living: Supporting creative solutions to sustain artists working in the gig economy ***Christine Zerafa; Christine Vella; Moritz Zavan Stoeckle***

	MED-WET - Sustainable Water Irrigation ***Malcolm Borg; Sarah Camilleri; Francesca Busuttil; Lorna Bonnici West*** *An Investigation of the Antiviral Activity of Mediterranean herbs and spices against SARS-CoV-2* ***Jean-Pierre Brincat; Frederick Lia; Karen Attard; Stephanie Ghio; Yüksel Çetin*** *Successes of Joint Universal activities for Mediterranean PV integration Excellence (JUMP2Excel)* ***Brian Azzopardi; Vibhu Jately; Marcin Pincynski; Somesh Bhattacharya; Renata Sadula; Steve Zerafa*** *Monitoring Children's Approach towards learning outdoors in a Sustainable and Natural Environment* ***Simone Restall***
12:45 – 13:30	***Lunch Break***
SESSION 3	***RESEARCH PRESENTATIONS***
13:30 – 16:00	*Modernisation of Agriculture through more efficient and effective Agricultural Knowledge and Information Systems* ***Sarah Camilleri; Lorna Bonnici West*** *An Overview of the Fun Fit 5 (FF5) Research Project* ***Melanie Darmanin; Renzo Kerr-Cumbo; Matthew Muscat Inglott; Heathcliff Schembri*** *Higher Education Innovation Growth and Training: heightening sustainable innovation in our HEIs and societies* ***Maria Ragia*** *Experiences in the development of an integrated simulation and assessment application for healthcare professionals (the iSADD project)* ***Neville Schembri; Daren Scerri; Gerard Said Pullicino; Lorna Bonnici West; Phyllis Farrugia Abanifi; Jonathan Vella*** *Love and Hate in Maltese Media: Affective Polarization* ***Rosemarie Calleja*** *Transforming Advanced Water Skilling Through the Creation of a Network of Extended-Reality Water Emulative Centres* ***Edwin Zammit; Lorna Bonnici West; Edel Cassar; Owen Saco; Geoffrey Attard; Alex Rizzo; Chris Camilleri; Lisa Theuma; Gonca Kara*** *Spatial dynamics in Sartre's Huis Clos: how imperative is space in otherness?* ***Tyrone Grima*** *Mediterranean Island Cleantech Innovation Ecosystem* ***Gonca Kara*** *Interactions between bottlenose dolphins and small-scale fisheries in Malta* ***Kimberly Terribile; Matthew Laspina*** *Land User Land Cover Mapping of the Maltese Islands* ***Daren Scerri; Frankie Inguanez; Juan Jose Bonello*** *Digitalization of public services: case studies* ***Eleni Tsitsirigou***
16:00	***CLOSURE***

MCAST RESEARCH & INNOVATION EXPO 22

A SELECTION OF ONGOING EXTERNALLY FUNDED PROJECTS

MCAST

Valorization of olive pomace

Frederick Lia[1], Karen Attard[1], Stephanie Ghio[1], Mecit Halil Oztop[2]

[1]*MCAST Institute of Applied Sciences*
[2]*Middle East Technical University*

BACKGROUND

Olive oil is the most important food item of Mediterranean Diet. Major olive oil production takes place in Mediterranean countries. During the production of olive oil, significant amount of waste is generated in the form of pomace and waste water depending on the production method. In this project, we will focus on the valorization of olive pomace for the purpose of production bioactives and nanocrystalline cellulose. Olive Pomace will be used to produce functional ingredients showing 'antioxidant, anticancer' activity and also nanocrystalline cellulose that can be used as an anticaking agent. Pomace bioactives will be extracted via various 'green' technologies (supercritical fluid and ultrasound) and will be encapsulated afterwards to produce liposomes to increase their bioavailability. A comprehensive analysis on the nutraceutical properties of the extracts and capsules will be performed. At the same time the remnants left from extraction will be utilized to produce nanocrystalline cellulose which would be proposed as an anticaking agent. High pressure homogenization and ultrasonication will be applied at that stage. To our knowledge there is a not previous research that considered all these aspects for olive pomace valorization at the same time with the proposed technologies.

OVERALL AIM

OPoBiCell is a waste valorization project that aims to utilize the olive pomace to produce value added products for food industry. Olive oil, the most prominent food of the Mediterranean Diet generates significant amount of pomace and waste water. OpoBiCell will focus on the pomace generated by the production a very special variety of olive grown Southwest Anatolia and perform extraction of the bioactives to produce functional food additives and will also use the remaining biomass to obtain another value-added product; nanocrystalline cellulose (NCC). NCC will be tested as an anticaking agent for powder foods.

MAIN EXPECTED OUTCOME/S

The aim of OPoBiCell is to utilize the olive pomace generated from olive oil processing with maximum efficiency to produce bioactives by using different extraction methods and to utilize the remaining pulpy biomass to produce nanocrystalline cellulose as an anticaking agent. Under this scope, the specific objectives of the project are listed as:

1. To use different extraction methods (supercritical fluid; and ultrasound) for the recovery of bioactive constituents from olive pomace and make a comparison based on antioxidant activity; yield and phenolics content.
2. To perform physicochemical characterization of the olive mill waste extracts using a profiling-based approach for the quantification of the major bioactive classes present in the extracts.
3. To determine the bioactive potential of the extracts against the human and mammalian cancer cell lines and there effect on the cell cycle.
4. To encapsulate various fractions and crude extracts and test the delivery of these compounds on a cellular level.
5. To make an assessment and quantification of Nuclear Factor kappa transcription factor, tumour suppressor p53 protein and apoptosis regulator BAX protein and caspase-3.

RESULTS

The olive pomace samples were collected at different stages of maturity and were investigated for their phenolic content and antioxidant activity. Three different extraction procedures were employed including in methanolic maceration extraction and two hydrolysed procedures using 6M HCL for acid hydrolysis and 10M NaOH for alkaline hydrolysis. The total phenolic, flavonoid and ortho-diphenolic content, metal ion reducing activity, 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid and 2,2-Diphenyl-1-picrylhydrazyl radical scavenging, hydrogen peroxide and superoxide scavenging activity assays were determined for the different extracts. In this study, cultivar and maturation of olives is one of the factors that effected the phenolic content in the olive pomace samples. Results showed that alkaline hydrolysis had the highest antioxidant activity with respect to total phenolic content, 2,2-Diphenyl-1-picrylhydrazyl scavenging activity, metal ion reducing activity and superoxide scavenging activity whereas acid hydrolysis had the highest 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid scavenging activity. The correlation analysis carried out onto the different phenolic classes revealed that the total phenolic, flavonoid and ortho-diphenolic content were correlated with metal ion reducing activity and radical scavenging activity.

IMPACT OF RESEARCH

Olive oil is an indispensable component of the Mediterranean dishes. More than 90% of olive oil is produced in Mediterranean countries and ~82% of table olive is also produced here. Turkey is an important olive and olive oil producer thus significant amount of waste is generated during the production. OpoBiCell will directly be addressing the olive value chain by valorizing olive pomace. OpoBiCell is directly related with the call since the product of interest is strongly associated with Mediterranean countries and will also provide outputs for the Mediterranean agro-

food value chains. Innovative technologies and strategies will be utilized to obtain value added products from olive pomace. Maltese team will focus on a detailed characterization of olive pomace extracts produced by different techniques (conventional solvent, ultrasound, supercritical fluid extraction) from a health perspective whereas METU team will focus more on the production of cellulose nanocrystals from the waste remaining following the extraction of the compounds.

Project OpoBiCell funded by the Malta Council for Science and Technology and the Scientific Technological Research Council of Turkey (TÜBİTAK) through the MCST-TÜBITAK 2021 Joint Call for R&I projects. This initiative is part of the PRIMA Programme supported by the European Union under grant agreement number MCST-TUBITAK-2021-04.

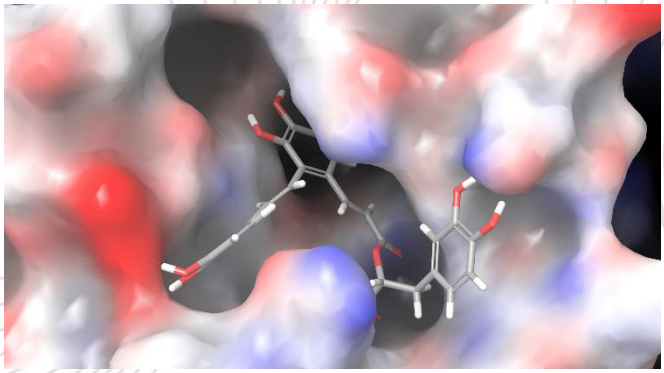
An Investigation of the Antiviral Activity of Mediterranean herbs and spices against SARS-CoV-2

Jean-Pierre Brincat[1], Frederick Lia[1], Karen Attard[1], Stephanie Ghio[1], Yüksel Çetin[2]

[1]MCAST Institute of Applied Sciences
[2]TUBITAK, Marmara Research Center

BACKGROUND

The COVID-19 outbreak caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) predominantly spread all over the world and was responsible for the deaths of millions of people. Effective vaccines have been developed since then, however their method of administration remains invasive. Alternative and simpler solutions are still required in order to combat the spread of the virus.



So far, the search for antiviral small-molecule inhibitors has mostly focused on repurposing existing drugs. However plants, particularly herbs, contain a vast array of chemicals which evolved to defend the plants from pests and pathogens, including viruses. In fact, plants have historically served as the original source of a very large number of important pharmaceutical compounds, most of which are still in use today. Besides, naturally-derived compounds are worthy therapeutic alternatives since they are innately better tolerated by the human body.

Herbal exploration specifically targeted against SARS-CoV-2 has already been performed. Spices and herbs have been extensively studied globally due to their high antioxidant and antimicrobial activity, and their beneficial effects on humans. For self-care during the COVID-19 pandemic, the use of spices such as turmeric, cumin, coriander, garlic and the drinking herbal tea made from basil, cinnamon, black pepper, ginger, and raisin have been recommended once or twice in a day. Now, we propose to confirm whether these commonly used herbs and spices specifically inhibit SARS-CoV-2 or act only as immunity boosters, and to investigate some comparatively understudied Mediterranean herbs.

OVERALL AIM

The aim of this project is to investigate the antiviral activity and immuno-modulatory effects of selected Mediterranean herbs and spices against SARS-CoV-2 infection using in a combination of silico methods, high-throughput screening techniques, and in vitro models. The overall objective is to evaluate the antiviral potential of some of the natural products found in Mediterranean herbs and spices to aid in overcoming the COVID-19 pandemic.

MAIN EXPECTED OUTCOME/S

The discovery of potent SARS-CoV-2 inhibitors within the pool of natural compounds available is not guaranteed. Even so, this study will certainly produce meaningful insights into the antiviral, antioxidant and immunomodulatory effects of Mediterranean herbs and spices. In turn, this will help provide safer and simpler alternatives for the continued management of the COVID-19 pandemic, and promote the Mediterranean diet as a valuable and culturally acceptable dietary pattern.

RESULTS

A number of main targets have been reached so far. Firstly, a list of known natural compounds found in a list of Mediterranean herbs and spices has been compiled. This has been further extended to a full Literature Review, which is being published separately. Secondly, a number of in silico models have been created, targeting specific mechanisms required by SARS-CoV-2 in order to complete its life-cycle. The models have been used to predict which of the compounds from the list of natural products are most likely to exhibit SARS-CoV-2 inhibitory activity. Thirdly, samples of different plants have been collected from around Malta. Hydroalcoholic extracts of these plants have been prepared. Fourthly, the total phenolic content, total flavonoid content, total flavanol content and total ortho-diphenolic content of the extracts have been determined using separate assays. These results provide information on the anti-oxidant activities of the extracts.

IMPACT OF RESEARCH

The scientific impacts of this research include furthering our knowledge of the role which small molecules and natural products can have in the fight against COVID-19 and other viral diseases. Novel natural compounds and previously unknown bioactivities might be discovered. The understanding of the mechanisms through which natural compounds hinder the activity of viruses will also be better understood. The antioxidant and antiviral activities of a number of plant species will be uncovered. This could lead to further studies on the plant extracts and more detailed investigations into the natural products which they contain. The ultimate

impact would be the discovery of alternative, safer and simpler methods for the treatment and prevention of COVID-19.

The social importance of this research include the promotion of the Mediterranean diet as healthy and beneficial. It will also increase our appreciation of Mediterranean plants, particularly herbs and spices, and the positive effects which they can have.

From an economic perspective, this research will allow the interaction with the business community and stakeholders, and will serve to stimulate new partnerships among Mediterranean researchers and innovators. The outcomes of this project will lead to the improvement of Agro-food activities, and healthy food production as well as more sustainable food sources.

From an educational perspective, the research allows for the collaboration between Maltese and Turkish researchers. This sharing of knowledge will expand the expertise of MCAST staff, and allow the on-boarding of new, valid researchers. It will also bring current and future students closer to the state-of-the-art in research into natural compounds.

Project Antiviral-Medherbs funded by the Malta Council for Science and Technology and the Scientific Technological Research Council of Turkey (TÜBİTAK) through the MCST-TÜBITAK 2021 Joint Call for R&I projects. This initiative is part of the PRIMA Programme supported by the European Union under grant agreement number MCST-TUBITAK-2021-01.

AMBULANT: AutonoMous Bio-mimetic Underwater vehicle for digitAI cage moNiToring

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BACKGROUND

Traditional cage aquaculture requires marine biologists to periodically assess the water quality and estimate fish biomass to ensure optimal conditions for the specific marine ecosystem being cultured. This periodical assessment poses considerable risks due to accessibility and safety, while also incurring high costs to perform in-situ measurements and fish biomass estimations.

This two-year project, funded by the Science and Technology Cooperation Sino-Malta Fund, aims to propose an alternative unmanned solution via the development of a hybrid drive biomimetic underwater robotic cage-monitoring system. This robotic system will incorporate state-of-the-art digital technologies to provide reliable underwater 3D positioning and localisation, Spatio-temporal warnings for water quality, fish biomass estimations and benthic identification systems. Additionally, computer vision modelling will be used to support the digitalisation of environmental monitoring in Malta, specifically survey and mapping of benthic habitats. This technology has the potential of reducing the cost of breeding, improve the efficiency of breeding, and realise a safe and sustainable approach for the comprehensive monitoring of deep-sea cages and marine environment.

OVERALL AIM

This project Intends to build a lightweight, low-power, monitoring module based on an underwater biomimetic robot platform to perform water quality spatiotemporal warnings, fish biomass estimation, benthic identification and provide a solution for realizing high-efficiency and high-quality comprehensive monitoring of deep-water cages.

MAIN EXPECTED OUTCOME/S

- Design and construct innovative integrated rigid-flexible coupling hybrid-drive bionic underwater robotic system prototypes with the capability of autonomous 3D positioning and localisation within deep water environments, and reduced noise and disturbance

IMPACT OF RESEARCH

The outcomes of this project will likely contribute to promote an environmentally healthier development of the aquaculture industry, resulting in economic, social environmental and political/diplomatic benefits.

1. Political and diplomatic benefits

This project involves the cooperation with international partners that has to potential to promote the cooperation in the market promotion of high-tech solution in the field of deep-cages aquaculture, contributing to the introduction of innovative solutions based on digital transformation. This will in turn promote the continuous expansion of new areas of international cooperation between Malta and China.

2. Economic benefits

The main aim of this project is to carry out the design of an underwater bionic robot system which integrates:

- A water quality spatio-temporal warning system
- A biomass estimation system
- An automated benthic population recognition system

The development and implementation of such a system has the potential to upgrade the traditional aquaculture model towards a more efficient ecologically-sustainable aquaculture system, based on digital transformation. This will allow to develop an aquaculture production process based on more scientific, digital, and precise data, thus reducing the economic loss often caused by a blind aquaculture production, while improving the environmental impact.

3. Ecological Benefits

The implementation of this project has the potential to provide scientific data to monitor real-time changes of environmental factors in the aquaculture process. The research will combine physical models and simulations to reduce the harm caused by water quality mutations to fish growth, while providing real-time fish growth data that will improve the production processes. This will allow for a more accurate and scientific decision-making process for the use of bait, fertilization and drugs in the aquaculture process, that is likely to result in a significant reduction of wastes. Thus, such technology and approach will contribute towards reducing the impact that the aquaculture industry usually has on the environment and surrounding ecosystems, while promoting the transition towards more sustainable models.

Project AMBULANT received funding from the Malta Council for Science and Technology (MCST) and the Ministry for Science and Technology of the People's Republic of China (MOST), through the Sino-Malta Fund 2021 (Science and Technology Cooperation) under grant agreement number SINO-MALTA-2021-18.

ECOdesign4EU: New training contents and joint VET qualifications on Ecodesign for Creative and Cultural Industries

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BACKGROUND

ECOdesign4EU project is a 3 year project that aims to design a new European ECVET Curriculum of reference on Ecodesign for sustainable CCIs, promoting innovative work-based learning methods and pedagogies addressed to Initial and Continuous VET students, and target beneficiaries of the project, in order to acquire and apply Ecodesign principles to CCIs, contributing to lead the transition to a Circular Economy in these sectors. The project will apply also successful and innovative VET methods and tools in Ecodesign principles applied to CCIs, previously tested by the partners. The project consortium consists of 8 European VET experts and providers, companies and intermediary bodies of the CCIs originating from 7 countries: France, Greece, Italy, Ireland, Malta, Spain and UK. The target users and beneficiaries of this project are: (i) VET teachers, trainers and mentors (ii) Initial and Continuous VET students. The project will use European frameworks of reference, such as EQF and ECVET, to promote new learning pathways and boost transparency, recognition and mobility in the CCIs sectors in Europe. Key sectorial and VET associated partners and stakeholders of the CCIs, the VET sector and the Green Economy involved in the project will support the dissemination of the project products and contribute to mainstream the final results.

OVERALL AIM

The main aim is to design a new European ECVET Curriculum of reference on Ecodesign for sustainable CCIs, promoting innovative work-based learning methods and pedagogies addressed to Initial and Continuous VET students, and target beneficiaries of the project, in order to acquire and apply Ecodesign principles to CCIs, contributing to lead the transition to a Circular Economy in these sectors.

MAIN EXPECTED OUTCOME/S

The main expected outcomes from ECOdesign4EU project include the following deliverables:

1. European ECVET Curriculum of reference on Ecodesign for sustainable Creative and Cultural Industries

2. ECOdesign4EU Virtual Campus, which will include: (i) an Online Instructional Guide on Digital Competencies for Virtual Learning; and (ii) a set of structured Training Modules (iii) Vocational Open Online Courses (VOOC)
3. Ecodesign4EU Mobile Assessment App
4. Guidelines to foster transparency and recognition of Ecodesign for sustainable CCIs

RESULTS

1. European ECVET Curriculum of reference on Ecodesign for sustainable Creative and Cultural Industries
2. ECOdesign4EU Virtual Campus, which will include: (i) an Online Instructional Guide on Digital Competencies for Virtual Learning; and (ii) a set of structured Training Modules (iii) Vocational Open Online Courses (VOOC)

IMPACT OF RESEARCH

The project will have a direct positive impact in:

i. Partner organizations and entities involved in the project activities. They will improve their training methods and tools; the teaching skills and competencies (including digital skills) of their trainers and teachers; the quality and relevance of their VET courses and work-based learning programmes.
ii. I-VET and C-VET students. They will improve their Ecodesign through better WBL programmes, opening new opportunities for training, job and mobility.
iii. CCIs sectors. They will count with new training instruments to improve the competitiveness of the sector and supporting its transition towards more circular business models.

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Remote learning and examination based on augmented reality (concept)

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BACKGROUND

Remote Learning and Examination based on Augmented Reality (RELAR) is a European Erasmus+ project (2020-1-NL01-KA226-VET-083043) that aims to create a crisis-proof resilient education environment, enabling remote coaching and digital skills training based on AR. RELAR integrates seven European partners –Vocational Training Institutions and Higher Education Institutions– all linked to the maritime industry. The industry itself is also represented.

With the help of a reference group, a set of learning outcomes has been defined to develop three demo scenarios to test and demonstrate the RELAR system, which is based on the RealWear HMT-1 assisted reality hands-free computer. All scenarios are scaffolded on the same framework that integrates active learning pedagogy, curriculum requirements and technological integration.

This digital active learning process pedagogy incorporates two processes for instruction: a remote instruction process called 'Expert Coaching' that gives the students the possibility of receiving instant feedback while taking actions and decisions; and a remote assessment process named 'Digital Workflow' that incorporates formative assessment to consolidate learning. The curricular aspect focuses on the professional competencies students will acquire, the expected learning outcomes, the required knowledge, and the transferable skills required by students to perform professionally. Finally, technological integration describes how and when the assisted reality system should be incorporated to add value to the learning process.

MAIN EXPECTED OUTCOME/S

RELAR project will deliver two Intellectual Outputs (IOs):

- Architecture and framework (IO1) contemplate technical development aspects.
- Commons (IO2) incorporates the pedagogical aspects of the project.

IMPACT OF RESEARCH

RELAR project aims to create a crisis-proof resilient maritime educational ecosystem by enabling remote learning and examination using Augmented Reality (AR). The

project addresses the difficulties of the maritime and port education ecosystem caused by the situation unearthed by COVID-19 and any other crisis that may affect face-to-face education and training. In this context, new digital technologies such as AR can make it possible to transfer the expertise and knowledge of industrial organisations while improving security, safety, and efficiency by empowering frontline connected trainees and workers with remote technology. The RELAR consortium partners will identify and adopt a joint architecture and framework for future interoperability, scalability and sustainability of remote learning. The core concepts of the architecture will be inspired by the background and experience of functional design approaches for remote learning and assessment developed by STC Group for maritime education.

Erasmus+ *This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein [Project Code 2020-1-NL01-KA226-VET083043].*

Malta Food Citizen Lab - Increasing trust in local produce and food safety.

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BACKGROUND

Food safety is one of the important areas of public health, and it has become very important to improve the health literacy of the society in this area. The EIT Food Trust Report 2021 reveals the lack of trust in government authorities on food production. According to a study in the EIT Food Trust Report 2020, 47% of European consumers trust public authorities who are playing a regulatory role in the food system. Although both Turkish and Maltese authorities address these issues with several measures and campaigns, the consumer trust in food systems, in particular to locally produced food has not been improved as there are still knowledge gaps within the society. In addition, it has been observed that both in Malta and Turkey there are not any dedicated forums or platforms where citizens can learn about food safety in a scientific but understandable format, experience/interact with food producers/farmers as well as an understanding of how the monitoring performed by government agencies and on how to raise their concerns on food safety to the relevant authorities. Therefore, the motivation of the solution is to increase consumer trust in food with a special focus on the locally produced food in Malta and Turkey.

The Malta Food Citizen Lab

OVERALL AIM

Malta and Turkey Citizen Labs will be positioned as a dynamic platform to support ongoing efforts of the countries to increase consumer trust in food safety whereby consumers will be given access to up-to-date information from trustworthy sources including scientists, consumer organisations, farmers and government bodies in an understandable and engaging format and to facilitate an active and transparent dialogue opportunities between citizens, farmers/producers and authorities.

Consumers who are engaged with the Citizen Labs will also be instructed to use online tools for promotion and engagement activities and will be offered materials to disseminate among their communities. It is intended that the community of Turkey and Malta Citizen Labs then be connected to the EIT Food Ambassadors programme and most importantly connect with a wider community within RIS countries who are facing similar problems.

MAIN EXPECTED OUTCOME/S

As a start, the programme will directly reach a minimum of 150 consumers through events and 60 participants will be selected as Food Trust Ambassadors and will be trained on local food safety and supply systems. These ambassadors then will act as multipliers in their communities and a wider audience will be reached. The activities planned to be carried out throughout the project are listed on activity description. By following this methodology, whether the project achieves its goals or not will be traceable through the access rates of the survey and communication and dissemination activities.

RESULTS

As of 16/11/2022, 25 people registered to join the Food Trust Ambassador programme in Malta. The first one-hour livestream on the topic of Basic introduction on plants growing, overview of pests and diseases and control methods used, was conducted on 04/11/2022 by Malcolm Borg, D. Director | IAS- Centre for Agriculture, Aquatics & Animal Sciences, MCAST. This livestream has reached 330 people on Facebook and got 127 impressions on LinkedIn.

A face-to-face training for Food Trust Ambassadors will be hosted at MCAST on 18/11/2022. This training is to equip participants with science-based knowledge to increase trust in local produces and food safety in Malta. The training will be delivered by scientists and key authorities on 5 important topics: 1. Overview of Malta produces (fish, vegetables, animal products and seasonality); 2. Methods and system to reduce pesticide use; 3. Antibiotics in animal products; 4. Food safety act: Food chain in Malta regulations on safe food; And 5. Communications on social media. The second livestream will be held on 25/11/2022, on the topic of the work of the Malta Competition and Consumer Affairs

Authority (MCCAA) to protect consumers and to ensure product safety on the local market. A farm visit and final event with cultural cooking will be organised on 05/12/2022.

IMPACT OF RESEARCH

Improving the negative effects of important public health problems such as the pandemic on the consumer's perception of food safety: By demonstrating the impact of the trainings to be given in the project, these trainings developed for the consumer are aimed to be an example of good practice. This proposal aimed to change the negative food safety attitudes and behaviours of the consumers in Europe. With this goal, as the consumer's perspective on food safety will change, food attitudes and behaviours will also change positively. In addition, in the short-term Citizen Labs will focus on reinforcing positive new beliefs based on science and experience about local produce. Training activities from domain experts on the local food supply systems, safety, sustainability, nutrition and quality and in particular on increasing knowledge on the chemicals and plant protection processes.

Access to online learning resources: For the project results to reach out to consumers more easily and disseminate to more people, access to the online learning materials will be open. Malta and Turkey Citizen Labs aim to contribute to the European Union food system on food safety. The project will impact the system by facilitating opportunities for active and transparent dialogue between citizens, farmers/producers, and public authorities. The positive results of the project on the target group will make it possible to achieve the same impact on society.

Long-term impact: The COVID-19 pandemic has had environmental, economic and social impacts on society. It has caused behavioural changes in many consumers and even people's consumption habits have changed. Consumer concerns about food safety have increased. The project aims to reduce the concerns of consumers about food safety with the programme it will develop.

eit Food

Co-funded by the European Union

Electronic and mobile government services in Europe: The state of play and policy recommendations

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BACKGROUND

OECD (2014) clearly specified that it is in the governments' interest to utilise digital technologies as a strategic driver to improve the efficiency of their public sectors, and to improve their customer services. This intergovernmental body clearly designated that Governments ought to utilize resources, competences and capabilities to deliver service quality through their digital systems. It put forward its recommendations to encourage governments to adopt citizen- and business-centred approaches, by offering open, transparent, innovative, participatory and trustworthy services.

The European Union (EU) Commission is actively supporting its member states to implement its vision, political priorities and objectives relating to the provision of electronic government (e-gov) systems, for the benefit of consumers. The EU recognised the importance of the digital transformation of its member states, as early as 2006. Every year it publishes its e-government benchmark report which compares the penetration, and digitisation services of all EU governments.

The EU's eGovernment Benchmark reveals how and to what extent the European countries are delivering digital public services (eGov Benchmark, 2022). It uses four dimensions to evaluate its electronic service quality, including: (i) user-centricity (in terms of online availability, user support and mobile friendliness), (ii) transparency (of service delivery, personal data and service design), (iii) key enablers (e.g. secure access through electronic identification (eIDs), authentication of electronic documents, the validation of prefilled forms, and the like), as well as the provision of (iv) cross-border services (Desi, 2022).

OVERALL AIM

This contribution provides a critical review from academic and non-academic sources, that is focused on the drivers and barriers that are facilitating or detracting consumers from using the government online services. It also evaluates regulatory policies and guidelines on digital government in the European context. It scrutinises European Union (EU) regulatory policies with a special focus on Malta, the smallest European state. In conclusion, it puts forward theoretical as well as practical implications to policy makers and society.

MAIN EXPECTED OUTCOME/S

The Digital Economy and Society Index (DESI) indicates that Malta is one of the top European performers in the provision of digital public services for citizens and for businesses. However, it also noted that there is room for improvement in terms of the Maltese government's commitment to open data management. This review outlines plausible recommendations for policy makers. The researchers shed light on the latest Digital Economy and Society Index and on the results from eGovernment Benchmark 2022. They elaborate on the progress of Malta, in its provision of e-gov and mobile government (m-gov) services.

RESULTS

Malta committed itself to implement highly accessible online public services for the benefit of citizens and businesses, in its declarations, during the fifth Ministerial eGovernment Conference held in Malmö (Sweden) in 2009. It clarified that it shall implement inclusive, user-centred strategies to ensure that consumers are satisfied with the Maltese government's electronic services.

Currently, the Maltese consumers can access a wide array of e-gov services relating to culture and leisure; police justice and defence; educational science and technology; health and community care; environment, energy, agriculture and fisheries; work and employment services; transport and communications; inclusion, equality and social welfare; identity, citizenship and immigration; tax and finance; economy, business and trade, among others (through servizz.gov.mt).

The latest European Union (EU)'s eGovernment Benchmark indicated that Malta emerged as the top ranked country for the provision of eGovernment services, with a score of 96%. The smallest European island-state was followed by Estonia, Luxembourg, Iceland, the Netherlands, Finland, Denmark, Lithuania, Latvia, Norway, Spain and Portugal. The average performance across EU countries was 68% (eGov Benchmark, 2022).

EU's latest Country Report for Malta indicated that the share of people interacting online with public authorities has increased over the past few years. This metric has exceeded the EU average (EU, 2022). Malta is among the top performers (with Estonia, Finland and the Netherlands) in the digitalization of its public services.

The Digital Economy and Society Index (DESI) indicated that Malta ranked first in the provision of fully, partially or offline digital public services for citizens and third in the provision of digital public services for businesses across EU member states. The latter finding suggests that the Maltese government's online services are "available online and across borders in other EU Member States". Malta also ranked fifth out of 27 EU countries on the extent to which data that is already known to public administrations is pre-filled in forms that are presented to online users (Desi, 2022).

On the other hand, Malta placed 16th out of 27 countries when the index compared the number of e-government users who are interacting with public authorities over the Internet in the last 12 months (Desi, 2022). Malta ranks among the lowest in the EU on the government's commitment to open data, in terms of open data policy, open data impact, open data portal and open data quality (EU, 2022). The Maltese government ought to understand the impact derived from open data and should implement action plans to improve its performance on these metrics (Desi, 2022).

IMPACT OF RESEARCH

- Implications to academia

This contribution provides a critical review from academic and non-academic sources, that is focused on the drivers (and barriers) that are facilitating (or detracting) consumers from using the government online services. The relevant literature confirm that the governments' digital presence is improving their effectiveness, economies and efficiencies (DESI, 2022; OECD, 2014). E-gov technologies are facilitating the governments' interactions with individuals and organisations. On the other hand, online users who utilise e-gov systems are accessing large volumes of data and benefiting from the governments' online services (Evans & Campos, 2013; Rana & Dwivedi, 2015). Consumers are serviced through fast, convenient, responsive and less costly electronic services (Akman, Yazici, Mishra & Arifoglu, 2005; Shareef, Kumar, Kumar & Dwivedi, 2011), thereby reducing their travel requirements to and from the governments' physical premises. A number of academic studies indicated that the provision of e-gov services is more efficient than offline, face-to-face service environments (Authors, 2020; Hu, Yan, Pan, Chohan & Liu, 2019; Kumar, Sachan & Mukherjee, 2017; Unsworth, Forte & Dilworth, 2014). Most e-gov systems are designed to be functional, inclusive and user-centred, in terms of their online availability, user support and mobile friendliness. In many cases, they can integrate their electronic services with offline-assisted customer services. In addition, they may also offer transparent and secure transactions, both locally and across borders.

- Implications for policymakers

This contribution provides a critical review from academic and non-academic sources, that is focused on the drivers (and barriers) that are facilitating (or detracting) consumers from using the government online services. Many governments (including the Maltese regulatory authorities) are realising that they should continue improving the delivery of their online services by enhancing their user-centricity for the benefit of all individuals and organisations, by increasing their transparency, identifying key enablers and by improving their cross-border services. It is in the governments' interest to foster an environment that enables closer communications amongst its departments and agencies, to improve their service

delivery to consumers. Well-orchestrated networks across government entities will ultimately benefit users. Policymakers are expected to forge relationships with external stakeholders including with ICT service providers, innovative start-ups and other innovators to refine their digital government services.

The public services administrators should continue investing in infrastructures and facilitating conditions that promote an interoperable exchange of secure data to deliver proactive services to improve their consumers' online experiences. Last, but not least, they have to regularly evaluate their consumers' perceptions and attitudes on their online and mobile services in terms of their ease-of-use, usability, design and content attractiveness, functionality, convenience and responsiveness, trustworthiness and satisfaction with them, to better understand the drivers and barriers that can influence their engagement with the governments' digital services.

- Implications to society

The designs of electronic and mobile government services ought to meet and exceed their consumers' expectations including those of technology-savvy individuals. They have to be considered functional and easy to use by those persons who possess low or no digital skills. This research implies that consumers ought to be facilitated to access the government's websites via desktop computers and mobile devices including smartphones and tablets. Individuals and organisations should be in a position to access the secure e-gov and m-gov services through broadband connectivity or via Wi-Fi through different venues (including via local councils).

This project is supported by the Digitalization Unit within the servizz.gov within the Office of the Prime Minister.

Mediterranean climate innovation accelerator programme

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BACKGROUND

MED-ClimAccelerator is a Place-base Acceleration programme. Med Accelerator will be rolled out in three EIT Climate-KIC RIS locations (Portugal, Cyprus and Malta) via local implementation partners and EIT Climate-KIC Hubs.

MED ClimAccelerator is the only EU acceleration programme focused on climate impact by clean-tech commercialisation. In three stages, our programme brings the knowledge, resources, tools and the coaching a climate impact start-up needs for success.

OVERALL AIM

The programme aims to support local clean-tech entrepreneurs (all three stages according to EIT Climate-KIC terminology) and provide them with state-of-the-art coaching and training as well as access to financial support and networking opportunities. The delivery partners in the EIT RIS countries are responsible for all local components of the programme, grant management and reporting, aligning closely with provided guidance and rules.

MAIN EXPECTED OUTCOME/S

This accelerator is designed to provide start-ups and their founders with tailored training and support as they work towards moving to the next stage of development and grow into a sustainable, profitable and eco-conscious business. The training is divided according to three Stages to ensure that the start-ups receive the most appropriate knowledge and skills according to their needs.

RESULTS

This programme is supported by EIT Climate-KIC, the biggest network of cleantech and sustainability companies and institutions inside the EU, funded by EIT and Horizon Europe. It is locally implemented by Building Global Innovators (BGI) in Portugal, Chrysalis LEAP in Cyprus and Malta College of Arts, Science and Technology (MCAST) in Malta to empower innovative start-ups and facilitate the adoption of circular economies and green technologies to tackle climate change.

The programme culminated in a Demo Day, in which the most promising Stage 2 and 3 start-ups have the opportunity to present their businesses to cleantech investors, fostering collaborations and investment deals. This is also an opportunity

for all start-ups to present their journey and achievements throughout the programme.

IMPACT OF RESEARCH

The programme's aim is to support local cleantech entrepreneurs (in the first three Stages of development according to EIT Climate-KIC terminology) and provide them with state-of-the-art coaching and online training, as well as access to financial support and networking opportunities. The bottom line is success, both for the start-ups and their founders, and for the environment with tangible climate solutions. MED-ClimAccelerator not only catalyses the advancement of participating start-ups from one Stage to the next but works towards ensuring that the start-ups will be successful beyond the scope of this programme.

Higher Education Innovation Growth and Training: heightening sustainable innovation in our HEIs and societies

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BACKGROUND

HEIght, is an initiative of a pan-European consortium of four forward-thinking higher education institutions (HEIs), namely MCAST (Malta), UCLan UK (UK), UCLan CY (Cyprus) and Özyegin (Turkey) and one actor from another side of the Knowledge Triangle, the National Centre for Entrepreneurship in Education (NCEE) UK, united to cultivate a mutually beneficial and collaborative consortium. It leverages existing innovation and entrepreneurial knowledge of all the partners and draws on the resources of HEInnovate to spur on growth of the sustainable innovation in our communities and in our institutions. HEIght delivers on our shared vision of prosperous, inclusive and climate-resilient societies where food systems and other areas of human activity that are sustainable, trusted and healthy contribute to net zero carbon emission economies through a structured programme of work packages. Through training, designed and tailored to developing innovation and enterprise, these activities support the development of academic and non-academic staff and students.

OVERALL AIM

HEIght delivers on our shared vision of prosperous, inclusive and climate-resilient societies where food systems and other areas of human activity that are sustainable, trusted and healthy contribute to net zero carbon emission economies through a structured programme of work packages. Through training, designed and tailored to developing innovation and enterprise, these activities support the development of academic and non-academic staff and students. Across two phases, HEIght achieves KPIs of delivering training (including mentoring) to 645 students, 66 academics and 66 non-academics in order to build innovation and entrepreneurial capacity within HEIs across the consortium, EIT HEIs, the EIT KICs and into society. Sustainability is achieved through enabling lifelong learning, particularly through the development of Communities of Practice which can grow from the consortium to pan-European Member States.

MAIN EXPECTED OUTCOME/S

Through open resources, stakeholders are enabled with tools for transformative change beyond the life of the project. HEIs will develop capacity in innovation and enterprise and a train-the-trainers method will ensure exponential growth of

academic and non-academic expertise and skills to support capacity building of innovative and entrepreneurial staff and students to effect great societal innovation.

RESULTS

The HEIght consortium will take full advantage of the HEInnnovate resources to enhance the innovation potential of member institutions, enhance curricula, upskill students and staff and support start-ups and spin-offs. But our activities will also make a number of unique contributions. Amongst those will be the Amplify Innovation & Enterprise project that will aim to demonstrate to stakeholders that the institution's knowledge exchange performance as measured externally is significantly and reliably predicted by its internal culture of innovation. Such findings are expected to underline to decision-makers the need to address institutional dimensions (including those identified by HEInnovate) and, furthermore, to give them an agenda for action. The HEIght project offers the opportunities to identify and share good practice within and across institutions. Throughout the project phases, we will lean heavily on the HEInnovate resources to spur on activities that will foster the innovation potential of our institutions, sharpen the quality of our curricula and develop academic and non-academic staff.

IMPACT OF RESEARCH

Long-term, HEIs will have the tools to understand how to increase innovative and entrepreneurial capacity within their organisations and how to develop self-managed learning partnerships through a Communities of Practice approach. Self-management ensures that the success of lifelong learning is not reliant on further funding.

HEIght aims to produce the next cadre of entrepreneurs that will secure a seamless transition to a decarbonised economy via supporting a mind-set that drives effective climate and social innovation. This will help students achieve the most important competencies such as creativity, systems thinking and complex problem-solving skills and therefore embrace capacity building in the area of climate action with the aim of developing the necessary expertise, research and innovation in the area of low carbon development.

eit Climate-KIC

Funded by the European Union

Training in aquaculture: an international dimension

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BACKGROUND

One of the main aims of ERASMUS projects is the establishment of collaborations between different countries and different institutions within the European Union. These projects include both the industry, education and the public in general. One such project is the Aqua-view project ("Future proofing a common and transparent Vital European learning and Workforce platform for sustainable AQUAculture practices"; Project Code: 2019-1-NL01-KA202-060275). This is a three-year project which was initiated in October 2019 and which is a collaborative project between eight partners from seven different European Union countries specifically, the Netherlands, Slovenia, Spain, Austria, Belgium, Italy and Malta. The Centre for Agriculture, Aquatics and Animal Sciences within MCAST's Institute of Applied Sciences is the representative partner for the Maltese Islands. The ERASMUS partners who are participating in this project hail primarily from aquaculture or applied sciences vocational colleges or universities.

In Europe there are many programs to stimulate aquaculture and many developments are taking place. More sustainable production methods (new types of fish, algae and seaweed), innovative production techniques, alternative feed raw materials and system innovations play an important role in the production of high-quality food. It also makes the sector challenging for current and future employees. The developments demand well-trained employees at all levels. In many European countries there appears to be a gap in training that trains employees for the more complex executive tasks in aquaculture production. This concerns in particular employees at EQF (European Qualification Framework) level 4 and 5. A long term aim is to raise the quality of skills of (starting) professionals and raising the quality standards in the industry, thus achieving the European objectives for aquaculture.

OVERALL AIM

To develop European training units at EQF level 4, at EQF level 5, and in work based learning programs for lifelong learning. The partners will prepare students, professionals in training and adults by offering them international learning units that are built around new and common innovative subjects in aquaculture. These units will not only offer the knowledge and competences attributed to the specific area of aquaculture, but will also allow for student mobility and hence, the expertise of different professionals within the sector will be exploited better.

MAIN EXPECTED OUTCOME/S

Based on input from enterprises, VET- and University colleges, partners will develop outcome-based learning units at EQF level 4, and international training learning units at EQF level 5. To ensure that the outcomes are properly connected to the aquaculture industry, importance was given to examine the needs of industry. Special focus was placed on requirements (competences, knowledge, skills, autonomy, responsibility and complexity) that are required by international companies.

RESULTS

Several international units at EQF level 4 and level 5 have been designed, as well as work based learning programs for lifelong learning. Attention was given to basic matters such as biology and ecology, technical matters such as aquaculture systems, water quality and breeding techniques. In addition, units that focus on business management and marketing were also designed. As a result of this project, a European platform for education and industry in aquaculture (Aqua-EduNet: Aquaculture European education and industry network)) and a Transnational network for professional education (Aquaview) were also established.

IMPACT OF RESEARCH

This project contributes to the SDG's and European objectives by ensuring the development of food security, food safety, and sustainability within the sector, levelling differences across Europe, optimizing innovative effectiveness, promoting new entrepreneurship with sustainability at the forefront of their operations, exchanging students, staff, professionals working in the sector between partners in International education and enterprises and by increasing and enhancing labour quality and mobility within the aquaculture sector.

Based on industry needs, European targets and the sustainable development goals (related to food, soil, water and energy), vocational education can contribute to the development of future employable workers, who can work internationally within the sector, shaping European labour mobility. The establishment of a European platform for education and industry in aquaculture and a Transnational network for professional education (both of which are important outputs of this project) will ensure sustainability and long term development of education on aquaculture.

MCAST benefitted from this project particularly since the lecturer networked with experts in the area from other foreign institutions, made contacts with overseas personnel who may help in organising trips for MCAST students in the future and obtained ideas on delivery and assessment. The College has been present and made visible during all project meetings as well as during a pilot of the units that was held in Spain in March 2022 and which included partners from six different countries. During this piloting, the lecturer helped collaborate with lecturers from different

institutions in the planning, organization, and execution of a week-long programme for level 4 and level 5 students. This helped the lecturer to improve on team management, decision-making and project management.
This project focused on the development of European education for secondary and higher vocational education in aquaculture. It is important to note that the learning units are planned to be incorporated in the partners' curricula. Student exchanges will further contribute to the success of this long-term partnership between different educational institutions.

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Transforming advanced water skilling through the creation of a network of extended-reality water emulative centres.

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BACKGROUND

WATERLINE aims to create a European Digital Water Higher Education Institution (HEI) Alliance, based on the quadruple helix model of innovation, leading to the development of the Alliance's research, educational and entrepreneurship capacities. This shall leverage the individual, institutional and regional resources required for a transformative structural and sustainable learning and innovation environment. To achieve this, WATERLINE has five specific objectives: (1) support consolidation of the Alliance by co-creating a common governance framework, and a Research & Innovation (R&I) capacity building plan; (2) co-create a portfolio of water components for Master level and transform emulative laboratories in partner Widening HEIs into assisted and virtual reality. These structural changes will lead to transformed and more competitive R&I HEIs; (3) strengthen WATERLINE researchers' R&I capacity excellence by implementing activities, such as summer schools to enhance education and R&I skills, and proposal writing workshop; (4) build a European network of academics/researchers who, together with quadruple helix actors, will allow knowledge flow in water domains and extended reality technologies. This allows greater involvement of regional actors in the R&I process and enhances one of the major societal challenges: water-related education. Moreover, it will strengthen academic and business links through academia-to-business meetings and a hackathon to mainstream entrepreneurship mind-sets. WATERLINE will, finally, (5) sustain the alliance by, (i) establishing ambassador networks, (ii) identifying the R&I funding landscape, thus increasing participation in HE and the mobilisation of resources in the water sphere, and (iii) creating synergies with EU initiatives, institutions, other projects and networks.

OVERALL AIM

WATERLINE's main aim is to create a European Digital Water HEI Alliance, based on the quadruple helix model of innovation, which "is an innovation and collaboration model with a citizen/end-user perspective"

MAIN EXPECTED OUTCOME/S

- EO1 - Formation of a Digital Water HEI Alliance amongst participating HEIs leading to enhanced cooperation and learning mobility across borders
- EO2 - Increased scientific excellence capacity for HEI academics/researchers in widening countries
- EO3 - Strengthened research capacity for HEI academics/researchers in widening countries
- EO4 - Technological changes to digital water learning environments leading to transformed and more accessible HEIs, especially in Widening countries
- EO 5 - Enhanced strategic networking between the participating HEIs and actors in surrounding ecosystems leading to the involvement of ecosystem actors in scientific and R&I activities
- EO 6 - Enhanced entrepreneurship mind-set and stronger relationships between HEIs and businesses

REULTS

Not Applicable. The project has commenced in October 22.

IMPACT OF RESEARCH

EIC1: "Structural changes leading to transformed and more competitive R&I HEIs, focusing on widening countries"

Due to the urgent necessity of research, education and skilling in digital water, the structural and strategic activities of the WATERLINE project will create a digital water HEI alliance that will transcend the boundaries of existing research and education limitations within the individual HEIs. Water-theme driven institutions such as the IWA, AWWA, CIWEM, and EWA all repeatedly drive and support applied water research initiatives. Therefore, structural changes merging engineering, information technology, science, and the social-science basis of digital water will drive and motivate early researchers to engage in a multitude of focused research, cross-topic research and applied research initiatives. This will be achieved through the co-creation of components of a common Master programme which will allow early-career researchers to enrol on modules offered by different participating HEIs within the alliance, transformed emulative centres into ARLE and ViLE enhancing flexible learning and competitiveness.

EIC2: "Strengthened R&I capacity excellence for HEI academics/researchers with a focus on widening countries"

The fundamental scope of the WATERLINE project is that of collaboration between and within the inter-university digital water campus framework. The collaborating institutions are not just traditional research universities but also HEIs, such as MCAST, that are now recognized as the applied science universities within Europe, as defined by UAS4Europe and EURASHE. WATERLINE, therefore, looks towards human capacity building and sharing of knowledge and methodologies. This will be achieved through the R&I framework which will be both top down and bottom-up. It shall be top-down in the creation of a capacity building plan for cross-institute research based on established successful research training programmes from non-Widening participating countries. It will be bottom-up as it shall build from nominated participating consortium members' interaction and guidance. Specific activities will also be carried out to enhance the capacity building of participating academics and researchers.

EIC3: "Greater involvement of regional actors in R&I process"

Various regional actors, including a range of industry and societal players within different industry settings, play a significant role in the water sector. For example, it is not only the large water utilities that are critical to water provision but also a range of SME's that are affected by water efficiency, water quality and even provide water-related products and services themselves. The general trend is for persons in these various industries to be under-skilled, often below degree level. Therefore, WATERLINE aims to map the skills matrix of these various industry and business stakeholders. WATERLINE will adopt RRI principles in order to engage with quadruple helix stakeholders early on in the project. WATERLINE will map and approach all relevant actors in the water sector and include them to create a multi-stakeholder perspective state of the art in relation to education, R&I, and current skills gap and skills mismatch on "Digital Water". The framework for the multi-stakeholder platform will be set up in T4.1. A multi-stakeholder consultation and involvement process shall also drive the design of the WATERLINE governance framework which will govern this Digital water HEI alliance.

EIC4:"Strengthening linkages between the academic and the private sector for effective knowledge transfer"

The vitality of providing the industry with knowledgeable workers and efficient solutions related to water utilization, cannot be over-estimated. It is no secret that only 3% of the water on Earth is fresh water, and only 0.5% is available for drinking. Responding to society's needs through industry and the private sector can only be achieved by providing a new generation of academics and programme graduates that can provide the industry with the knowledge capital required.

EIC5: “Increased participation in Horizon Europe and national schemes through mobilisation of national and European resources for strategic investments in the water sphere”

Funded by the European Union

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Spatial dynamics in Sartre's Huis Clos: how imperative is space in otherness?

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BACKGROUND

The starting point for this project will be the staging of Jean-Paul Sartre's modern classic Huis Clos, translated for the first time in Maltese as Bil-bieb mitbuq by Kevin Saliba. Sartre's play presents the narrative of three unrelated persons, captured for eternity in a hell. Unlike all stereotypical images, Sartre's hell is a room, composed of three sofas. By the end of the play the characters realise that their hell is otherness, articulated in the famous line, uttered by Garcin, 'L'enfer c'est les autres'. The main research question that is being explored in this research project: how can space be used as a way of showing oppressive dynamics in relationality? This practice as research project will be informed by an existentialist theoretical framework. Major works of Sartre, both literary, as well as philosophical, will be consulted to gain a better and deeper understanding of otherness. These readings will be juxtaposed against other major works of existentialist literature, such as literary and philosophical works by Albert Camus; the philosophy of Kierkegaard; and the philosophical work of Merleau-Ponty, as well as the writings by Simone Weil. Other secondary sources, particularly related works published in the last five years, will be studied to take into consideration the latest developments on the subject in contemporary Sartrean thought.

OVERALL AIM

The project is a practice as research project, whereby through my participation in the process as director, I will examine the spatial dynamics of this performance in relation with the theme of otherness.

MAIN EXPECTED OUTCOME/S

In this particular production, staged at Spazju Kreattiv, I want to experiment with the notion of the space in a reverse manner. In the first half of the play, where the three characters are trying to understand where they are and why they are in this place together, they will be enclosed in a 3 metres by 3 metres enclosure made of gauze. The spectators will be observing the characters through these gauze walls in the same way how a clinical psychologist might observe the behaviour of a patient from a one-way mirror. This places the spectator as observer, completely independent and detached from the dynamics that they are viewing. In other words, the spectator will comfortably believe that they are 'innocent' and that they do not deserve to be in this hell, and are safe from the plague of otherness. In the second half, where the characters have a clearer understanding of where they are, and seek

if there is any form of escape route, the gauze walls will be suddenly lifted up, and the characters will use all the theatrical space, including the areas close to the audience. All of a sudden, unexpectedly, the audience will become part of the action, and find itself in hell as well. Hence, when Garcin shouts out his infamous line, the audience by this point has no other choice than to admit that even for them 'hell is the other'. The fascinating aspect of this approach is that the enclosed space is safe, whereas it is the open space which is not. Hence this approach challenges the perspective that openness is safe: on the contrary, the fact that openness leads to the possibility of entering more into contact with the other, can be threatening, according to Sartre.

RESULTS

The findings of this research project will be presented as an academic paper. This paper will be pitched for publication with an international journal. The performance will also be documented through videography.

This project is supported by the Project Support Grant managed by the Malta Arts Fund.

Digitalization of public services: case studies.

Eleni Tsitsirigou

MCAST Research and Innovation Center ARIC

BACKGROUND

Countries around the globe are operating towards digital nations. Most of them, not to say all, are facing some challenges on the way of that formal process. As nations increasingly see a need for digitalization, Malta is realizing that moving from digital transformation toward the realization of a digital nation to provide citizens with better public services and contemporary solutions is a need. That brings a number of social challenges and technological underpin.

The global economy today is rapidly transforming, driven by disruptive digital technologies existing shape and create a new model of business development, with an overall effect on everyone that branches the Maltese economy. This study examines the case study of three EU countries that went through the same challenges over the past 3 years and they were progressing very successfully. The countries are Sweden, Cyprus, and Estonia.

OVERALL AIM

The overall aim is to investigate successful factors of digital transformation. Currently working on the three countries that have characteristics that will help and support the Malta OPM project overall. Those characteristics are construct on country size, on population earning and status, on level of education, but also on government strategies and overall timeline. This phase is aiming to get in depth understanding, of the interplay of different nations. Additionally will identify how they created value for the nation over digital transformation.

MAIN EXPECTED OUTCOME/S

Malta is called upon to adopt a "comprehensive" digital strategy in the medium-term horizon, which will dynamically push the country towards its complete digital transformation. That will positively strengthen its digital maturity as well as the development of the economy overall. The main expectations at this stage are to understand the digital transformation. To examine the current state of digitalization and its value. Simultaneously, barriers and changes will be identified, and recommendations will be proposed.

RESULTS

Project and research are still in progress, but some results are obvious.

Nations Digital transformation remains top of the agenda.

People value the digital transformation, but barriers are keeping some of them out of reach.

Significant changes took p-lace over the past two years (COVID19) but not everyone is adapting fast.
Public sector can cooperate with the rest of the public bodies, in order to co-shape, simplify and improve the user experience of the service. It will ensure cooperation with the private sector shaping high-quality data to support the quick decision-making.
Essential prerequisite for the successful design and provision of "user-centric" digital services is the digital training of public sector executives. In this context, it is endorsed the assessment of the digital training requirements of its different groups of executives' public administration.

IMPACT OF RESEARCH

This study will affect overall the overall process of digital transformation in Malta, trough in depth analysis of expected barriers and changes that will need to be considered and implemented. It will enhance the possible solutions to a more holistic and agile approach for safe and positive perceived digital transformation.

This project is supported by the Digitalization Unit within the servizz.gov within the Office of the Prime Minister.

Nutritive values of forage plants with chemical and microbiological results on silage composition and determination level of desirable and undesirable substances in silage

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[4]*CIHEAM Mediterranean Agronomic Institute of Bari*

BACKGROUND

In the Project AGRIHUB there has been selected and cultivated different forage plants, different cultivars and used different locations to permit forage plants to be analysed and to establish the level of plants adaptability, nutritional plants value and suitable method of ensiling and preservation of forage plants, by silage making. The forage species/varieties for the first trial were to see how they would adapt in the Maltese environmental conditions. The project aims by including trials on different forage/protein crop species/varieties to identify suitable species and strategies for arable farmers to use. For a quality forage programme it is essential to have diversity of crops, using a variety of species, a mix between annual, perennial, small grains, grass and legumes. The forage programme includes small grains annual such as wheat forage (Triticum aestivum Var. Trica) and barley (Hordeum vulgare L. var. Jallon), but also the short term perennial legume sulla, Hedysarium coronarium, forage pea (Pisum sativum var. Arvika), egyptian clover (Trifolium alexandrinum var. Alex) selected for their physiological traits, high yields and high protein content.

OVERALL AIM

The goal of making silage is to produce a stable feed with a high recovery of dry matter, energy and highly digestible nutrients compared with the fresh crop. By analysing the forage plants we ensured accurate information on the composition of feed ingredients and determining the level of desirable and undesirable substances, enabling the farmers and livestock holders a production of safe and balanced diets for livestock.

MAIN EXPECTED OUTCOME/S

Ensuring accurate information on the practical silage making with forage species adapted to Maltese land and climate, nutritive value and composition of silage, determining the level of desirable and undesirable substances in silages, enabling

the farmers and livestock holders a production of safe and balanced diets for livestock.

RESULTS

The results performed on the silage analyses, in the first batch silage samples after one month are the energy, protein and dry matter composition; the results from the set list as the main test forage analysis that includes: gross energy, moisture, crude ash, crude protein, crude fat, crude fiber and total sugars. Also on the silage were performed mineral analysis insoluble ash, starch, mineral and trace elements: calcium, phosphorus, magnesium, potassium, cooper, zinc and gross energy (MJ/Kg). The results are important to understand silage quality and the analyses we performed related to the mineral analysis of the silage give further in-depth information to help with ration planning; it gives an indication of the level of soil contamination and it also allows mineral deficiencies in forages to be counteracted with mineral pre-mixes if necessary. Additionally pH, the fiber fraction as per neutral detergent fiber (NDF), acid detergent fiber (ADF), acid detergent lignin (ADL); the qualitative tests for Clostridium spp., Escheria coli and Listeria spp.; and the quantitative Lactic acid bacteria (LAB) present in the silage.

IMPACT OF RESEARCH

The chain in agricultural industry related with livestock is in close relationship with the level of quality on farms products. For example having silage instead of hay is a better and more desirable product to be used. Knowing all about good silage making is related to the quality of the crop, the quality of harvesting, the crop conservation and ensiling. Therefore, knowing silage quality must be the starting point in planning in any winter feed livestock and farmer producer as they can generate cost effective decisions in farming, generating profitable and more reliable incomes. The study has also a big impact on the research of silage making in Malta, and also on the marketing between farmers and livestock holders with quality feed for animals which will reflect on the consumer tables.

The European Agricultural Fund for Rural Development
Europe investing in rural areas

The European Agricultural Fund for Rural Development: Europe Investing in Rural Areas under contract number 21628/239252/2021.

Intelligent Tools for Crops

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BACKGROUND

The team created multiple tools at TRL-8 which could be used in the grape vine farming industry. The tools include (i) vison-application software which could analyse time series RGB and IR/NIR grape vine photos, (ii) irrigated water measuring devices and software tools for analytics (iii) an unmanned ground vehicle (UGV) to complement the drone system and automate tasks

OVERALL AIM

Project aims to cross the bridge from research projects to a ready commercial reliable, affordable systems, which could be used by grape vines and possibly by other agriculture farmers and industries.

MAIN EXPECTED OUTCOME/S

a. To gain a state-of-the-art technological solutions which are tested and built around farmers' needs,
b. Move from manual work to automation: Tools will eliminate the intensive work which is carried by viticulturists as to the current procedures used in vineyards.

IMPACT OF RESEARCH

Control of Knowledge. The tools will allow the viticulturists and farmers to gather information data by means of drone imagery, gathers pesticides quantities and store data on the cloud. The system will allow also highlight any real-time problems in the fields. Moreover, farmers will be able to refer to past techniques for comparison, if need be.

Deployment Models. The tools will allow farmers and viticulturalists to store data on the cloud for an unlimited time. Thus, any gained information, could be retrieved for years to come

Optimal Data Analysis. This project cloud proof to be a perfect showcase for optimal Data Analysis in the wine industry.

Project CIXT financed by the Malta Council for Science & Technology, for and on behalf of the Foundation for Science and Technology, through the FUSION: R&I Technology Development Programme under grant agreement number R&I-2016-031T.

Modernisation of Agriculture through more efficient and effective Agricultural Knowledge and Information Systems

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BACKGROUND

In times of increasing pressure on the use and management of natural resources and high political and societal ambitions with respect to sustainable ways of food production, the European Union (EU) has defined visionary goals (e.g. European Green Deal) to tackle climate change and sustain a healthy way of life. Within this context, the timely access and ability to integrate rapidly evolving scientific knowledge, innovation and technological developments across all actors who participate in agricultural value chains is key to a successful transition towards the European vision. This is in fact reflected in the 2021-2027 Common Agricultural Policy (CAP) design that stipulates the importance of effective Agricultural Knowledge and Innovation Systems (AKISs) in this regard. AKIS is considered a system that links people and organizations to promote mutual learning, to generate, share, and utilize agriculture-related technology, knowledge, and information. Components of an AKIS are diverse actors from the private, public and non-profit sectors relating to agriculture and may include farmers, researchers, advisors and supply chain actors amongst others. However, the AKIS concept itself and its working principles are not yet widely known and embraced, and the capacity of decision makers to use and to contribute to the AKIS governance is underdeveloped with important challenges remaining ahead. Amongst other challenges, AKIS systems in the EU countries are marked by their diversity at national, regional and even local level, with repercussions on effective flows of knowledge and synergies. Trends such as decentralization and privatization of services (e.g. advisory services, education and training activities) have contributed to an increasing pluralism of AKIS actors, leaving potential actors clients insufficiently or completely unserved

OVERALL AIM

With the involvement of a diverse range of partners from all 27 EU member states (including ministries, universities, chambers etc.) and spanning over 7 years (2022-2029) the project looks at making the AKIS approach an indispensable and effective tool for all actors of agrifood systems. The project's main objective is to improve AKIS actors' capacities to leverage individual, organizational and systemic resources needed for the transformation towards more coherent and efficient AKIS systems

and the transition towards the sustainable management and use of natural resources in farming and forestry.

MAIN EXPECTED OUTCOME/S

The main outcomes expected include: (i) the provision of a new know-how to be used by policy makers and other AKIS actors, to improve knowledge flows and develop a well-functioning AKIS in their country (ii) supporting Member States' benchmarking in order to choose the most effective AKIS interventions adapted to local/regional/national situations (iii) the provision of approaches to better connect actors, policies, projects and instruments to speed up innovation and the uptake of knowledge.

IMPACT OF RESEARCH

The project will achieve impact through an iterative cycle of collection-organization-delivery of new topical knowledge ready for practice. Key AKIS actors can access this knowledge through the knowledge exchange platform and apply it in their context to achieve better knowledge flows and thus a better functioning AKIS. Knowledge will pertain to AKIS models, strategies, governance solutions, and types of AKIS interventions beneficial to achieving CAP objectives. Network interactions will enable actors to draw on practice-oriented knowledge for integrating advisors and innovation support into the AKIS and incentivizing researchers to deliver practice-ready knowledge. Key AKIS actors in modernAKIS can draw from the comparative analyses of the 27 MS to understand where they can improve their AKIS. Subsequently they can extract and take advantage of new know-how and practices being experimented in AKISs models and strategies applied across the EU from the knowledge exchange platform. The project will enable the capacities of relevant coordinating bodies to monitor, measure and improve the organization/functioning of their AKIS. These activities will help them to identify, share and learn strategies and mechanisms for a well-functioning AKIS. The project provides a forum for such bodes to discuss and exchange knowledge on all aspects of systemic change management.

Scientific impacts include benefits to scientists and practitioners who aim to develop tools/enhance the management practices of complex socio/political ecosystems especially with focus on knowledge management and actor networks. Economic impacts are also expected through reduced access costs to the system for participants (advisors, researchers, farmers, educators etc.). Further, the lessening of informational asymmetry is expected to incentivize the adoption of innovative and cooperative practices benchmarking against better practices may trigger interventions, which provide additional incentives and revenues for advisors, researchers, innovators. Social impacts are also foreseen as the AKIS network will increase awareness, understanding, knowledge and capacities for system change of

key AKIS actors. Long-term improvements in trustful relationships are also expected. Meanwhile by setting up an EU-wide network of key AKIS actors, building on existing networks, projects and policies, modernAKIS will accelerate the uptake of innovative AKIS governance models and interventions as well as of practice-oriented knowledge.

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MED-WET - Sustainable Water Irrigation

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BACKGROUND

The Mediterranean region faces significant water scarcity. High tourist activities during the summer months further stress the limited water reserves, at a disadvantage for agriculture. Additionally, population growth, changing food consumption patterns and climate change are expected to intensify stresses. This calls for more efficient irrigation technologies that are widely applicable. This project, Improving MEDiterranean irrigation and Water supply for smallholder farmers by providing Efficient, low-cost and nature-based Technologies and practices (MED-WET), seeks to enhance irrigation efficiency and to increase freshwater availability by tapping into non-conventional water sources. During this project, three low-cost, lean solutions that optimise natural resource use and income even at small scales shall be explored. The "SLECI" (Self-regulating, Low Energy, Clay based Irrigation) technology is a self-regulating subsurface irrigation technique that uses the suction force of the surrounding soil for regulation of the system's water release via clay tubes. The second technology is a simple desalination system that will be used on saline and low-grade water to recuperate freshwater suitable for crop irrigation. Lastly, productive constructed wetlands will be used for wastewater reuse and its transformation into reclaimed irrigation water. MED-WET has established a consortium of partners with the competence and commitment to meet the requirements of this call. MCAST and the EcoGozo Directorate within the Ministry for Gozo will be joined by the lead partner from Germany (Hochschule Wismar), as well as partners from Egypt (Heliopolis University for Sustainable Development), Morocco (Institut National de la Recherche Agronomique du Maroc and Sultan Moulay Slimane University) and Portugal (University of Beira Interior and Municipality of Fundão) during this 3-year project. MCAST will lead capacity building and dissemination activities to maximise project visibility, accessibility and impact.

OVERALL AIM

MED-WET aims to improve the irrigation efficiency of small farmers in the Mediterranean region and to make optimal use of scarce water resources for lasting food and water security. This will be done, amongst others, by:

1. Developing new irrigation technologies and solutions widely applicable for smallholder farmers.
2. Equipping smallholder farmers with knowledge and skills to install, adapt and operate more efficient and effective irrigation options.
3. Increasing irrigation water availability from salinized and secondary sources.
4. Enhancing farm profitability and environmental footprint of pilot farming practices.

MAIN EXPECTED OUTCOME/S

MED-WET supports smallholder farmers to adopt low-cost, sustainable solutions in irrigation and freshwater harvesting, to promote controlled water use with increased crop yield, to implement agricultural methods that restore ecosystem services for the long term, as well as contribute to value creation in rural areas. Higher water use efficiency shall be reached through more targeted and highly decreased water consumption through innovative irrigation systems and tapping into largely unused non-conventional water resources.

IMPACT OF RESEARCH

MED-WET contributes to combating the adverse effects of climate change on water security, agriculture and food security in the Mediterranean. The project contributes towards the achievement of SDG 6 (clean water and sanitation), more specifically indicator 6.4.1 (change in water-use efficiency over time). MED-WET also contributes directly to SDG 13 (climate action), 1 (zero poverty), 2 (zero hunger) and 12 (responsible consumption and production). MED-WET supports the achievement of the EU Green Deal, including the 'Farm to Fork' Strategy, the Circular Economy Action Plan, and the New EU Strategy on Adaptation to Climate Change. By enabling diversification, promoting regenerative systems with enhanced water efficiency by design, and applying water recovery technologies that provide ecosystem benefits including habitats, MED-WET contributes to the European Biodiversity Strategy and international strategies, such as the UNEP plans on Biodiversity and Agriculture.

The direct impact reaches even beyond the Mediterranean via agrifood value chains reaching all over Europe and North Africa. Throughout the entire project, collaboration between EU and African partners and target stakeholders will facilitate cross-fertilisation of techniques, spanning cutting-edge technologies and sustainable traditional methods. In addition, business development and exploitation activities support each partner to bring their innovations to market, and to launch follow-up research and innovation activities. MED-WET will involve 200 students as researchers (early career, master, PhD), enable partners to disseminate in trade-press, trade-fairs, and conferences. Each of the pilots will also enable the creation of local innovation systems, local incubators of cooperation between science, end-users and finance providers bringing forth new business models for replication and

further experimentation. MED-WET co-develops the local innovation systems in cooperation with end-users, as end-users directly provide inputs on needs, problems and possibilities of the technology under experimentation, and help articulate design specifications, while the field tests provide insights on unexpected side effects of new configurations, promoting real embedded sociotechnical transition.

MED-WET will increase profitability of smallholder farming by enabling them to significantly cut production costs. Enhanced water availability for irrigation and cost reductions resulting in funds freed for investment in the farm enable crop diversification including the cultivation of higher value crops as well as equipment for improved post-harvest handling and increased ability to pay for certifications and other aspects enhancing access to market. MED-WET provides solutions targeted specifically at smallholder farmers in rural areas, thus the benefits of MED-WET for business competitiveness and growth contribute to inclusive rural development.

Project MED-WET funded by the Malta Council for Science and Technology through the PRIMA initiative of Member States, Associated Countries and Participating Countries under grant agreement number PRIMA-2020-02A.

Gigging-4-Living: Supporting creative solutions to sustain artists working in the gig economy

Christine Zerafa[1], Christine Vella[2], Moritz Zavan Stoeckle[2]

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BACKGROUND

The word "gig," now commonly applied to any informal form of paid work was originally specific to musicians. Shorthand for "engagement," a gig was a paid performance in a club or other performance venue: the working musician's bread and butter. It wasn't surprising, therefore, that performing artists were the first to feel the sting of the enhanced community quarantine resulting from Covid-19 outbreaks. Overnight, the entire gig economy, on which their fragile livelihoods depended, collapsed. While writers and painters can continue to create in solitude, the musician's art and that of other performing artists like dancers and actors comes to life only in performance. Not being able to play live has a two-fold negative impact: it hurts the financial livelihood as well as the psychological well-being of the artist. Living with Covid-19 demands that all performing artists really have to get creative and build resilience.

GIGGING-4-LIVING works with adult educators to build business acumen within the performing arts sector. The range of opportunities now open to performing artists to build sustainable careers in their chosen artistic discipline has been profoundly increased by the rapid growth of technology based platforms and social media channels. National and international markets are now open to almost every individual artist on a scale that has only previously available to a very small, select few.

The project is developing a bespoke training curriculum that will have specific modules tailored to the needs of 3 distinct groups, namely Musicians, Dancers, and Actors. The modules will be tailored to suit the needs and address the opportunities for each of these sub-sets of the performing arts sector that still pertain despite the impact of Covid-19. Furthermore, the project will also provide a toolkit of resources that focuses on building resilience to promote positive mental health within the performing arts sector.

OVERALL AIM

The project aims at creating tool-kits for freelance performers in order to build business acumen within the performing arts sector. It aims at supporting performing artists to build sustainable careers in their chosen artistic discipline.

MAIN EXPECTED OUTCOME/S

The project is developing a bespoke training curriculum that will have specific modules tailored to the needs of 3 distinct groups, namely Musicians, Dancers, and Actors. The modules will be tailored to suit the needs and address the opportunities for each of these sub-sets of the performing arts sector that still pertain despite the impact of Covid-19.

RESULTS

A series of tool-kits called Eduzines have already been developed and are currently being tested with freelance performing artists. Following this testing phase, these resources will be made freely available online in MOOC format.

IMPACT OF RESEARCH

The word "gig," now commonly applied to any informal form of paid work was originally specific to musicians. Shorthand for "engagement," a gig was a paid performance in a club or other performance venue: the working musician's bread and butter. It wasn't surprising, therefore, that performing artists were the first to feel the sting of the enhanced community quarantine resulting from Covid-19 outbreaks. Overnight, the entire gig economy, on which their fragile livelihoods depended, collapsed. While writers and painters can continue to create in solitude, the musician's art and that of other performing artists like dancers and actors comes to life only in performance. Not being able to play live has a two-fold negative impact: it hurts the financial livelihood as well as the psychological well-being of the artist. Living with Covid-19 demands that all performing artists really have to get creative and build resilience.

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Erasmus+ *This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein [Project code: 2020-1-IE01-KA227-ADU-082953].*

Mediterranean Island Cleantech Innovation Ecosystem

Gonca Kara[1]

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BACKGROUND

The consortium partners represent the quadruple helix (CUT/MCAST: Academia, OEB/MCCEA/CKIC: Industry, EWA/DMRIDP: Public bodies and CEA: civil society and citizens), will involve all relevant stakeholders in Cyprus and Malta and will work towards the creation of innovation ecosystems that will enable a climate-neutral Europe by 2050. The partners from Cyprus and Malta have already been working on the said topic over the past 5 years and have been advising their respective Competent. In the case of Cyprus, CUT prepared the first such study in Cyprus entitled "Cyprus Regional Cleantech Innovation and Entrepreneurship Hub Study", while CUT/CEA prepared a "Report on the NECP and Recommendation on the Research and Innovation Section" on behalf of the Ministry of Agriculture, Rural Development and Environment. In the case of Malta, EWA drafted the National Strategy for Research and Innovation in the fields of Energy and Water. The development of the Strategy is closely linked to the European drive to expand and further R&I activities, as this is increasingly viewed as a cross-cutting measure necessary to enable Member States realize their national ambitions and the EU, as a whole, to deliver on its overarching objectives. In line with this perspective, the Strategy seeks to further support research and innovation work in energy and water, two areas deemed to be of national importance.

OVERALL AIM

Thus, the overall aim of the MICEI project is for Cyprus and Malta, being small islands with similar needs, barriers and peculiarities, and are being consider 'moderate' and 'modest' innovators, to capitalize (a) on their work up to date and (b) on the experience and the support of EIT Climate-KIC from across Europe ('innovation leaders' and 'strong innovators') to build interconnected and inclusive innovation ecosystems, that will assist them in tackling the innovation gap and in achieving the energy and climate targets set out in the NECP. Overall, it is expected that the Global Cleantech Innovation Index (GCII), Global Competitive Index (GCI) and the European Regional Competitiveness Index of Cyprus and Malta will grow through the proposed cooperation, and will thus improve their standings in the Global Entrepreneurship Monitor (GEM).

MAIN EXPECTED OUTCOME/S

Through the Mediterranean Island Cleantech Innovation Ecosystem (MICIE) project, the partners will:

Identify and analyse existing similar innovation ecosystems worldwide (i.e., the case of Hawaii and Okinawa), drawing from lessons learned in those cases
Connect, through EIT Climate-KIC, with other mature ecosystems across Europe for joint actions
Apply the Systems Innovation Approach for a holistic approach towards the co-creation, co-planning and co-investments for the creation of innovation cleantech ecosystems
Identify, analyse, classify and cluster all relevant local and national actors and engage them through a series of workshops
Write up an action plan for the setting up of joint programmes, that can be used specifically in the case of Cyprus and Malta to stimulate innovation procurement to help the market uptake of innovative solutions. The action plan can also as a template with guiding principles for other areas (i.e. Greek and Spanish Islands, Madagascar, etc.)
Plan and ensure the long-term sustainability of the joint programmes and action plan through collaborations with other funding mechanisms, and Communicate the results of the project, both nationally and at an EU level.

RESULTS

Based on the above, the following Outcomes/KPIs will be:

- Analysis of 4 similar cleantech innovation ecosystems and 10 mature innovation ecosystems worldwide,
- Connection with 4 other ecosystems for joint programmes,
- Involvement and interaction with at least 200 actors from the quadruple helix,
- Identification of at least 10 joint programmes, including their funding sources
- Establishment of 2 action plans, that will assist the Competent Authorities of Cyprus and Malta in achieving the energy and climate targets set out in the NECP
- Dissemination of the project's outcomes to more than 200,000 individuals

Overall, the aim of the Mediterranean Island Cleantech Innovation Ecosystem (MICIE) project is aligned both with the objectives of the call and the needs of the local ecosystems, and the project partners are more able and have the resources to bring this project to a fruitful completion.

IMPACT OF RESEARCH

Raise awareness, knowledge and practical use of legal procedures to implement the practices of innovation procurement
Through the System Innovation Approach, utilizing the EIT Climate-KIC "Visual toolbox for system innovation", and the stakeholder engagement through a series of workshop, all actors of the quadruple helix will be involved in drafting the proposed action plan, which will document the necessary steps for innovation

procurement. Furthermore, through our dissemination activities (social media, public events), we aim to also inform the wider public on this topic.
Leverage capacity building, skills and legal knowledge among public and private buyers.
In order to contribute to this outcome, all sectors of academia, industry and the public sector will be involved with a 1 new Incubator/Accelerator being formed to leverage on the project's main results. It is expected that at least 5 research organisations will support the cleantech innovation ecosystem, 5 banks will uptake and/or fund the joint programmes and 2 investor groups will support the cleantech innovation system.
Explore and scale up the best examples of innovation procurement practices
Through Phase 1 (Benchmarking Pathways) of the project, we will focus on identifying the current state-of-the-art and will focus on best practices benchmarking, which includes but isn't limited to facilitate regional comparisons based on the Global Cleantech Innovation Index (GCII) and generalize the benchmarking approach from European level to worldwide. The Report to be produced will provide wise advice, best practice (and next-practice) to policy makers and practitioners in cleantech ecosystem.
Contribute to the establishment of innovation friendly legal frameworks, and market-oriented procedures.
The final Action Plan will include all aspects of the establishment of a cleantech innovation ecosystem, and a friendly legal framework, and market-oriented procedures are an integral part of such an action plan; - Ensure long-term and sustainable innovation procurement strategies; - Actors from the quadruple helix from both countries are participating in this project (specifically Business Associations and Competent Authorities) and thus they will ensure that the action plan, drafted by them, will be both sustainable and enforceable; - Foster public and private partners' collaboration in the co-design processes to match their needs and identify existing technologies that could result in procurement of innovation.
Through the System Innovation Approach, and the workshops to be conducted in both countries, both public and private partners will be involved in the co-design of the necessary actions/ programmes.

Funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Innovation Council and SMEs Executive Agency (EISMEA). Neither the European Union nor the granting authority can be held responsible for them [Project Code 101070800].

Networking for Excellence in Electric Mobility Operations

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[1]*MCAST Energy Research Group*

BACKGROUND

Hybrid and electric mobility solutions for land and sea are imperative for the Maltese Islands. With the EU-funded NEEMO project, Malta College of Arts, Science and Technology (MCAST) will partner with two leading institutions, namely CEA France, AIT Austria and another urban community member, ANEL Cyprus, to investigate various attributes and challenges associated with e-mobility, such as energy and location management, especially for the Maltese geographical setting. Talented researchers can participate in various events, including meetings, conferences, schools, workshops and exchange programmes. The project will enhance the MCAST Energy profile, reflecting the positive development of Malta's knowledge economy, including its ambition as a regional energy hub, solar country, AI state and maritime hub.

OVERALL AIM

NEEMO aims steadily set in the Electric Mobility research, related integration of technologies, modes and operations within the MCAST Energy research Theme in Transportation from terrestrial to marine mobility and from heavy-duty vehicles to micro-mobility solutions.

MAIN EXPECTED OUTCOME/S

Specific objectives are:

- To enhance and increase the research output of MCAST Energy (in quality and quantity)
- To increase the success of MCAST Energy in grant applications and recruitment of excellent personnel
- To strengthen and develop long-term relations between MCAST Energy, partners, networks and stakeholders

RESULTS

With the help of the TWINNING NEEMO project MCAST Energy:

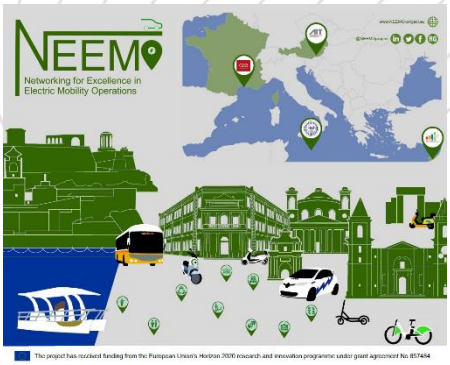
- improved its research profile
- increased the success of grant applications on a National level and recruited excellently personnel
- built strong long-term relations with partners, networks and stakeholders
- increased its international standing, acted as a regional hub, in the field of EVs

IMPACT OF RESEARCH

The potential impacts are to:

- increase dependence on technological innovations by fostering growth in high-tech industries in Malta;
- develop technology and energy solutions for locations that exhibit similar characteristics to Malta but have different needs;
- target Electric Mobility Research where there are clear synergies between academia and enterprises;
- establish a framework to stimulate and identify innovation with the assistance of innovation centres;
- encourage the training of enterprises and policymakers.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 857484.



Funded by the European Union

Upskill professionals and increase job opportunities through Data Visualisation Skills

Gonca Kara[1]

[1]*Applied Research & Innovation Centre*

BACKGROUND

Through the project DATAVISUAL we aim to contribute to addressing some emerging needs, namely:

1. NEW DIGITALVET TRAINING FOR THE "NEW NORMAL". As we enter the COVID-19 recovery phase (the so-called "new normal"), it will be critical to rethink how the Vocational and Educational Training should evolve after the cultural and societal changes brought by Covid-19. More specifically, in the VET sector: a) we need to support teachers and trainers in providing digital solutions (e-learning); b) we need to produce online vocational SPECIFIC material; c) we need to overcome the extra-obstacles to internet access by some groups (e.g. immigrants and low-income families); d) we need to assess and certify new competencies digitally (Open Badges)

2. VET INNOVATION THROUGH E-LEARNING SOLUTIONS VET programmes suffered a double disadvantage because of the pandemic. The combination between social distancing requirements and the closure of enterprises have made practical and work-based learning - so crucial for the success of vocational education - difficult to be implemented. In this context, to develop digital solutions (eLearning) that are able to close the gap between VET and the workplace is necessary more than before. Nevertheless, the digitalisation of VET training courses should not be considered just a solution to overcome the pandemic, but as an opportunity to introduce innovative learning methods in the VET training.

3. FUTURE SKILLS TO HELP EU ECONOMIC AND SOCIETAL RECOVERY One of the effects of digitalisation, through the development of freelance platforms and automated graphic design (e.g. CANVA), has been the increase of the unemployment rate in graphic designers. People who for decades spent their daily time creating visual concepts for companies or communicating ideas that inspire, inform, and captivate consumers, suddenly found themselves out of a job. In this context, Bid Data Visualisation Skills can represent a great opportunity to upskill professionals at work and unemployed graphic designers offering, at the same time, an innovative training opportunity to young people.

4. TO DISSEMINATE EU BIG DATA STRATEGY. Data storytelling accomplishes a more general need from the EU Commission related to the dissemination of the EU Big Data Strategy and its distinctive element related to the fact that European values,

fundamental rights and human beings should represent the core of the Big Data strategy compare to the other global players (China and US).

OVERALL AIM

The project addresses two general objectives and a set of correlated specific objectives: Project outcomes will be clearly related to the specific objectives of the project: General Objective: INNOVATE VET TRAINING THROUGH DIGITAL and INCREASE EMPLOYABILITY Specific objectives: 1.1 DEVELOP INNOVATIVE DIGITAL SKILLS expected outcome during the project: creation of Data visualization best case report and training material for webinars/lessons on data visualization and storytelling expected outcome on project completion: Innovative training (IO2) and research resources (IO1) on big data visualization available to VET institutions and students(from the partnership at first and to be disseminated to larger audiences). 1.2 DEVELOP INNOVATIVE E-LEARNING COURSES FOR VET PROVIDERS expected outcome during the project: the creation of training material for webinars/lessons on data visualization and storytelling immediately available for online teaching expected outcome on project completion: Innovative training materials on big data visualization available to VET institutions (from the partnership at first and to be disseminated for bigger impact later) to set up online courses of data visualization. 1.3 INNOVATE VET TRAINING THROUGH DIGITALISATION AND FUTURE SKILLS expected outcome during the project: creation of Data visualization best case report.

MAIN EXPECTED OUTCOME/S

Project result 1 - Visual Report on Big Data Information Design
Project result 2 - Open Webinars on Big Data Storytelling
Project result 3 - Open Badge Certification System

RESULTS

Project result 1 - Visual Report on Big Data Information Design: The Visual Report on Big Data Information Design is a written and visual account focused on Information Design best examples for Big Data Storytelling and Visualisation. Nowadays, text still prevails despite the growing popularity of data visualization, it's clear that old habits die hard. The aim of the Visual Report is to offer a Learning Material work-based on the best practices of Big Data Storytelling. Indeed, besides the prevalence of text, another problem is that many visual displays are still so poorly designed. The Visual Report will collect outstanding examples of Big Data Information Design in order to offer VET Trainees and Trainers a concrete example of a to-do practice. Each project partner will collect at least 4 best examples of Information Design for Big Data. Project result 2 - Open Webinars on Big Data Storytelling: THE OPEN WEBINARS ON BIG DATA STORYTELLING will be the second

Open Educational Resource (OED) of the DataStorytelling project that consists of an e-learning course to share knowledge about how to Storytell Big Data. The online webinars will focus, at least, on 5 topics: 1) Data Set preparation; 2) Best practices of Information Design; 3) Best practices of Big Data Storytelling; 4) Tools and Digital Platforms for Big Data Visualisation (Tableau, Infogram, etc.); 5) The EU Strategy on Big Data. The open webinars will be developed by project partners also involving external experts (e.g. Information Designers). At least 10 online webinars (1h per webinar) will be provided in a synchro (recorded) learning mode. The activity will be coordinated by MCAST and Fondazione Clerici with the contribution of all project partners. O2 is a preliminary activity for the further implementation of the project and Big Data Storytelling competence open badge certification (O3). Project result 3 - Open Badge Certification System: Open Badges are digital, verified by secure metadata, and a means for individuals to display, and organizations to easily verify certifications, achievements and awards online, including milestones on the way to full certification. Open Badges can be used in email signatures, personal websites, social media sites such as LinkedIn and Twitter, as well as on electronic copies of resumes. The O3 of the project DATAVISUAL will develop an OPEN BADGE CERTIFICATION SYSTEM of Big Data Storytelling competencies based on open badges.

IMPACT OF RESEARCH

- TARGET GROUPS INVOLVED: Trainees (TG1) Trainees (TG2) VET providers (TG3) Disabled people (TG4) Women (TG5) VET Stakeholders (TG6) General Public (TG7) Other participants (TG8)
- SUCCESS RATES

For each Target Group, and related KPI, a success rate expresses in numerical is provided. See the specific section and specific annex for details on indicators related to the impact for more info. Through the use of Multiplier events, Training Module, website of the project, mailing the partnership commits to reach and have an impact on the following internal and external targets. The project will impact at least 30 staff members of the participating organisations. For the participating Vet institutions, the learning material produced will be disseminated to at least 50 students who will be testing the material, to at least 150 students attending other professional training courses and long learning projects provided by the Institutions, their families and the trainers and teachers working there. Furthermore, the involved VET institutions will continue to promote the results of the project even after its end within publications and events and will continue inviting all relevant stakeholders to join discussion and keep on interacting. Moreover, they will also use the project's results for future improvement of its activities.

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Water Efficiency through Site Research & Simulation

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BACKGROUND

BLUE DROP is an R&D project conceived by WES TRADE with the support of its partners MCAST and University of Enna Kore, being two international excellences in the studies related to the apparent water losses and follows up the Feasibility Study successfully delivered to Malta Enterprise in 2020. Objective of the feasibility study was to have a preliminary checkpoint on the input conditions to launch a more complex applied Research programme on the Linkages between Water Distribution Pressure Transients, Water Consumption Profiles, and Water Meter Performance leading to Apparent Water Losses and its possible application to technological systems/products to improve the Water performance and reduce Water losses. The main topic of the R&D project is to investigate on the possible effect of private tanks on the roof of buildings on Apparent Losses, on the water meters deterioration induced by transient flows in water distribution network and the realisation of a modelling software to simulate the topic. After a detailed analysis on the tests performed it was not identified any showstopper to present the final R&D project and the feasibility study was considered successful.

OVERALL AIM

The research in question shall carry out a very detailed study of Apparent Water Losses in both physical mode and in complementary simulated mode, with an aim of closely studying some three pilot zones with highly accurate instrumentation and data resolution, and then repeating and studying these values in a simulated environment. The project shall be implemented over a three-year period to allow for adequate longitudinal depth.

MAIN EXPECTED OUTCOME/S

Water Efficiency Savings

IMPACT OF RESEARCH

Impact on the environment and sustainability

This project is a follow-up of a feasibility study called "BLUE DROP PROJECT" awarded by the Malta Enterprise to WES TRADE Ltd as part of the National Scheme "Research and Development Feasibility Studies 2014-2020".

Empowering Women in Agrifood (EWA)

Vu Thi Phuong Uyen[1], Gonca Kara[1]

[1]*MCAST Applied Research & Innovation Centre*

BACKGROUND

In 2016, women accounted for 28% of the top position s in agricultural and livestock farms in the European Union, with a remarkable low rate amongst women from RIS regions. Therefore, female leadership and entrepreneurial potential are an under-exploited source of economic growth and job creation that should be further developed. Some of the barriers for female entrepreneurs in the sector are obvious barriers to finance, less investment and less volume of money, highly traditional sector, lack of female role models, lack of support networks, lack of confidence as businesswomen, work/life balance and much more. There is a need to find innovative solutions for the problems faced by the food system, empower and raise the qualifications of women with business talent. It is also important to develop businesses at their early stages and create new ones as well as construct links between industry, the academic world, new companies and the community in general.

OVERALL AIM

The programme aims to provide up to 210 women entrepreneurs (10 by country and year) across RIS countries with the required knowledge, confidence, support and networking opportunities to successfully start and develop sustainable businesses. The programme will run for a period of 6 months supporting early-stage female entrepreneurs and it will seek out and assist women to grow and develop their businesses with a tailored, focused approach that specifically takes into account the concrete challenges which female entrepreneurs face generally as well as the barriers which can limit their entrepreneurial activity due to other discriminating factors. CLC NE and CLC South will implement this activity in each EIT RIS target country in cooperation with Local organisations specializing in boosting female entrepreneurship.

Organisations and Female entrepreneurs will be selected through an open call in each of the RIS countries participating in EWA. The programme contains business training, 1:1 mentoring, and networking opportunities. There is also a platform for creating a community of entrepreneurial driven women in agrifood in respective countries and at the European level.

MAIN EXPECTED OUTCOME/S

EWA is a pioneer EIT Food RIS programme that offers 360 support to female entrepreneurs in their local language and addressing barriers they might encounter at the beginning of their entrepreneurial path. The programme includes: FULLY OPERATIONAL VIRTUAL PLATFORM - NETWORKING EVENTS AND WORKSHOPS - MENTORSHIP PROGRAMME -TRAINING - PITCHING AND FOLLOW-UP. Women entrepreneurs will have an opportunity of showcasing the evolution of each of their projects throughout the programme. They will also have the opportunity to pitch and present their projects in front of business investors and win 3 cash prizes of 1,000 EUR.

RESULTS

Nine women entrepreneurs were selected to join the programme in Malta. This trial programme ran from October to December 2022. Mentorship and training services completed and the programme content includes but is not limited to: Resources, Finance and Measuring Impact, E-commerce, Distribution and Retail, Sustainable Agriculture/Farming, Legal and Accounting, Pitching and Networking skills.

IMPACT OF RESEARCH

EWA fundamentally increases the number of upskilled entrepreneurs ready to start businesses in the healthy food, innovation and sustainability field in their regions. This project opens up a window to show women in the agri-food sector and to inspire them, creating economic growth in their regions and societal impact on gender equity matters. EWA´s strategy of providing high-quality business training yet tailored-made to their specific needs and in their local language will allow us to reach new entrepreneurial talents, increase EIT Food and RIS portfolio visibility massively and get more geographical outreach. By reducing some of these entrepreneurial barriers, EWA will support business diversification, rural re-population, and economic growth in those RIS regions. The programme will also create a long-term impact by supporting cultural and business mindset change in the sector and will increase societal readiness for sustainable business creation.

EWA Malta

Co-funded by the European Union

eit Food

TRinE – Telepresence Robots in education

Massimo Pierucci[1], Lisa Theuma[1], Edwin Zammit[1], Lorna Bonnici West[1], Andre Attard[1], Clifford De Raffaele[1]

[1]Applied Research & Innovation Centre

BACKGROUND

In the digital education of the future, there is the vision of seamless virtual and physical access for every home and between each home and the school, as well as its inhabitants such as educators, students and parents. Among the increasing number of available teleteaching tools, the use of telepresence robots (TR) has particular potential. TR can compensate for the lack of mobility of students for various reasons (i.e. distant residency, bad weather conditions, disabilities or illness, force majeure conditions such as epidemics) and enables them to study in a social environment, where they can take an active part in the class on a peer-to-peer basis. The technology also enables distant educators from remote areas or other countries to be present in class. Compared to common teleteaching methods such as video conferencing solutions, the advantages lie in the possibility of actively controlling the robots and thus also occupying the physical space. Telepresence robots thus not only enhance the feeling of social presence but also enable interactions with the environment, that are otherwise impossible.

OVERALL AIM

The project is concerned with the use of telepresence robots in educational institutions at the upper secondary and higher education levels, such as in classrooms and other (e-)learning settings. The main aim of the project is to enable educational institutions, teachers and students in secondary education to draw on the potential of 'on-site' learning via the use of telepresence robots.

MAIN EXPECTED OUTCOME/S

Throughout the course of TRinE, three main outputs are expected: (1) enabling decision-makers to make informed decisions about whether and which TR solutions should be procured at a specific educational institution or even for an entire educational system; (2) providing educational institutions, teachers and students with viable strategies to use TR solutions in a meaningful and effective way as part of their educational efforts; and (3) to make the relevant information on the use of TR accessible to as many educational institutions as possible while promoting exchange about and raising awareness of the opportunities, challenges and limitations of telepresence technologies.

RESULTS

The project is now getting close to its end and the results that will be achieved can be summarised as follow: (1) provision of current, accurate and relevant key data and background information that can serve as a decision basis for educational institutions or educational systems (i.e. decision makers on the verge of deciding for or against acquiring TR solutions for educational use in schools). These materials will cover the state of knowledge on (tele)presence in education, a review of different TR technologies, information on the legal/policy situation, practical applications of TR in education as well as possible benefits and limitations of TR for different actors in the educational sector. (2) Creation of a Didactic Framework for TRinE. In the course of the project, a set of contemporary teaching and learning methods as well as scenarios for using telepresence robots in education will be developed. Didactical, technological, situational as well as social and economic aspects will be taken into consideration for preparing guidelines to support educators in integrating telepresence robots in their educational practice(s). A DIY buying-, building- as well as and operating guide for TR will also be part of this output. (3) Creation of an online TRinE Toolkit in the form of an interactive guidebook. This toolkit will serve as a primary resource for educators, students and other actors within the educational sector that plan to use telepresence robots in education. The development follows an iterative process, including a field test with the participating school in Iceland as well as workshops with stakeholders from different fields of expertise to optimize the toolkit and its materials gradually. The acceptance, as well as the impact of TRinE, will be evaluated using a technology acceptance model involving qualitative and quantitative methods.

IMPACT OF RESEARCH

By carrying out a wide dissemination campaign of the project outputs and results throughout the project lifecycle and beyond, project partners will positively impact students, teachers, parents, stakeholders, decision makers and the general public. This *s*trategic *p*artnership aims to create awareness about the importance of didactic methods, media literacy skills and social competences while using telepresence robots in distance education. Using the interactive guidebook teachers and other professionals will be better equipped when dealing with telepresence robots in different educational settings or subjects.

The analysis of the impact observed during the project will be promoted by the partners within the respective networks.

Through the planned multiplier event in terms of a telepresence conference, the partners have identified the involvement of educators as one of the key aspects and important influencers in the use of the interactive guidebook. Therefore communication with various educators has always been the main focus of all the

partners. These disseminating activities have the aim to enhance educators' digital competencies as well as their confidence in the use of telepresence robots for teaching and learning, possibly resulting in awareness amongst them about the potential of using this educational technology and related educational settings.
The outcomes of this project are likely to facilitate the engagement of students to participate more in the teaching and learning process by interacting with other students or educators via telepresence robots. Moreover, the project is likely to promote inclusion allowing rural students who do not have access to high-quality education to join different educational settings, as well as providing kids who have to stay at home due to illness the opportunity to be present in class and to engage with their peers and teachers.

Erasmus+ *Telepresence Robots in Education, TRinE, is a European Erasmus+ project with agreement number 2020-1-MT01-KA227-SCH-092408. This project is scheduled between March 2021 and February 2023.*

Implementation of the Young Innovators Programme

Sandra Mary Portelli[1]

[1]*MCAST Centre for Learning & Employability*

BACKGROUND

I am a coach for students and teachers who wish to follow the EIT Climate-KIC Young Innovators programme. My research involves further implementation of the programme in my lectures as well as providing training sessions to teachers and lectures from all over Malta.

OVERALL AIM

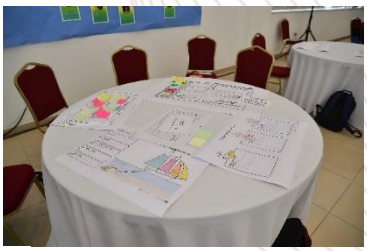
My aim is to see more students from across MCAST and Malta get involved and participate in the second Young Innovators Climathon to be held on the 2nd of December 2022. Also, my aim is to encourage teachers across the Maltese Islands to incorporate the young innovators programme.

MAIN EXPECTED OUTCOME/S

I expect to provide training to teachers and interested MCAST lecturers so that they are introduced to Systems thinking tools and encourage them through my experience with embedding the tools and programme into my schemes to make changes and adaptations to their educational programmes. I expect to train students using the tools to prepare for the 2nd Climathon event.

IMPACT OF RESEARCH

Eventually I would hope that my research impacts curriculum and that the education of Systems Thinking and the Sustainable Development goals becomes standard to primary, secondary and tertiary education. The future of the Maltese Islands and the education of youths is key to us lowering our carbon footprint and keeping Global warming within the 1.5 % increase. For the most part I know that I will be doing my part and that I am already influencing others. I have yet to see the impact of the training I conducted in July and September and the training I am giving to students at the moment. Once the Climathon takes place in December and I continue working with the extra-curricular community group I created on the MCAST campus this year I will be writing a report to summarize the results. Until then I cannot say rippling effects there will be.



eit Climate-KIC

Co-funded by the European Union

MCAST RESEARCH & INNOVATION EXPO 22

A SELECTION OF CONCLUDED EXTERNALLY FUNDED PROJECTS

MCAST

IMPACT: Visualising the microplastic problem

Juan Jose' Bonello[1], Frederick Lia[1], Oriane Georges[2], Marina Beltri[2], Manya Russo[3], Andrew Schembri[3]

1MCAST Institute of Applied Sciences
[2]AquaBioTech Group
[3]Zibel

BACKGROUND

The abundant and global presence of plastic litter in the marine environment reflects the dependency that humans have on plastic in everyday life. So much so that microplastics have been found in the surface water of remote areas, such as the Arctic and the Antarctic. Within the Maltese islands, only a few studies attempted to explain particular aspects of microplastics (e.g., characterisation, distribution, etc.). This clearly shows that there are many knowledge gaps about the implications of microplastics on the local environment. This lack of crucial information goes beyond that, as in the EU report, "A circular economy for plastics", vital information on the impacts that plastics can have on society should also be studied.

OVERALL AIM

Project IMPACT (Identifying Micro Plastic Hotspots in the Maltese WaTers) was launched to identify microplastic hotspots found around the Maltese islands: Malta, Gozo, and Comino, along with characterising this pollutant, thereby filling a vital knowledge gap.

For practical purposes, the main aim can be divided in the following objectives:

- To quantify and characterise microplastics in Maltese waters
- To compile a map of microplastic hotspots in the coastal waters around the Maltese islands
- To disseminate information about microplastics around Malta
- To carry out capacity building of the sampling protocol

MAIN EXPECTED OUTCOME/S

This project gave rise to a number of outcomes that will potentially pave the way to a larger scale study:

- Outcome 1# - An infographic map of microplastic hotspots: This study provided an indication of potential microplastic hotspots in the Maltese waters.

- Outcome 2# - A report highlighting the types of microplastics in the Maltese waters: This study served as a base-line study for the types of microplastics found in one type of environmental matrix.
- Outcome 3# - An awareness raising campaign: Findings were disseminated to all stakeholders and were subsequently involved in the conversation for measures to help mitigate the microplastic content in the marine environment.

RESULTS

The mean microplastic concentration within the Maltese coastal waters was 0.58 (± 0.72) MPs/m3. The concentration ranged from 0.20 (± 0.09) MPs/m3 to 3.35 (± 1.28) MPs/m3. Whilst possible associations with different anthropogenic activities are presented, the heterogenicity of the MPs' distribution and of their concentration levels could be related to several factors.

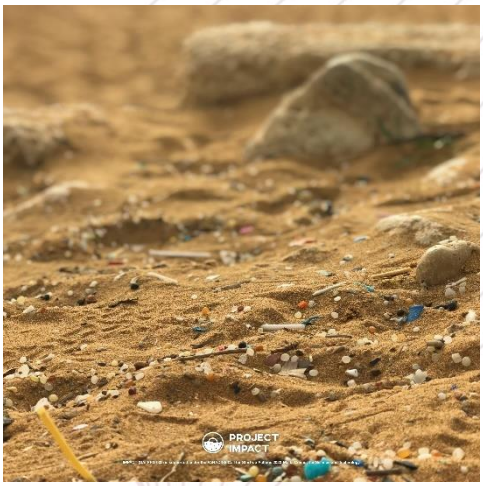
Results show that MP distribution and composition are not homogeneous; there are clear differences between different coastal areas around the Maltese Islands. Such heterogenicity likely reflects a complex interplay between pollution sources, hydrodynamic features such as currents, upwelling and downwelling, as well as the shape of the coastline. In addition, the absence of a standardised sampling and reporting protocol for the identification and quantification levels of MPs on a larger scale hinders the comparison with other areas within the Mediterranean.

IMPACT OF RESEARCH

Project IMPACT aimed to fill an important knowledge gap, that is, information on the nature and distribution of microplastic within Maltese waters. Whilst microplastics do not fall directly within the scope of Directive EUR 2019/904, they are considered specifically in descriptor 10 of the Marine Strategy Framework Directive [10.1.3 "Trends in the amount, distribution, and where possible, composition of micro-particles (in particular micro-plastics)"], and implicitly in the indicator related with impacts of litter on marine life. The project aligned to this indicator providing a comprehensive and systematic picture of the distribution of microplastics. Additionally, the European Union expert group on marine litter (TSG-ML) recommends the development and calibration of monitoring methods, and initiation of Europe wider scale monitoring to commence straight away.

The study's potential is explicitly in line with the 14th UN Sustainable Development Goal (14.1): prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution. It also falls within the Horizon Europe; Mission Starfish 2030 – Restore our Ocean and Waters, not only in the findings of this pilot study, but also in the scale-up potential.

The main aim of this project was to identify microplastic hotspots in the Maltese coastal waters and to characterise the types of plastics that are present. Through this process, knowledge was gathered on the parameters required for measuring and monitoring this pollutant, along with providing a narrative with which to engage key stakeholders, and identification of target sectors and industries.



Aside from providing spatial information about microplastic nature and distribution around the Maltese Islands, this study was also used to trial and develop a monitoring protocol to be replicated and transferred to national stakeholders. The added value of this project addressed the existing knowledge gap on microplastic presence and nature in Maltese waters, as well as engage with industry stakeholders and policy makers along with the enhancement of skills for MCAST students and Zibel's field team and field officers from other NGOs, such as Nature Trust-FEE Malta.

Institutional knowledge and resources possessed by the consortium collectively ensured a high readiness level for commencement of the project, and cost effectiveness by utilising the individual strength of the consortium members. The methodology piloted for collection was found to be the more cost-effective and efficient way to gather microplastics over a large area (IMO, FAO, UNESCO-IOC, UNIDO, WMO, IAEA, UN, UN Environment, UNDP, ISA 2019).

The project also acted as a platform to engage with several other entities, and allow the consortium to scope potential new partnerships to on board – progressing Project IMPACT beyond a start-up action. The project's long-term sustainability will rest with its high potential for scale-up, and with ability for current partner entities to invest their own resources to ensure success.

Xjenza The Malta Council for Science & Technology

IMPACT part/supported under the PARADISE Call for Start-up Actions 2020 - Malta Council for Science and Technology under grant agreement number PRD002.

Successes of Joint Universal activities for Mediterranean PV integration Excellence (JUMP2Excel)

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[1]*MCAST Energy Research Group*

BACKGROUND

JUMP2Excel aimed to step up and stimulate the scientific excellence and innovation capacity of MCAST Energy in the field of PV integration, including related technologies such as energy storage and ancillary services and electricity markets. The joint universal activities of the project together with a group of top world-leading research centres, Centro Nacional de Energia Renovables (CENER) in Spain and Commissariat an l' Energie Atomique et aux Energies Alternatives (CEA) in France together with one of the best research-intensive university The University of Manchester (UNIMAN) in the United Kingdom, providing access to extensive network and contacts in the field. The activities are mainly knowledge transfer and networking through workshops, winter/summer schools, MRes and PhD programmes, internships, exchanges, meetings and mentoring. MCAST Energy experienced self-funding growth within its breath of energy research theme that leads on campus. In addition, the MCAST main campus infrastructure and laboratories were the first 'living laboratories' on the island, used for real-life applications while delivering training and research. This TWINNING project stimulated the required knowledge to become more efficient and competitive to an international level of excellence. JUMP2Excel was designed for all partners to benefit in a way that goes sustainably beyond the three-year funding period. This eventually resulted in enhanced skill sets and profile of MCAST Energy which in turn reflect the positive development of Malta's knowledge economy, including its ambition as a regional energy hub, solar country and blockchain state. The project successfully concluded with 3000+ engagement from the scientific community, industry, civil society, general public and policymakers, 17 journal scientific papers, 19 conference presentations, abstracts and proceedings, 6 public lectures, three conferences, three advanced schools, three workshops and several other actions,

OVERALL AIM

JUMP2Excel aimed to step up and stimulate the scientific excellence and innovation capacity of MCAST Energy in the field of PV integration, including related technologies such as energy storage and ancillary services and electricity markets.

MAIN EXPECTED OUTCOME/S

To achieve this target specific objectives are:

- To enhance and increase the research output of MCAST Energy (in quality and quantity)
- To increase the success of MCAST Energy in grant applications and recruitment of excellent personnel
- To strengthen and develop long-term relations between MCAST Energy, partners, networks and stakeholders
- To increase the international standing of the MCAST Energy, acting as a regional hub, in the field of PV, relevant technologies and electricity markets

RESULTS

With the help of the TWINNING JUMP2Excel project MCAST Energy:

- improved its research profile
- increased the success in grant applications on a National level and recruited excellent personnel
- built strong long-term relations with partners, networks and stakeholders
- increased its international standing, act as a regional hub, in the field of PV, relevant technologies and electricity markets

IMPACT OF RESEARCH

The potential impacts:

- increased dependence on technological innovations by fostering growth in high-tech industries in Malta;
- targeted PV energy integration research where there are clear synergies between academia and enterprises;
- encouraged the training of enterprises and policymakers;
- contribution to reduced CO2 emissions and mitigation of the effects of climate change;
- water-energy nexus benefits from PV integration activities;
- intensify the efforts on the research fields already pursued at MCAST Energy/National Level, by bringing the mentoring and expertise of high-calibre researchers from the advanced partners;
- expand the network and reach of the MCAST Energy.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 810809.

Funded by the European Union

Forecasting Dust Storms over the Mediterranean Sea

Joseph A Zammit[1]

[1]*MCAST Institute Engineering & Transport*

BACKGROUND

Air pollution from particulate matter is a global health problem. Dust particles are considered a source of natural pollutants. Most of the mineral dust particle emission is from the Sahara desert which accounts for 55% of the total emitted dust particles. When dust from the Sahara desert reaches the Maltese islands this results in atmospheric 'haze' which causes problems for people with respiratory conditions, low visibility and lower output from PV panels.

OVERALL AIM

- Predict dust storms over the Mediterranean region originating from the Sahara Desert
- Use Data from the Sentinel 5p TROPOMI Sensor

MAIN EXPECTED OUTCOME/S

- A WRF model to predict to the dust and Aerosol Optical Depth (AOD) of the dust generated and transported from the Sahara desert at a resolution of 1.2km
- Application of the TropOMAER algorithm to extract the AOD from the TROPOMI Sensor
- Application of WRFDA 3DVar in assimilating Satellite Data

IMPACT OF RESEARCH

The aim of AEROTOX is to integrate real time data from the Sentinel 5p satellite to existing modelling software. The fundamental platform used for numerical modelling is Weather Research and Forecast (WRF). A variant WRF-Chem is able to integrate particulate matter with standard weather models. This leads to the forecast of the trajectory of particulate matter through the atmosphere. Through the use of the TROPOMER algorithm and WRFDA a set of predictions are obtained and displayed on a website. The presentation will give an update on the status of the project and the modelling techniques being developed.

Project AEROTOX financed by the Malta Council for Science & Technology, for and on behalf of the Foundation for Science and Technology, through the Space Research Fund under contract number SRF-2019-1S2.

Experiences in the development of an integrated simulation and assessment application for healthcare professionals (the iSADD project)

Neville Schembri[1], Daren Scerri[2], Gerard Said Pullicino[2], Lorna Bonnici West[3], Phyllis Farrugia Abanifi[1], Jonathan Vella[1], Dorianne Cachia[1]

[1]*MCAST Institute of Applied Sciences*
[2]*MCAST Institute of Information and Communication Technology*
[3]*MCAST Applied Research and Innovation Centre*

BACKGROUND

With the continuous progression of the COVID-19 pandemic, healthcare professionals (HCPs) must meticulously follow updated protocols on the appropriate use of control measures, including the appropriate donning (wearing) and doffing (removal and disposal) of personal protective equipment (PPE), designed for the mitigation of transmission risks associated with infectious diseases. To-date, this procedure has relied on traditional methods through following specific written guidelines and visual posters. Whilst these are considered to be evidence based, a major concern is that such methods do not alert the HCPs if they are conducting the process incorrectly. Unintentional breaching of the processes can increase transmission of COVID-19; thus, it is imperative that PPE protocols are strictly adhered to. In line with this concern, it is often argued that the long-term use of PPE under prolonged periods of stress or pressure, such as during the recent pandemic, can lead to complacency, carelessness or a false sense of security and, therefore, lead to protocol breaches such as those relating to face-touching and surface-contact, which are drivers of viral disease transmissions. Furthermore, an issue is also encountered when training healthcare professionals such as nursing and medical students. While, during their training, students are provided with official videos and verbal instructions issued by the relevant infection control authorities on how to wear and remove PPE, once the students perform donning and doffing in practice, they need to rely on the individual educators' observation skills to highlight any incorrect steps.

To this effect a team of researchers from MCAST collectively collaborated on the iSADD research project funded under the Research Excellence Programme (Malta Council for Science and Technology) aimed at developing a prototype PPE evaluation system using Artificial Intelligence to highlight if PPE has been correctly donned and whether the correct sequence was followed during doffing, respectively.

OVERALL AIM

The overall aim of the iSADD project was to build and test an augmented reality technological solution to support both healthcare professionals, educators and students with the correct sequence of donning and doffing PPE. This would be achieved by going beyond existent research, through building and testing an innovative technology which could be the first step towards providing a more attainable solution than the traditional methods of this infection control procedure during a time of crisis and provide an innovative tool which can support HCP educators in providing a simulation environment which goes beyond traditional teaching methods.

MAIN EXPECTED OUTCOME/S

The main expected outcome of the externally funded project was to build and test a final packaged prototype composed of a voice-control system and a PPE evaluation system to provide clear signage and visual alerts informing both experienced and non-experienced HCPs to appropriately wear, remove and dispose of the PPE. Through a series of iterative testing, the research team also sought to explore the perception and acceptability of the final packaged prototype intended at presenting the basis for an innovative tool which can support HCP educators in providing a simulation environment to students which goes beyond traditional teaching methods.

RESULTS

Image processing and machine learning techniques were used to identify articles of PPE as they are worn, and an innovative client server architecture was used to mitigate performance issues given the need for near real time response (NRT). During the application, the user starts the donning process (wearing on of PPE) and if the correct steps are not followed, the user is notified regarding the missed step in the sequence and has the option to begin the process again.

The prototype, which is still part of the experimental proof of concept to determine whether the prototype is valuable, was tested amongst a purposive sample of clinical educators, experienced nurses at Mater Dei Hospital and nursing students from MCAST. Feedback from the various group of participants was very positive and most of the qualified nurses who tested the application expressed that such a solution would have been of great help when they had to start regularly practicing donning and doffing during the COVID 19 pandemic. All students positively engaged with the prototype and reported an enhanced active learning experience, with some students remarking about the reassurance the prototype can provide them with during their practical sessions.

IMPACT OF RESEARCH

The iSADD project has presented an innovative framework which provides both healthcare professionals in a healthcare setting, as well as clinical educators and healthcare students in a classroom setting, with clear signage and visual alerts. It also proved that collaborative working practices between experts from various professional fields can lead to innovative and creative ideas resulting in the adoption of smart learning solutions that can assist in developing further sustainable healthcare delivery by offering faster, more efficient, less polluting ways of training HCPs to adhere to established infection control practices and by reducing urban inequalities through increasing access to learning, so patients can ultimately benefit from more timely and effective care.

The findings of this research project have been featured on local television shows featuring new advances in technology; and also presented at various international conferences on healthcare education.

Project ISADD financed by the Malta Council for Science & Technology, for and on behalf of the Foundation for Science and Technology, through the Research Excellence Programme under grant agreement number REP-2020-013.

Interactions between bottlenose dolphins and small-scale fisheries in Malta

Kimberly Terribile[1], Matthew Laspina[2]

[1]*Centre for Agriculture, Aquatics and Animal Sciences, Institute of Applied Sciences*
[2]*Department of Fisheries and Aquaculture, Ministry for Agriculture, Fisheries, Food and Animal Rights*

BACKGROUND

Fisheries-dolphin interaction has become an issue worldwide because it can affect both the survival of wild dolphin populations and the livelihood of fishers. In the Mediterranean and Black Sea, there are growing interactions between small-scale fisheries and dolphins (mainly common bottlenose dolphins and common dolphins) whereby dolphins are removing catches from nets, referred to as "dolphin depredation" and damaging fishing gear. As well as adding to the risk of entanglement, the resulting loss of income can create conflicts between fishers and dolphins, undermining efforts to improve the conservation of marine mammals and sustainability of fisheries in the region.

This is one of the first national endeavours to compile Local Ecological Knowledge from fishing communities, and it is evident that such knowledge can be a useful tool to obtain the fishers' perception on various marine factors, including the cetacean-fishery interactions. Such an integration of data provides a more holistic picture and allows for bottom-up management. This can subsequently be used in the compilation of regulations and mitigation measures for the sustainability of the fisheries sector and cetaceans alike. The organizations involved in the Malta project are the Department of Fisheries and Aquaculture (DFA) within the Ministry for Agriculture, Fisheries and Animal Rights of Malta and Malta College of Arts, Science and Technology (MCAST).

OVERALL AIM

The aim of this study is to analyse the interactions between cetaceans and small-scale fisheries around the central Mediterranean Maltese Islands through understanding the status of cetacean depredation in Maltese waters and providing mitigation measures if/where cetacean depredation occurs.

MAIN EXPECTED OUTCOME/S

Firstly, it is expected that depredation would be higher in close proximity to fish farms. It is also expected that dolphin depredation would be higher with a particular type of fishery, such as trammel net fisheries. Thirdly, it is expected that mitigation technologies be beneficial, though their extent and duration need to be investigated.

RESULTS

During the first phase of the project, questionnaire results show that 76% of the interviewed fishers claimed a continuous increase in encounters with dolphins particularly in the vicinity of fish farm locations. When asked about the situation over the past 5 years, 12% of fishers believed that the encounter numbers remained roughly the same, 9% did not record any interaction and 3% believed that the frequency of encounters decreased in the past 5 years. Reduction in catches and gear damages (60%) are the most common socio-economic impact related to cetacean depredation, a reality mostly experienced by those using trammel nets. It is interesting to note that despite cetacean entanglement is considered as a risk, no form of entanglement was reported in either of the Mediterranean studies.

During the second phase of this research, trammel nets and pingers (DDD 03x Orange Line and DID 01 Green line) were distributed to Maltese fishers. Onboard observers joined fishers on a regular basis in order to determine the frequency, type and location of the dolphin interactions. Subsequently, pingers were tested with the aim of reducing the damaging depredation interactions on fishing activities. Results show that cetacean depredation is a commonly occurring phenomenon in Maltese waters, and even though the results achieved can be considered to be preliminary, it is clear that these pingers are proving to be effective mitigation measures, at least in the short-term.

IMPACT OF RESEARCH

This study provides a baseline against which to compare depredation activities, giving insights on trammel net fisheries and suggesting improvements that are sustainable both in terms of cetacean population but also in terms of the fishery itself. The results show that pingers are proving to be effective mitigation measures, implying that this added expense for the fisher would reap better catch results, and less economic losses, in the long-term.

This study coincides with a particular time when it seems that cetacean occurrences are on the increase in the central Mediterranean region. The industry could benefit from this study by investigating the appropriateness of the pingers, the durability and the lifetime of the pingers in order to maximise their use. The Government could support this further by subsidising the cost of pingers, or by providing financial incentives to fishers who continue to use pingers in the long term. This study is also impactful since it takes into consideration both the fishers perception, and hence, Local Ecological Knowledge, that was gathered through questionnaires with fishers, as well as through Scientific Knowledge that was gathered through onboard surveys. On a final note, this research is important since it involves collaboration with regional partners in order to be able to share lessons and understand the cetacean depredation and mitigation phenomenon more holistically. In fact, this project was supported by the MAVA Foundation and coordinated by the ACCOBAMS Secretariat, the General Fisheries Commission of the Mediterranean (GFCM) Secretariat, the Regional Activity Center for Specially Protected Areas of the Barcelona Convention (UNEP/MAP - SPA/RAC) and the Low Impact Fishers of Europe Platform (LIFE). All these entities supported research and conservation activities in five countries, including in Malta. As a result, MCAST and DFA researchers were invited to share their results at international conferences, including during the 'Mitigating dolphin depredation in Mediterranean fisheries: joining efforts for strengthening cetacean conservation and sustainable fisheries' event that was held in Catania (Italy) in June 2022, at the 'International Bycatch Meeting' that was held in Malaga (Spain) in October 2022 and at the 'Eighth meeting of the parties to ACCOBAMS' that was held in Malta in November 2022.

This project was supported by the MAVA Foundation and coordinated by the ACCOBAMS Secretariat, the General Fisheries Commission of the Mediterranean (GFCM) Secretariat, the Regional Activity Center for Specially Protected Areas of the Barcelona Convention (UNEP/MAP - SPA/RAC) and the Low Impact Fishers of Europe Platform (LIFE)

MCAST
RESEARCH & INNOVATION
EXPO 22

A SELECTION OF INTERNALLY FUNDED PROJECTS

MCAST

Simone Weil: Performance through nothingness

Tyrone Grima[1]

[1]*MCAST Institute of Creative Arts*

BACKGROUND

This project is linked to three other research projects. The first one was held in the second semester of the academic year 2019-20, which presented a theoretical framework for theatre making based on the spirituality and the philosophy of Simone Weil; the second one was a series of workshops based on the theoretical framework, held in the first semester of the academic year 2020-21; and the third one was a one-person performance, stemming out of the same framework, presented in the second semester of the academic year 2020-21. In this project a book will be published, bringing together the three phases of the project Simone Weil: Performance through nothingness and presenting further material and development on the subject.

OVERALL AIM

This project will present a modus operandi of how the spirituality and philosophy of the French mystic Simone Weil could be used to devise theatrical performances in a fresh and engaging manner,

IMPACT OF RESEARCH

The book will provide a framework which could be adopted and adapted by other theatre practitioners in Malta.

The Perception of PE Secondary School Teachers about the role of PE in promoting Mental Health and Wellbeing

Anna Maria Gatt[1], Kyriaki Makopoulou[2]

[1]*MCAST Institute of Community Services*
[2]*University of Birmingham School of Sport, Exercise and Rehabilitation Sciences*

BACKGROUND

In response to growing concerns over mental health issues reported by a growing number of children and young people, schools are increasingly recognised to provide an appropriate setting in promoting positive Mental Health and Wellbeing (MHW) for all (Garcia-Carrion et al., 2019). Yet, PE is currently overlooked as a MHW intervention setting; and there is little understanding of how this can be achieved.

OVERALL AIM

To address this gap, the present study was designed to examine PE teachers' experiences and perceptions on whether and how PE can provide positive MHW. Apart from perceptions, PE teachers reflected on their current practices and whether they address MHW.

RESULTS

Preliminary analysis of the data suggests that PE teachers had overall positive perceptions about their role – and the role of PE – in promoting positive MHW. For these teachers, an effective inclusive pedagogy, with a focus on developing young people's life skills through PE, can afford positive overall movement experiences and can contribute to the promotion of positive MHW for all. They also felt that PE offers a casual environment in which mutual and trusted interactions can be developed between teachers and students, and amongst students themselves. This environment, alongside the flexibility afforded to teachers in terms of anticipated outcomes (and reduced pressure on academic results), provides the right context for PE teachers to identify and, eventually (optimistically), address students' individual needs and preferences. Currently, the restrictive content in the PE syllabus and the lack of awareness regarding MHW issues amongst the teaching profession were identified as the main barriers by these PE teachers, who also argued that these barriers demand appropriate continuous professional learning / education.

IMPACT OF RESEARCH

Having established that these PE teachers saw PE as playing a central role in schools in promoting positive MHW for all students, further research is required in developing a better understanding of the kind of knowledge and support PE teachers need in addressing this important issue. In the context of the present

study, building upon finding from this first stage of the research, the next step is to develop, implement and evaluate a novel pedagogical approach incorporating mental skills training as a tool to promote positive MHW. The programme will be co-constructed and evaluated with PE teachers and pupils aiming at understanding whether and how implementing Mental Skills training in PE can lead to a meaningful experience that equips students with life, carry-over skills applicable to different contexts. The programme will be developed based on the current Learning Outcomes Framework used in secondary schools, focusing mainly on two areas: Fitness (as an Individual Sport area) and Games (as a Team Sport area). Together with the students, the researcher will design the programme taking in consideration their needs and preferences. Students who will be involved in the co-construction of this programme will develop research skills which will then be useful in other contexts outside school. Once the implementation of the programme is over, an evaluation session will be carried out with a group of PE teachers as part of their PD. The research conducted by Ms Anna Maria Gatt is supported by the Tertiary Education Scholarship Scheme (TESS). The Tertiary Education Scholarships Scheme financed by the Ministry for Education, Sport, Youth, Research and Innovation, Malta.

Implementing augmented reality technology in teaching human anatomy: An educator's autoethnography

Cassandra Sturgeon Delia[1]

[1]*MCAST Centre for Learning & Employability*

BACKGROUND

Augmented reality (AR) is a technology that uses a digital overlay to create an enhanced version of reality in the real world through a wide array of devices, including mobile applications (Chiang, Shang & Qiao, 2022; Dreimane & Daniela, 2021). This technology is helpful in many disciplines, including education, to reach student learning outcomes through realistic and perceptive sensory experiences (Karagozlu, 2017). Over the past years, there has been an increased interest in technology-enhanced learning. Although there has been much research effort to understand better the challenges and difficulties that educators face when implementing technology in their classrooms, in literature, there is a lack of holistic accounts of how educators learn and use new technology for teaching, through which how their long-held pedagogical perspectives are challenged and changed. This autoethnographic inquiry explores an educator's learning experiences of implementing AR technology to teach human anatomy to lower-level students in a vocational education setting.

OVERALL AIM

This study explores an educator's journey towards learning by utilising Mezirow's Transformative Learning Theory and autoethnography as a medium to self-examine the individualistic experience of implementing AR as a teaching tool in order to determine a personal transformation.

MAIN EXPECTED OUTCOME/S

Although this study seeks a transformative learning process, my path is not set in stone, and autoethnography is far from a straightforward undertaking. Hence, I cannot predict whether I will reach transformational learner status after the study, however, the cultural knowledge generated, whether it is what is expected or not, will still contribute to educational research.

IMPACT OF RESEARCH

Within educational research, holistic accounts of educators' making sense of their challenges in implementing new technologies to teach and how their long-held pedagogical perspectives change through transformative learning have much value. To date, within the realm of technology-enhanced learning, little has been written about the educator's transformative account from a transformative lens. Thus this

study can offer educators support and guidance through a holistic journey of how educators learn to use unfamiliar technology for teaching.

A semantic real-time activity recognition system for sequential procedures in vocational learning

Daren Scerri[1]

[1]*MCAST Institute of Information & Communication Technology*

BACKGROUND

In various areas of study, standard established procedures are critical for the successful accomplishment of a kinaesthetic task. Such standard procedures are important in various industries like engineering and health. This study makes a case for the development of intelligent activity monitoring systems for learning purposes through a proof of concept in first-aid training. Minor accidents such as simple cuts, bruises and minor burns are frequently treated without the need of emergency medical services. However, an incorrect first-aid procedure may lead to medical complications.

OVERALL AIM

This study aims to aid a learner to train how to perform a first-aid procedure for treating a wound through real-time monitoring, instructions and feedback. We propose a three-phase system where fast object detection, activity recognition in a temporal dimension and sequencing are used to semantically understand leaner actions.

MAIN EXPECTED OUTCOME/S

The You Only Look Once (YOLOv5) was used in phase 1 to detect multiple objects like wounds and bandages and Mediapipe to detect hand landmarks. Each class was assigned a different threshold for more accurate detections. Object detection was used to detect first-aid elements which are required to conduct action recognition and different confidence thresholds were assigned for each class. The outcome of phase 1 detections were then fed to a semantic network of actions (phase 2) with the expected outcome being detection of actions that take place over time. The sequence of the actions in a procedure, is then retrieved from a CSV file and stored, thus enabling the modification of the prompted sequence without requiring programming skills. Type I, II and III experiments were then conducted to evaluate success. I.e. when a correct sequence was conducted (Type I), swapping around actions (Type II) and when introducing 'noise' (Type III).

RESULTS

The object detection model achieved a mean Average Precision (mAP) of 72.74% on the validation set and was subsequently used in a temporal manner to recognize an action. This temporal method to recognize the action of applying pressure over a wound, achieved an F1-Score of 91.67%. The method using an ontology-based

technique to recognize the action of applying a bandage, achieved an F1-Score of 90.91%. The optimum distance from camera was found to be the actor placed at a position where the arm of the wounded actor occupies a significant portion of the viewport, whilst the optimum camera angle was found to be 110°. The created sequencing algorithm was tested using three different scenarios with the aid of a number of participants. The overall accuracy was 83.33%, wherein the result highlights that the algorithm is able to identify the sequence being conducted even with minimal movement involved during bandage application. The proposed system has high prospects of addressing challenges in a real-world environment.

IMPACT OF RESEARCH

In this study, a solution to detect the sequence of actions in a first-aid procedure for a wound was developed and tested. A custom dataset was created through publicly available sources and manually taken videos which were later converted to images. A total of 734 images for training and 183 images for testing were gathered for the classes which are within the scope of this study, allowing a model to be trained successfully with a mAP of 72.74%. The proposed algorithm that uses the temporal dimension to recognize an action achieved an F1-score of 91.67% while the algorithm that uses an ontology-based approach achieved an accuracy of 90.91%. These scores show that detecting instances of an action over a number of frames and checking the intersection between objects over time to determine an action are both suitable for real-time activity recognition. Moreover, when compared to other state-of-the-art studies, it was found that the proposed methods achieved similar results with less processing overload, a much smaller dataset and inexpensive equipment. For best results, the optimum camera angle and distance from the camera were investigated, with camera focused on the whole arm, at an angle of 110° was the ideal setup. The sequencing algorithm achieved an accuracy score of 83.33%. The algorithm was successfully able to determine whenever a sequence of actions was conducted correctly or otherwise. Elements of uncertainty were also introduced when testing the sequencing algorithm where it was found that extreme movement can cause the sequence to fail. Given the above results achieved in our particularly challenging first-aid training scenario, we foresee that by enriching the ontology of actions our solution can be easily and effectively extended to include other hands-on tasks, learning activities and fields of study. Future work could be carried out to implement a sequencing functionality where the order of the steps can be modified by the user as needed to build new sequences. Given the limited number of images that could be gathered from publicly available sources, it is suggested that a larger dataset is built with a greater variety of wounds and bandages. Moreover, an ecosystem of actions can be created where individuals can contribute to the dataset instead of having a standard set of actions. In doing so, the

dataset is constantly enriched through multiple sources which could lead to creating a dynamic framework that is always learning.

Experiment design of a payload for a sub-orbital rocket to study spacecraft repair after space debris impacts

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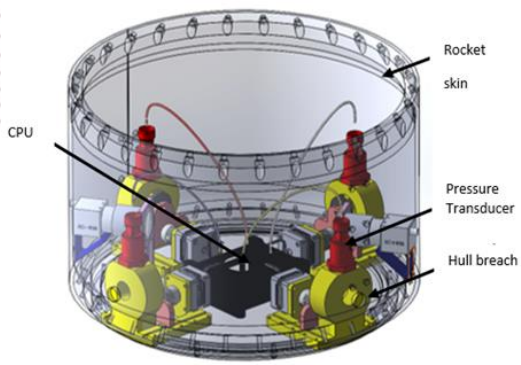
BACKGROUND

The research described proposes the investigation into the cold-welding phenomenon for use in spacecraft shield repair following a hypervelocity impact due to space debris. The onboard test rig, custom patch design and the actuation methods described can be tested and qualified, at TRL 4, onboard a sub-orbital flight sounding rocket.

Similar metallic materials will fuse or weld when they come into contact and undergo relative displacements under certain conditions. The inability of the surface contacts to re-oxide after abrasive contact is inhibited in the space environment, as a consequence atomic diffusion of the metal occurs and causes fusion. It has been demonstrated that, even under terrestrial conditions, the action of a low fretting load can nearly double the adhesion force under cyclic loading.

OVERALL AIM

In Space, cold welding was first analysed in the '80s as an adverse reaction, causing failures of mechanisms. In situations after hypervelocity impacts due to Micrometeoroids and Orbital Debris (MMOD) on a spacecraft or indeed fatigue failures, shield perforation or breaches may occur. In-situ repair from inside the vehicle is preferable due to the pressure differences. One potential solution is the



use of "self-healing" properties of materials such as thiol-ene-trialkyl borane, nevertheless, these techniques present some limitations.

MAIN EXPECTED OUTCOME/S

Evaluating a paradigm shift in cold-welding adhesion, this project aims at developing a test apparatus to apply a custom Indium patch and investigate its adhesion properties during re-entry under a range of mechanical application conditions. For evaluation purposes, four different types of chambers can be tested and monitored using pressure sensors. The recovery of the payload will allow the metallurgical analysis of the cold-welded joint.

After the phase of ground development and validation phase using a vacuum chamber the core of the activity is the design and testing of the experimental setup to be integrated into the payload of the sounding rocket.

RESULTS

The testing rig will be able to simulate the hull breach in terms of crack and opening, and capable of applying the repair and monitoring its performance during re-entry after the sub-orbital flight.

IMPACT OF RESEARCH

The Aerospace, Mechanical and Electronic Department at South East Technological University (SETU), Ireland, and the Department of Aviation at the Malta College of Arts, Science & Technology (MCAST), Malta, are collaborating with the Centre of Studies and Activities for Space (CISAS) “G. Colombo” of the University of Padova, Italy for the second phase of this research project.

COVID-19 diagnosis as a teachable moment for smoking cessation: a randomised controlled feasibility study

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BACKGROUND

Tobacco use is one of the most important preventable causes of disease and premature death in the world. Tobacco use, such as smoking, causes damage in nearly every organ system in the human body, increasing the risk of tobacco-associated diseases, and even death (Drope & Schluger, 2018). Many smokers want to quit, however most do not succeed on their own. Health care professionals can encourage smokers to quit smoking in view of their current health or social situation, and provide or refer them to specialized support (ENSP, 2020).

Increasing evidence suggests that certain health-related events, such as a respiratory disease diagnosis (Jones, 2017), lung cancer screening (Piñeiro et al., 2016), and lung cancer diagnosis (Puleo et al., 2021), amongst others, can also help increase smoking cessation success. These health-related events, often described as "teachable moments", can prompt individuals to adopt risk-reducing behaviors with the intention to improve their health or reduce their risk of complications (McBride et al., 2003).

Given the current context, the COVID-19 pandemic, a COVID-19 diagnosis, an acute respiratory disease, may thus also proof to be a "teachable moment", possibly prompting the individual to reduce or quit smoking. While such a diagnosis may be associated with spontaneous cessation on its own, health care professionals can make opportune of such a health-related event by providing smoking cessation support amongst such individuals for improving their chance of smoking cessation success.

OVERALL AIM

The aim of this pilot experimental study was to assess the feasibility and acceptability of a telephone-based smoking cessation intervention for individuals who test positive for COVID-19.

Eighty smokers who were diagnosed with COVID-19 at Pembroke testing centre in Malta between March and April 2022 were recruited and randomly assigned to the intervention or to the control group (no intervention). Smoking habits were assessed and compared at one- and three-months follow-up (intention-to-treat analyses). Participants who were assigned to the intervention group were also asked about their satisfaction with, and perceived usefulness of the intervention.

MAIN EXPECTED OUTCOME/S

It was expected that more participants in the intervention group would attempt to quit smoking and succeed in quitting, remaining abstinent from smoking at one- and three-months follow-up. Furthermore, it was expected that generally the participants in the intervention group would be satisfied with the smoking cessation support provided, finding it also useful.

RESULTS

Most participants were female (n=47, 58.8%), with a secondary level of education (n=40, 50.0%), and employed (n=57, 71.3%). The mean number of cigarettes smoked per day was 12.6 (SD 9.22). The median time before having the first cigarette was 30 minutes. There were no significant differences between the demographic characteristics and smoking habits of the participants in the intervention and control group.

Out of the 40 participants recruited to the intervention group, 10 refused smoking cessation support. Most participants received two (n=11) or three (n=11) telephone-based smoking cessation support sessions. Three participants dropped out while being supported in quitting.

Following COVID-19 diagnosis, more participants in the intervention group than in the control group attempted to quit smoking (69.4% vs. 30.6%, p=0.002). While nine participants in the intervention group and five participants in the control group quit smoking (reporting at least seven days smoking abstinence), this was not significant. Five and three participants from the intervention group versus three and four participants from the control group reported being abstinent at one- and three-months follow-up, respectively. Two participants from the control group reported getting pregnant, and for so stopping smoking, during the study period.

Out of the participants who accepted to be provided with smoking cessation support, only 12 (40%) filled in the questionnaire. All participants were very satisfied or satisfied of having been asked about their smoking habits, advised to quit, and offered telephone-based smoking cessation support. Furthermore, they were also very satisfied or satisfied with the smoking cessation support provided.

All participants also strongly agreed or agreed that the smoking cessation support was provided at the right time and that it met their expectations. On being asked for suggestions for improvement, none of the respondents (n=7) provided any suggestions, but rather stated that they were happy with the intervention.

IMPACT OF RESEARCH

This study suggests that smoking cessation advice in view of an acute respiratory infection such as COVID-19 can indeed trigger individuals who smoke to attempt to quit smoking and accept smoking cessation support. Health care professionals in

Malta should therefore take opportune of their patients' current respiratory health situations to encourage smokers to quit smoking or to refer them to specialized support.

Given the positive feedback on the smoking cessation support provided at the time of the COVID-19 diagnosis, further research on this subject area is required. Future studies should explore the smoking cessation experiences of these individuals, exploring the facilitators and barriers towards quitting for a better understanding of the effectiveness of the provided intervention.

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The Mental Health Needs of 16 to 18 year old Students in Level 1 to 3 Vocational Education in Malta

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BACKGROUND

Mental and behavioural problems are increasing among adolescents in Europe. Approximately half of these start before or during adolescence, affecting around 20% of European adolescents. Educational, health and social institutions often fail to see emerging symptoms of these conditions, with significant life-long negative repercussions for children and adolescents' development and mental health (WHO Regional Office for Europe, 2018). Additionally, empirical evidence related to the prevalence of mental health conditions among post-secondary students is lacking locally.

Depression and anxiety disorders are the most common mental disorders experienced between 10 and 19 years. They are one of the top five factors causing overall disease burden in terms of disability-adjusted life years (WHO Regional Office for Europe, 2018). Depressive symptoms in adolescence are linked to suicide ideation and risk, future physical and mental illness, unemployment (Chabrol et al., 2007; Thapar et al., 2012; Henje Blom et al., 2016) and self-harm (Sho et al., 2009). Eating disorders (EDs) are also increasing in prevalence and the third most common chronic condition among adolescents is Anorexia Nervosa (AN). It is severe, has poor outcomes and elevated mortality rates (Arcelus et al., 2011).

Educational institutions, being in an ideal position to do so, need to go beyond driving students towards academic achievement towards also fostering their wellbeing and health (Dhuria et al., 2009; Institute of Medicine [IOM], 2009; Carroll et al., 2012; Connors et al., 2019; Doan et al., 2020; Szlyk, 2020b; Cefai, Simões, et al., 2021). This is especially relevant considering the increase in mental health difficulties observed among adolescents during the Covid-19 pandemic (Cortina et al., 2021).

OVERALL AIM

This study aims to understand the mental health needs of 16 to 18 year old students following Level 1 to 3 courses within post-secondary vocational education in Malta and Gozo, by identifying the prevalence of depression, stress, anxiety, eating disorders and Health Related Quality of Life (HRQOL) among MCAST students. The study also aims to identify factors hindering and supporting students' mental health and outline ways of how their mental health needs can be met within College.

MAIN EXPECTED OUTCOME/S

It was hypothesized that since students in lower VET levels have obtained few academic qualifications they may be more vulnerable to mental health difficulties. It was also hypothesized that students' mental well-being and their Health Related Quality of Life (HRQOL) will be lower than reported in pre-pandemic European and international studies.

RESULTS

64.4% of students were found to be struggling with at least one of the mental health conditions assessed. 36.7% of students reported a suspected Eating Disorder. Prevalence of depression, anxiety and stress corresponding to a moderate, severe or extremely severe section of the population were 43.3%, 48.8% and 29.3% respectively. Students had a lower HRQOL than the reference population indicated by European norm data.

Risk factors identified include female gender, poverty, belonging to a sexual minority group, not living with both parents, past negative school experiences, particularly bullying, difficult relationships with others and presence of suspected or diagnosed conditions or disabilities, among others. 13.5% of students have used mental health services.

77.9% of students reported that their MCAST experience was good or very good. Suggestions given by students as to how they can be supported better in college included having increased care and individual attention, and less assignment stress, particularly conflicting deadlines, among others.

IMPACT OF RESEARCH

Research evidence with this age group is lacking within the local scenario and seeing that approximately 50% of mental health conditions start by 14 years of age (Kessler et al., 2007, reporting on the study carried out on behalf of The WHO World Mental Health Survey Consortium), I believe that this area is of utmost concern to educational institutions working with adolescents. Such research can enable Educational institutions to identify whether students need support, understand who vulnerable students are, promote resilience among all students, identify, and eventually provide the necessary support strategies.

Post-secondary education is a critical stage in lifelong education. 86% of students in Malta and Gozo who finish compulsory education start post-secondary education, however 44% do not subsequently advance to tertiary education (The Working Group on the Future of Post-Secondary Education in Malta, 2017). Such scenarios are evident also in other European countries, such as the Netherlands, where 75% of all school drop-outs occur in post-secondary VET (Dutch Ministry of Education Culture and Science, 2011, as cited in Bannink et al., 2015).

At MCAST 1770 students dropped out of their courses between 2017 and 2020, with a decrease noted between these years. Significantly more males dropped out than females (Torou et al., 2022). Torou et al. (2022) report that psychological stress was one of the factors contributing to this rate of drop-out. Indeed students who have mental health conditions are more likely to terminate post-secondary education prior to completion (Hjorth et al., 2016; Lee et al., 2009) and depressive symptoms are linked to drop-out (Bannink et al., 2015; Dupéré et al., 2018). Dhuria et al. (2009) also report a correlation between students' low grades in school and mental health problems.

Following these findings it is hypothesised that mental health difficulties may be one of the reasons for drop-out at this age in Malta. School-based interventions aimed at improving socioemotional outcomes also improve academic outcomes (IOM et al., 2009), so it is hoped that understanding these students' difficulties may help suggest interventions that improve well-being, reduce drop-out and improve academic achievement, in line with the goals outlined in the Framework for The Education Strategy for Malta 2014-2024 (Ministry for Education and Employment, 2014). Having students who advance in their studies not only benefits their personal development but is also beneficial to the Maltese society, the industry as well as the country's economy.

Recognition of Underutilised Maltese Marine Species

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[2]*Institute of Applied Sciences*
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BACKGROUND

The biogeographic location of the Maltese islands at the centre of the Mediterranean Sea acts as a sink for marine species that exist both in the Western and Eastern Mediterranean regions. Despite the insularity of the country, consumption focuses mainly on mainstream marine species such as Bluefin tuna and seabass. Globally, the ever persistent overuse of mainstream marine species is resulting in tighter species quotas and supply shortages, consequently causing major difficulties for both fishermen and seafood processors. This, therefore, calls for responsible consumerism, with underutilised marine species assuming a new importance. Locally, while there exists a list of the most commonly consumed species, a list of underutilized marine species is still being compiled. It is, therefore, necessary to identify underutilized marine species and assess their current status in order to exploit such resources as substitutes of vulnerable, threatened and over-exploited species, through cost-effective technologies.

This research aims to create the basis for the promotion of underutilised marine species through an innovative approach that incorporates the use of Artificial Intelligence to solve and mitigate real-life concerns. This falls directly in line with MCAST Artificial Intelligence Strategy. In the last few years, MCAST has embarked on developing a strategy towards exploiting and integrated AI into MCAST's core functions.

OVERALL AIM

This study aims to utilise computer vision based machine learning to assist in the correct identification of underutilized marine species, for increased consumer awareness and nutritional education amongst people residing on the Maltese Islands. This is carried out through inter-institute collaboration, involvement of specific sectors of the public and Department of Fisheries and Aquaculture collaboration.

MAIN EXPECTED OUTCOME/S

Integrating AI within the public's utilisation of fish would facilitate and enrich the knowledge in decisions about our food consumption and preferences. A novel dataset of photographic and nutritional data, together with annotations and labels of a sample of underutilised marine species in the Maltese Islands will be conceptualised through collaboration with a purpose sample of relevant

stakeholders. Hence, the project will aid in the recognition and promotion of underutilised fish.

RESULTS

This research has identified 23 underutilised fish species. The data collection of a few species has also started and a number of AI models have been created to identify any challenges with the following observations being made: under-represented species are not being recognised properly, thus more photos are needed to be gathered; images should contain singular instances of the subject species; similar species need to be represented more in order for the model to be able to distinguish between them.

IMPACT OF RESEARCH

- The scientific field

1. The ever-persistent demand and over-exploitation of mainstream marine species is resulting in tighter species quotas and supply shortages, which in turn are causing major difficulties for both fishermen and seafood processors. Impact: Understanding the factors hindering consumption of underutilized marine species can lead to a disciplinary advancement in the fisheries sphere by being a stepping-stone towards increasing the use of these marine species and, hence, enhancing our coastal sustainability.
2. The fishing market and the catering industry focuses on species which are in high demand. Impact: The proposed AI platform will be listing underutilised species and, as a result, if found to be acceptable and applicable by participants, the platform can be exploited further to research its use as a marketing opportunity, thus, also supporting the advancement of the fishing market industry. It can also be exploited by the catering industry, as enhancement of the use of these marine species can provide the opportunities to chefs to create new innovative culinary concepts.

- The society

Food sustainability requires the promotion of inclusion of underutilized marine species. Impact: This could be the first step towards the development of an AI platform which supports recognition of underutilized marine species and promotes their use. Exploitation of results can, therefore, have a positive impact on consumers who will have an opportunity to widen their choice of local products for consumption purposes. In addition, the consumer will be provided with the associated nutritional value.

The public may not be in a position to recognize underutilized marine species, and if it does, efforts are singled out mainly among few hobbyists. Impact: Given that the public will be engaged to collaborate in the project by providing photographic

evidence of underutilised species, by involving the public as part of a scientific research endeavour, this researcher reaches the aims of citizen science.

- This research can also impact the educational sphere.

Currently, students who pursue education revolving around marine species, are limited to images of underutilized fish except during practical sessions when, depending on the season and availability in the market, live specimen are used. Impact: Exploitation of the AI platform emerging from this research can be used for education purposes, particularly for students following biology, aquaculture or fisheries related courses. The platform can be extended to provide scientific nomenclature, both in the form of a classified species, but also in the form of a label with common terminology in English and in Maltese.

This research, therefore, goes beyond the adoption of traditional exploration, educational and promotional tools by integrating the perspectives and skills of the environmental, fish, nutrition and information technology sciences. It also integrates AI information with marine species and nutritional information into one AI platform concept in order to advance the fundamental understanding of a possible solution to promote underutilized marine species, thus, strengthening the input required for the successful completion of this research through interdisciplinary collaboration. This collaboration also strengthens the links with other stakeholders engaged through this research.

Undergraduate Nursing Education - Well-Being Support Throughout the Clinical Placement

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BACKGROUND

Nursing is a practice-based profession. This means that clinical education is an essential part of the undergraduate nursing education curriculum. The quality of nurse education depends largely on the quality of the clinical experience. Students require effective clinical placements to allow the application of theory to practice. These experiences are central to the student's preparation for entering the workforce as a competent and independent practitioner. There is an increasing demand to support undergraduate nursing students during their clinical placement within all healthcare settings. A clinical placement has the potential to provide multiple learning opportunities for nursing students and relate theory to practice. However, there remains a need to understand holistically nursing students' experiences of clinical placement and how these affect their well-being throughout their undergraduate nursing education journey.

OVERALL AIM

The main scope of this research was to explore the nursing student's perception of MCAST well-being support pre, during, and after the clinical placement. This is planned to serve as a basis to create a future support mechanism for nursing students throughout their learning trajectory during the clinical component of the course.

MAIN EXPECTED OUTCOME/S

Conclusions: Nursing students encountered negative and positive experiences. Both experiences confirmed that clinical settings provide valuable learning opportunities for nursing students which at times can be challenging. The results show the utmost importance for organizations to establish effective methods that fully support and prepare nursing students throughout clinical placement. When asked to recommend means and ways of support, the participants recommended more one-to-one meetings, group discussions, easier transition into clinical placement, mental health support, coping strategies, counselling services, and follow-up following placement.

RESULTS

This research exercise was conducted between April and May 2022 and involved current nursing students from the Northumbria University Bachelor of Science (Honours) in Nursing Studies. This means that Students from cohorts 3, 4, and 5

were invited. Method: An exploratory and descriptive research design was used through the dissemination of a questionnaire comprising of closed and open-ended was used. The questionnaire was disseminated to all eligible nursing students through JISC online surveys. Participation was voluntary and research was built upon the ethical principles of anonymity, confidentiality, beneficence, and non-maleficence. A total of 29 students made up 26% of the whole eligible population. Content analysis was used to analyse collected data.
Results: 59% (n=17) of the participants were aware of student support services at MCAST with the majority mentioning counselling, career guidance and extra lessons as known services. 39% (n=11) indicated that they made use of available student support services. When asked if the nursing course supports you before, during, and after placement, 75% (n=21) of the participants answered 'Yes' and mentioned pre-placement preparation, explanation of the reality of nursing, availability of lecturers and post-placement reflections as means of support.
The participants mentioned that challenges and problems during the clinical placements were related to day-by-activity, interpersonal and professional relationships, abuse, challenging behaviour, and emotional disturbances such as death and dying, CPR, and caring for the terminally ill.

IMPACT OF RESEARCH

Implications from this research include appointing a support professional specifically for the supervision of nursing students, re-inclusion of the personal tutor, increased tutor support throughout the clinical placement, improvement of well-being services in relation to nursing education, and improvement in the availability of resources. This research contributes to awareness of how nursing students live their clinical placement and how lecturers and support services can support them. The study's recommendations can guide professional nurses, nurse educators, support services, and healthcare workers to support nursing students.

Creating a deeper and practical collaboration with Malta's National TV Broadcaster

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BACKGROUND

Malta's National Broadcasters at PBS want to rejuvenate their work force and creative media content. Potentially MCAST ICA and PBS have the right foundations to establish a strategic collaborative workflow to provide opportunities for new talent that caters for this demand. MCAST ICA provides Media and Journalism courses that are in-line with broadcast industry requirements and current trends. Furthermore, other talent and departments can also engage in this endeavour particularly students and lecturers from other departments at MCAST ICA and from other MCAST Institutes. This reveals potential towards achieving what MCAST thrives for in terms of work-based learning and collaboration across Institutes, which in principle ticks all the right boxes, however in a creative media and pedagogic contexts is challenging from a logistical, practical, contextual, ethical and learning standpoints if project is not steered in right directions.

OVERALL AIM

This research aims to present a set parameters of work in a working manual for other future industry collaborations and project endeavours.

MAIN EXPECTED OUTCOME/S

1. Identify a number of diverse media projects that can be beneficial towards learner/s work experience, the learning objectives of the curriculum and the objectives of the broadcaster;
2. Identify a sample of participants including lecturers, students and broadcast professionals who are actively engaged in MCAST-PBS collaborations;
3. Interview participants in various informal and formal settings about their experience of these collaborations;
4. Provide a thematic analysis from interview transcripts with the participants;
5. Write up a discussion of findings based on results from the thematic analysis;
6. Use the discussion of findings to develop a working manual for future endeavours.

IMPACT OF RESEARCH

This research is unique in a sense that traditionally collaborations between large-sized academic and professional entities can work well on paper but require specific methodologies for successful implementation. This study aligns voices from both academic and non-academic fields to facilitate best working scenarios for current students. This study outlines issues that in the past might have been challenging to control such as Intellectual Property of work, liaison between entities, ownership and project accountability. Academic integrity, ethics and professional standards are normally central to the work students do in such endeavours thus this study will outline criteria that defines potentials and limitations of these objectives. Project Delivery, in this study it will be spelled out who will be responsible for standards expected by academics and the external stakeholders.

Other challenges will also being addressed in this study:

Monetary Funds for projects and the importance of not creating learning and work scenarios that discriminates rather than encourages productions to nurture. Software and Hardware Licences can also become an issue if projects are used for commercial purposes. Most academic hardware and software are not licensed for commercial work, therefore this study will also outline the parameters of work within each institution.

Industry conflicts. It is very important not to provide professional services that competes with professional entities. This is important because most (if not all) alumni students work directly or indirectly with same industries as their studies. Therefore, this study will also outline potential conflict of interest of such partnerships with the work of other current and/or past students. Internal and external consultation, this study provides a platform for consultation with internal and external stakeholders to see impacts and implications of collaborations with industry.

Fenek - Spearheading Wild Rabbit Research in Malta

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BACKGROUND

The main theme of study proposed is wildlife conservation, specifically targeting lagomorphs in Malta. The Lagomorpha order is represented on the Maltese islands by *Oryctolagus cuniculus*, commonly known as the Eurasian wild rabbit. Basic information such as taxonomic studies, behaviour have barely scratched the surface and population/presence data is non-existent. This research project aims to address this.

The main area of study proposed is the presence surveying technique for the locally occurring lagomorph, *Oryctolagus cuniculus*. Presence is occurrence of a species in each territory. This survey follows on the best practices established in after a pilot survey carried out on Comino to refine the methodology and identify the ideal surveying period.

This lack of information has become ever more evident in the light of the impact the RHDV2 (Rabbit hemorrhagic disease virus) is having on *Oryctolagus cuniculus*. In 2010 a new strain of RHDV was detected in France. Unfortunately, it has since spread throughout Europe and beyond, decimating wild rabbit populations and cross-infecting other lagomorph species.

Oryctolagus cuniculus in the Maltese archipelago have not been spared, numbers dropping dangerously low. However, its impact is hard to interpret due to missing data. If any conservation effort is to be made, territory mapping is the necessary starting point.

Apart from the described distribution survey, we are also engaged in a project through which we have established a colony of Maltese wild rabbits in an enclosed facility which imitates natural conditions. This is allowing for the study of behaviour, habitat influence and breeding behaviour and data amongst others. Monitor breeding and nesting behaviour of *Oryctolagus cuniculus* in the Maltese islands. Although this is a long term project, results are promising and new information about their breeding and behaviour is already being gleaned.

OVERALL AIM

The overall aim if this research endeavour is to launch a surveying campaign on the Maltese islands for *Oryctolagus cuniculus* territories, to establish a colony of Maltese wild rabbits in an enclosed facility to study behaviour and breeding as well as spearhead networking between stakeholders becoming a reference point and create an opportunity for collaboration.

Tangible results have also been achieved with the breeding colony successfully established and the first litter reaching maturity. Behavioural data already showing surprising outcomes. Following last year's breeding experience, a new design for a nest was issued with the hope of testing it in the near future.

MAIN EXPECTED OUTCOME/S

1. Mapping *Oryctolagus cuniculus* in the North Malta region.
2. Establishing a successful technique/optimal conditions for the rearing of wild rabbits in Malta (in natural conditions)
3. Provide material for genetic studies.
4. Establish an emergency breeding stock for the future.

RESULTS

The research is ongoing and current results are only preliminary. A study establishing a standard instrument for mapping and monitoring *Oryctolagus cuniculus* distribution in the Maltese islands and identifying the optimal time of year for identifying rabbit signs and markings was concluded. This has paved the way for the distribution studies to be carried out during the first quarter of 2023.

IMPACT OF RESEARCH

The main impact this research has achieved is to create a stakeholders network, educate and engage the public, and to create awareness and appreciation.

Education is a key part in any conservation effort although direct results are difficult to measure. Meeting where also held with the Wild birds Regulatory Unit, the Federation for Hunting & Conservation and the president of the Malta Falconers Club. The FKNK and MFC are important stakeholders to get on board as members of these NGO are landowners and are licensed to take wild rabbits. They spend a lot of time in the fields and are front liners who can flag issues and collect data for future research.

This networking resulted in a donation of 3 wild caught rabbit to form the original breeding stock and a number of specimens for dissection. An autopsy was carried

with the participation of the Bachelor of Science (Honours) in Animal Management and Veterinary Nursing students to help identify the disease causing the mortality. Through a Veterinary clinic, the institute came into possession of a wild rabbit carcass collected freshly deceased in the field. Once again an autopsy was carried out together with the student classes and all symptoms pointed towards the cause being identified as RHD. These is a unique opportunity for MCAST students who are normally restrained to working on domestic animals.

Another such unique opportunity for the Bachelor of Science (Honours) in Animal Management and Veterinary Nursing students was when through the project contacts they also got the opportunity to work on several Oryctolagus crania (30) which were obtained through fieldwork and contacts made during this project. Students got to assemble the skulls, analyse the anatomy and adaptations in a specialized mammal as well as compare it to a Scolapax rusticola specimen which was also obtained through contacts made during this project.

In addition to we were asked to write a number of articles about the Maltese wild rabbit for a monthly magazine which is distributed to all FKNK members (approx. 10,000 copies distributed). This is the fourth one in the series.

As pledged, mammal sighting data was contributed the National Museum of Natural History who are currently compiling data for a "Mammal Atlas for Malta 2020-2022" and pledged to contribute any relevant information to the publication.

Public outreach is at the heart of any successful effort and disseminating research findings increases the public's backing and understanding. An invitation was received to participate in a week-long event Kuzita'Jiem at Esplora interactive Science Centre and Imnarja 2022.

It is hoped that breeding and the other project facets continues to thrive and more information about this most secretive of mammals is uncovered.

Land User Land Cover Mapping of the Maltese Islands

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BACKGROUND

This project was requested by the Malta Resource Authority represented by Mr Saviour Vassallo and Mr Alexander Said. The requirements of this project were to provide the land use land cover classification change from the year 2018 to the year 2020. This is a satellite-based study utilizing the European Space Agency Copernicus programme, specifically the Sentinel-2 satellites.

This mapping is used for the purposes of national reporting of emissions and removals, from Land Use, Land-Use Change and Forestry (LULUCF) activities in accordance with international and European Union obligations of Malta, and, furthermore, to provide empirical basis for policymaking by the Maltese Government, primarily via the Ministry for the Environment, Climate Change and Planning (MECP), that enhances the sink (i.e. greenhouse gas removal) potential of the sector.

OVERALL AIM

We are currently assisting the Malta Resource Authority (MRA), as ultimate beneficiaries for this research, in the use of European Space Agency (ESA) Copernicus Sentinel-2 satellite data for the mapping of Land-Use and Land-Cover (LULC) over the Maltese Islands. The process involves identifying the areas matching pre-defined classes of: Cropland, Grassland, Forest, Settlement, Other and Wetland as per EU and National definitions.

MAIN EXPECTED OUTCOME/S

The outcome of this project is a classification of the land use over the Maltese islands leading to a mapping of the annual shift in land use, also known as the delta. The project uses ESA Copernicus Sentinel-2 satellite data, and the classification is represented as geographical shapefiles that annotate the various land uses, all of which are accessible via a Geographical Information System (GIS).

RESULTS

The first contribution of this project is an assessment of the actual footprint of the Maltese Islands. This has been found to be 31.56 kilo hectares.

The second contribution is the land use land cover classification shift. A considerable shift was noticed from cropland to grassland and vice-versa. This has been attributed to the practice by farmers known as crop cycle and thus cannot be factored in this study. The final land classifications for the year 2020 are as follows:

37.1% Cropland; 4.3% Forest; 27.9% Grassland; 28.2% Settlement; 0.02% Wetland; and 2.6% Other. There has been a total shift of 2.024 kilo hectares of land shift towards Settlement and Other, at the expense of Cropland, Forest, and Grassland from the year 2018.

IMPACT OF RESEARCH

The proposed solution aims at creating an IT solution of obtaining periodic satellite imagery over a period of a year and with the use of ML (Machine Learning) and Computer Vision (CV) techniques and to automate the process. The Sentinel-2 satellite provides a spatial resolution of 10 metres allowing for an improvement on the current state of the art as at 2018 (date of last LULC mapping).

This project benefits directly the MRA in their task of LULC mapping which is currently done manually. The use of ML techniques accelerates the process and decreases the uncertainty. This project has also the potential to serve to build knowhow and expertise in Malta which can then be shared with other countries, especially in view of the obligation of developed countries to assist, and share knowledge and technology with, developing countries. In the case of this project, there could be potential with respect to small states and small island states who may also have similar obligations under international climate change treaties but face similar problems and limitations as experienced by Malta.

The novelty of this proposal is the low-cost and long-term automated solution, tailor made for the local context, taking into consideration unique characteristics of Malta, especially those inherent to the size of the country, which necessitate the development of bespoke tools.

Monitoring Children's Approach towards learning outdoors in a Sustainable and Natural Environment

Simone Restall[1]

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BACKGROUND

The investigation this research has embarked on, addresses improvements in the approach to children reaching age-appropriate desired milestones through a hands-on outdoor discovery learning methodology. The children of Kinder 1 and 2 of St. Paul's Bay Primary were observed over a span of the past 2 scholastic years while following activities inside the classroom and outside, in the recently developed outdoor sustainable play area. Together with their teachers and LSAs their attitudes and behaviours during hands-on activities in the classroom were monitored and their attainment compared as they approached similar tasks outside in the yard. The relationship established between highly professional kindergarten teachers, assistants and LSAs was admirable, and one could not help notice the extreme dedication to cater for the individual needs of every child. In this particular school the challenge to educate applying the emergent curriculum is greater as it is a multicultural school hosting over 54 different nationalities. Educators give their best to meet each child's learning style giving opportunity to celebrate particular cultures ensuring total inclusion on everybody's part. Bearing in mind that children between 2 to 5 years are still in the pre-reading and writing stage, communication between themselves is limited and left to using play as a universal language. Based on this phenomenon the need to set up an outdoor classroom with specific areas for children to express their creativity and imagination together, further confirmed this project's creation.

OVERALL AIM

This project aims to establish a common platform serving as a multicultural playground for children of diverse cultures to meet, integrate and celebrate their abilities and talents. The objective is to establish whether outdoor learning improves the interest, performance, attitude and aptitude of the children concerned through observation, documentation and evidence given by the teachers themselves.

MAIN EXPECTED OUTCOME/S

An improvement in the interest, curiosity, attention span and disposition towards the learning outcomes on the children's part, when playing in the outdoor sustainable set up provided, intends to impact a better level of attainment at kinder level, achieving the desired milestones in the learning programme. An overriding desire on the children's part, to conduct the school-day programme outdoors is

expected, following a confirmed inclination for them to practice necessary life skills applied.

RESULTS

An experiment was conducted with the four Kinder 1 classes. Their teachers organized discovery and experiential play learning experiences in the greenhouse, atelier, mud-kitchen and performing arts area. Observations and documentation were compiled during these activities involving daily life chores essential for a smart lifestyle. The children welcomed challenges playing in the soil, handling garden tools to care for and sow new plants. They experimented with different art media to express their creativity and imagination achieving impressive results which were evidenced through photographic and videographic evidence. Essential cooking, cleaning and washing skills were applied in the mud kitchen, were children busily involved themselves to simulate real life situations in the home, successfully. The young children's talents stemming out from their diverse cultures were expressed freely through music dance and acting, inspired by the freedom they experienced on the outdoor stage and using the music wall.

IMPACT OF RESEARCH

This research confirms the theoretical scientific field applied to Early Years Methodology. The principles of early childhood theorists, who advocate learning by doing, experiential and discovery learning, problem solving, child-centred approach and the environment as the third teacher, have been a point of reference for this project materialization. This innovative early Childhood methodology is a pioneering breakthrough for modern pedagogy intended to be applied in local schools. The project contributes to the establishing of a culture of using sustainable materials and reducing the environmental impact of educational activity. This cultural change brought about by the introduction of sustainable outdoor play areas, will have a long-term impact on the outlook of society in general with respect to protection of the environment through the children and the influence they will have on their immediate families. Involving the immediate community in the setting up and implementation of the outdoor learning areas, further reinforces the cultural change needed for a sustainable lifestyle.

The use of recycled, reusable and repurposed materials for the setting up of the outdoor areas contributes directly to easing the negative effect on the environment of educational activities and reinforces the cultural change necessary to bring about positive outcomes in environmental issues. The school administration confirms that a positive enthusiasm has been generated by the implementation of the methodology, bringing the community and school closer together and becoming a hub of activity. Teachers observed that children were better behaved, more

involved and engrossed in their activities whilst attaining educational goals more effectively. This outdoor learning approach offers opportunity for children with learning difficulties to master the basic life skills necessary.

The hands-on approach and the use of repurposed materials can have a positive outcome on the ability of the children to become better skilled and thereby benefitting industry in the long term. The project orients the children from an early age towards smart living lifestyles.

The current NCF advocates an emergent curriculum on a child centred approach. This research project promotes such principles and values in agreement with the learning outcomes addressed. This outdoor learning methodology confirms the areas of development.

In a post Covid era this project contributes an essential element in reinforcing the community's social and outdoor aspects of education, offsetting the loss experienced through the isolation of Covid times. In view of important social interactions, daily routines, learning play experiences, school discipline and duties denied due to the virtual learning situation, the drive to sustainable outdoor learning is further validated.

An autobiographic graphic novel incorporating photography as a pedagogic tool for the teaching of morals and ethics in photojournalism

Simon Callus[1], Gary Hampton[1]

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BACKGROUND

The current lecturer of the photojournalism unit at MCAST ICA is Gary Hampton. Gary has a substantial number of years' experience as a photo journalist, including working with the UN on a number of projects. His experience has given him a deeper insight into the morals and ethics which come into play when deciding to take a photo or not. He has had to answer questions regarding using others' suffering, and exploiting a bad situation. Photojournalism culture does not exist in Malta making Gary one of the few people on the island able to recount what thought processes are occurring in those situations. By collaborating on this research project together, Gary is able to recount how he felt preparing for a photo, what influenced his decisions as well as the repercussions of taking the photo.

While words are a powerful medium in conveying emotions, using the medium of comics to depict the personal experiences is more effective. The research project is investigating the new and developing medium of comics and graphic novels to communicate deep, personal, and complicated realities to students. The graphic novel as a medium has begun to be explored to communicate migration, war, battling cancer, and many other adult realities. Using comics to tell Gary's experience allows the possibility of depicting realities in a more understandable and more holistic way. Comics depict the scene, but are also very effective in communicating emotions, doubts, internal thoughts, in a visual way – which photographic students are more receptive of.

The realities being communicated will then be juxtaposed with Gary's photographic work. Displaying the scene, what was said, and how Gary felt alongside the resulting images of his photojournalistic work will give new meaning to them. A new understanding of the morals and ethics behind the photo will be possible.

OVERALL AIM

This collaborative research between Gary, the photojournalist and photography lecturer, and myself as a comic illustrator and researcher will result in the development of a new medium and pedagogical tool: An autobiographical graphic novel communicating the situations and realities experienced in photojournalism, juxtaposed with the photos taken in order to teach morals and ethics to students.

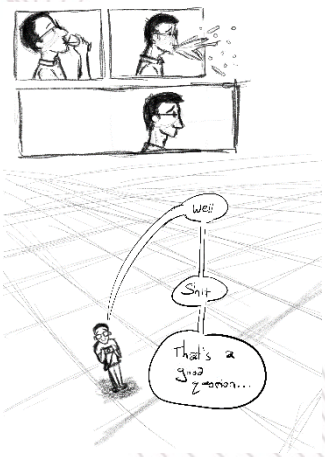
MAIN EXPECTED OUTCOME/S

The main outcome of the research is the creation and printing of the graphic novel which will serve the dual purpose of telling Gary's narrative, while also teaching about the morals and ethics of photojournalism to students who will rarely be in a position to experience them for themselves at this early stage in their careers. Data will be collected on how and if the novel manages to convey the complexities of the narratives in a more effective way. These results could then pave the way for the more common use of graphic novels as pedagogic tools in other abstract and difficult to explain units.

RESULTS

The research project is still in development and therefore no results have yet been produced.

IMPACT OF RESEARCH



The research will impact a number of fields. The finished product resulting from the research will have impact on the personal development of both the students and society in general. Anyone who is exposed the difficult, unfair, and uncomfortable situations the project will illustrate, will be forced to ask deep questions of their own morals and ethics.

Curriculum could also be affected. The use of this alternate tool, created through the collaboration of various art forms, and born out of a perceived need by the lecturers in question, could indicate that more attention needs to be given to the educators, their problems, suggested solutions, and creativity employed to deliver the best for the students.

Within the research field of comics, photojournalism, and pedagogy, the research is highlighting the benefit of inter-disciplinary collaborations. It is also adding to each of these fields because of the exploration of how the medium being employed aids in the communication of the results of the research carried out in each of them respectively.

A multidisciplinary approach in completing a dissertation for Creative Media Production

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BACKGROUND

Within the Bachelor of Creative Media Production course at MCAST ICA, all students produce a dissertation of approximately 6000 words with a project component involving the "production" of a moving image product.

This project focuses on key definitions and objectives of dissertations at the end of the Bachelor in Creative Media Production at MCAST ICA. Discussions with tutors and the final year students at ICA about the dissertation show that the purpose of the dissertation is not fully understood by the students, or even by the tutors themselves, making the need for research into the dissertation process essential. With the development and approval of Practice as Research as students' dissertations in other departments of the ICA, and the diverse ways in which the project can fit within a dissertation, a lot of uncertainty and different understandings of the role of the dissertations have emerged. It is of utmost importance to conduct research into the process, perceived aims and objectives, and deliverables of the dissertation from the point of view of all participants, specifically within the context of the Bachelor in Creative Media Production at MCAST ICA.

The Creative Media Production course deals with both the technical aspect of Media Production, as well as the artistic and aesthetic elements which enhance the communication ability of this medium. This results in students wishing to focus on different aspects of this medium in their final dissertation. So far, the dissertation process, beginning with the Statement of Intent, all the way through the final document format required of students, has led to most students feeling obliged to follow a scientific inquiry methodology. This immediately removes the possibility of artistic research, project-led dissertations, or research as practice. Following a number of preliminary meetings between four members from the lecturing staff, it was deemed necessary that research into the dissertation process be conducted.

OVERALL AIM

The aim of the research is a reassessment of a number of factors within the dissertation process which as of right now, seem to be taken for granted. The research aims to the expected outcomes of the dissertation, the research methodologies accepted, the method of delivery of research carried out, and the role of the tutor and of the student throughout the process.

MAIN EXPECTED OUTCOME/S

The results from this research will be published in a manual, which will be presented to all dissertation stakeholders to provide further relevant insight into this important part of the students' journey. This will then be combined with previous and ongoing research, pilot studies, and discussions, leading to the development of a manual for students and dissertation tutors. The manual will outline all the different approaches, outcomes and methodologies which may be used during the dissertation therefore empowering students and tutors to decide together which path best suits the student and project.

RESULTS

The research is still at the early stages, with data being collected across multiple departments.

IMPACT OF RESEARCH

The impact of the research is mostly of a pedagogical nature as it directly affects a central part of the BA in Creative Media Production course at MCAST ICA, however, in so doing it has a ripple effect which goes well beyond the institute. The dissertation is a personal research project carried out by the student. Improving this process and allowing it to be catered more to the very diverse ways in which different students think, research, and produce will have many positive outcomes. Primarily, the students' personal development as creators, researchers, and innovators will be given the right environment to grow in.

Helping students to help them reach their full potential with regards to various areas. Allowing the student to understand the purpose of and enjoy research could easily encourage them to further their studies, in turn improving society and the industry.

From an MCAST administration point of view, the research could bring to light the need for the creation of a different procedure related to the dissertation, including possible different documentation and forms, and grading rubrics. The current documents and methods of assessment of the dissertation currently being used at MCAST do not allow for the different methods or approaches. There is a heavy bias towards a more scientific method of research. This leaning is often cause for confusion and misunderstandings on the students' part as what they have been trained to do over the previous three years within the BA course is not congruent with what is being asked of them through the form. The curriculum and other related departments will need to change their expectations for the research's results to have the desired effect on the student body.

The results of the research could also open doors for other departments and institutes to reassess their dissertation process and develop their own, more apt methods and procedures.

How students understand the Chaplaincy's proposal: A narrative inquiry

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BACKGROUND

In a first part out of three research studies being conducted, a study that understood the role and function of the chaplaincy services within MCAST, pre-empted the subject of inquiry for this second part of the research. This second part of the study, currently being undertaken (academic year 2021-22), will allow the researcher to gain insight into the way that the young people, i.e., students, make sense of the presence of the chaplaincy services in MCAST. The chaplaincy is proposing several traits/ qualities to make use of when pasturing students at MCAST. These are fruit of a study conducted in 2022 titled "The voice of Chaplains in MCAST concerning the young, the chaplains and the chaplaincy and groups". The chaplain's concerns surrounding several issues faced by young people has brought the 6 chaplains together for individual interviews, and the data recorded has been transcribed and described in a separate report. This focus group is the next step to understanding how these traits could favour a Chaplaincy that is present for the young, as an agent of socialization. The statements are open-ended and intended to spark discussions with the students. The statements together form the basis of the main category that was elicited from the study conducted with the chaplains, and like a spectrum of light rays dispersed while passing through a glass lens, so, the spectrum consists of the various categories, that in the researcher's and in the chaplain's, perspective form the basis of their pastoral work in MCAST. These subcategories consist in the themes, searching for the young; solidarity among the young; alleviating poverty; especially the pervasive poverty of loneliness; relevance to a culture; a familial approach to being with the young in the Salesian style; openness to previously unexplored and conflicting youth realities; and finally, the transformation of the young via the route of groups. These subcategories are considered all to be linked to a main category of relationships. This, as a background, will form the basis for this next part of the study

OVERALL AIM

The aim is to begin to concretize the initial working theory about pasturing the young. Through focus groups it is the intent of this paper to listen to the voice of a group of students in MCAST, so that then the chaplaincy may respond by carrying out their educational and pastoral motive of work as Salesians. The study is making use of an adaptive systems approach to meet the needs of the young, continuing with the voice of the young as the protagonists of the pastoral services offered, I find it necessary to understand what their impressions and wishes are for the

Salesian congregation to understand better how its missionary activity will translate into MCAST.

MAIN EXPECTED OUTCOME/S

The study intends to publish a paper with the results of the study by the end of the academic year 2023 and write a position paper in the form of suggestions for future pastoral endeavours to be presented to the chaplaincy team and to other Salesian fora that might find the study results of interest to their realities. The outcome of this study will provide insight into the problem of pastoral needs of the participants and will be in a better position to make suggestions to the chaplaincy team on what will improve the effectiveness of the lived pastoral Chaplaincy experience.

RESULTS

So far there are not results due to the focus groups not having been conducted.

IMPACT OF RESEARCH

My positionality for this research is one where the study entices me to study further the field of youth from a youth ministry position. Youth Ministry is a profession recognized by the laws of Malta under the Youth Work profession act (chap 533). This research seeks to add knowledge to the study and practice of Youth Ministry. It does so by considering young people's needs, and by suggesting how as a Church on a journey, and as persons responsible for young people, we ought to respond. In a broader scope, the better that young people are taken care of, the healthier a society should be, or in other words, the youth are the health barometer of a church (Frantisek, 2014). In this way, young people that feel worthy of being loved and of loving should be healthier versions of themselves. This said, the conclusion is drawn out by itself, that the healthier the youth are, the less of a burden will they be on society.

This is another milestone for my personal development since it is another research project being undertaken to discover more of my vocation as lecturer working in a formal educational post-secondary setting. I say this, even in the capacity of a registered professional youth pastoral worker which baggage I also carry, because I am going to engage with participants from a narrative inquiry perspective. Meanwhile, although this area of work mainly finds its fulfilment within the voluntary sector, I am still of the opinion that this field of youth is under researched in Malta, especially where young people are seen from an anthropological and sociological lens. I am of the belief that this study has what to contribute to wider audience than simply to youth ministry.

By pointing out the gaps in the research, and from the insights given by the Salesians through these research projects, could serve to influence policy where it comes to the proper treatment and care of young people in MCAST. One instance is knowing

the audience, knowing who the youth are, sitting in front of the lecturer, since as much of the focus of pedagogy is on the learning of students, studies like this and others have as their focus the care of the young which still requires to be considered when in the classroom/workshop setting. Research shows that there are strong correlations between student learning and student wellbeing, and this study showcases the Salesian way of care for the young in their various personal, social and political dimensions.

On a final note, I conclude with the words of Frantisek (2014) that the youth are the health barometer of the Church, requiring that for there to be a healthy society, there needs to be a healthy young generation. Many initiatives are taken that positively affect the young, such as in sports, in employment, in education and so on. However, seldom is there research that highlights the ways in which a more experienced adult could accompany young people through their growing years into adulthood. It is in the hope of this, that this research will inspire thought for finding ways so that more experienced adults could be present in the lives of young people. I believe this research touches on at least three of the five strategic priorities (2022-25) set out by the EU. These are, young people's access to rights, living together in peaceful and inclusive societies, and Youth work.

Projects, Initiatives, and the Future of Cyber Security at MCAST

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BACKGROUND

The increased usage of online shopping and other services since the start of the COVID-19 lockdowns has resulted in more activities shifting to the Internet. Tech-savvy individuals started working remotely and ordering more product deliveries, while others tried such services for the first time due to the pandemic restrictions. This has provided online criminals a larger pool of potential victims and a wider range of deception opportunities. There was an uptake in phishing with messages related to COVID, banking and deliveries souring both locally and internationally. Another factor contributing to the security threat landscape is the greater familiarity with cryptocurrencies whose more anonymous payment methods fuelled a ransomware boom. On a continental level, both the governing bodies and business leaders are feeling the need to improve cyber security legislation, invest in technical mechanisms and employ experts to improve their posture. Locally the situation is slightly harder, where a chronic deficit of security experts is paired with a reactive attitude by leaders with little appetite to invest in security defences. At MCAST we were no exception, with an overall low cybersecurity awareness in the community, delays in implementing technical security mechanisms and very few opportunities for the students who are interested in the field. Over the past few years there have been concerted efforts to promote cybersecurity, especially at the Institute of ICT. This resulted in increasing numbers of security-themed dissertations from level 6 students, the setting up of MCAST HackSpace, a cross-institute research into the preparedness to deal with phishing attempts and work towards the introduction of a new level 6 study programme focussing on computer and network security. This was possible thanks to strong ties with key players in the local security industry and support both from MCAST and the eSkills Malta Foundation.

OVERALL AIM

The overall aim of this research effort was to work towards creating a platform and raise the profile of cyber security research within the MCAST community. This has been pursued by the setting up of MCAST HackSpace, organising thematic events, actively working towards the introduction of a new cyber security degree stream within the Institute of ICT, proposing and facilitating research projects together with students and building links with industry partners.

MAIN EXPECTED OUTCOME/S

1. The setup, running and planned expansion of MCAST HackSpace beyond IICT.
2. The design, development and launch of a new level 6 study programme in cyber security within the Institute of ICT.
3. A healthy collaboration with key industry players on research projects involving both students and academic staff.

RESULTS

Phishing simulation exercises were held with a small group of volunteers from IICT and ICA. Their personal email addresses were used as permission to use MCAST email was not given. Even given these limitations, between 15-39% of the participants clicked on links in the simulated phishing emails sent to them. A small number of them said in subsequent interviews that they clicked out of curiosity with the majority not noticing it was a phishing attempt. Current research direction involves the development of a gamified website where participants can try to guess is an email is phishing or not, while instrumentation within the website's code will monitor user behaviour. This data can be used later to infer uncertainties and challenging situations automatically.

IMPACT OF RESEARCH

The European Union has recently outlined a strategy to boost its ability to fight and recover from cyberattacks. The EU Policy for Cyber Defence has three areas of action: technical resilience, operational capacity, and cooperation. The aims of this research are in line with these goals, and we plan to work locally with MITA supporting then with the newly launched Cybersecurity National Coordination Centre.

Part of this research aims to shed light on the preparedness of the MCAST community to deal with phishing and help improve the security posture overall through awareness. A tool is being developed to improve analysis by producing a personalised report that includes user behaviour and not just the outcomes. Such a tool can be used as part of a training programme in the future. A dataset of targeted local phishing campaigns was collected, catalogued, and made available for future research.

MCAST HackSpace, together with the introduction of the proposed cybersecurity degree programme, should have a positive impact on the curriculum being offered at MCAST by offering a wider range of courses that are in line with the current technological developments. Even students from other streams, Software Development and Computer Networks in particular, can benefit from more exposure to security-oriented training as this would make them overall better

professionals. This in turn would greatly benefit the local economy by providing a steady supply of graduates with both the mind-set and the technical skills to pursue a career in the available cyber security roles.

Collaborations with the industry players can on one hand provide MCAST with up-to-date and verifiable information about the current and future needs while on the other hand open the door to collaborations at dissertation and even at EU/local level projects. It also opens possibilities of sponsorships from industry partners, especially to cover the cost for staff training and the purchase of specialised equipment.

An Overview of the Fun Fit 5 (FF5) Research Project

Melanie Darmanin[1], Renzo Kerr-Cumbo[1], Matthew Muscat Inglott[1], Heathcliff Schembri[1]

[1]MCAST Institute of Community Services

BACKGROUND

The benefits of physical activity (PA) are known and substantiated by research, yet studies also indicate that a 'sedentary lifestyle' is adversely affecting young children, resulting in reduced quality of basic motor skills, and stunted physical literacy development. In light of such concerns, schools have a vital role to play, not only in promoting healthy eating and living, but also to actively embrace programmes through which children can increase their participation in PA within school hours. This dire need has instigated the implementation of the Fun Fit 5 (FF5) programme and research project. The programme aims at introducing a daily session of PA with year 4 students in three primary schools whilst the research project, which is essentially structured as a large-scale experimental study, will test for measurable effects of the programme on children's physical, academic and well-being domains. Data will be primarily gathered from two classes in each of the three selected schools; the treatment and the control group. The treatment class groups shall be engaging in a daily PA session which is designed and implemented by two coaches, whilst the control group will have the usual number of physical education lessons given by their respective class and PE teacher. The research project also aims at exploring challenges and benefits from the unique perspectives of students, parents/legal guardians, coaches and members of staff. A mixed-methods approach will be adopted and data will be collected during three phases, in one academic year. The first and third phase will focus on the pre- and post- implementation of the FF5 project whilst the second phase will focus on the observations of the running of the programme.

OVERALL AIM

The overarching aim of this mixed methods research is to investigate the implications of one PA per day in three local state schools. The main focus would be to investigate in what ways, if any, does the daily PA affect the APW paradigm, that is, the children's academic, physical and well-being domains. The objectives are the following; i) to explore the challenges and benefits, if any, when implementing a nationwide pilot project which promotes daily PA, ii) to find whether daily PA affects students' academic, physical and well-being development, iii) to analyse and interpret the views of the participants involved – students, parents, LSEs, SLT members, and coaches and iv) to identify the lessons learnt through this project in

order to inform the way forward; future teaching and learning processes in VET (related to sports education) and within educational institutions.

MAIN EXPECTED OUTCOME/S

The main expected outcome is to establish an understanding and answer the following Research Questions (RQ) underpinning this research. These are:
Main RQ: In what ways, if any, does a daily physical activity (PA) project in primary schools in Malta affect the children's academic, physical and well-being domains?
H1: There is a significant treatment effect resulting from the application of the programme on academic performance and cognitive functioning.
H2: There is a significant treatment effect resulting from the application of the programme on functional physical capabilities and anthropometry.
H3: There is a significant treatment effect resulting from the application of the programme on psychological and emotional well-being.
Sub RQ 1: What are the challenges encountered, if any, when implementing such a nation-wide pilot project in Malta?
Sub RQ 2: What lessons can be learnt from the implementation of this pilot project, to inform future teaching and learning processes in VET educational institutions such as MCAST?

RESULTS

The presentation will give an overview of the Fun Fit 5 research project.

IMPACT OF RESEARCH

Research and literature in the field of physical education and sports assert that physical activity (PA) exhibits numerous impacts and benefits in children and society at large, some associated with social, psychological and cognitive aspects (Bailey 2006, Ohuruogu 2016, Tambalis, 2022, World Health Organisation 2020). Individuals who engage in PA tend to socialize more, enjoy teamwork, and are more likely to increase their self-esteem, self-confidence and discipline (Tambalis, 2022). PA also plays an imperative role in preventing a variety of illnesses, including obesity and high blood pressure (NASPE 2012, Ohuruogu 2016). Further to the benefits outlined, Tambalis (2022) argues that PA is important for one's psychological well-being, it increases opportunities for academic achievement, and maintains energy balance which contributes to healthy growth. In the same vein, The World Health Organization (2020) elaborates on the consecutive benefits outlined, and refers to cardiometabolic health (dyslipidemia, glucose, and insulin resistance), bone health, mental health (reduced symptoms of depression); and reduced adiposity as benefits. These outlined benefits might ultimately impact not only the student participants who are taking part in the FF5 programme but also future generations. This research study can also impact the way physical activities are incorporated

within school dynamics and thus inform or question the National Curriculum Framework's (2012) assertion that 5% of learning should be distributed across health and physical education. Findings can possibly inform future decisions pertaining to two aspects; i) the enrolment of such programmes across a national level and ii) prospective teaching and learning processes within the context of primary schools. Apart from the direct influence on the student participants, this research project has also been innovative within the field of research at MCAST. The fact that this research project is based on two combined fields; education and sports, researchers who work within both sectors have been liaising together on one common project. This, therefore, impacts the manifestation of research in a way that enhances collaboration across different sectors within the same institute. Such collaborative practices shall also enhance the researchers' contribution to knowledge, on a personal and professional level.

Love and Hate in Maltese Media: Affective Polarization

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BACKGROUND

A vast literature in social psychology demonstrates that any such in-group versus out-group distinction, even one based on the most trivial of shared characteristics, triggers both positive feelings for the in-group and negative evaluations of the out-group (Tajfel & Billig, 1973). The more salient the group identitifation, the stronger these intergroup divisions (Gaertner et al., 1993). Many US scholars have examined polarization (Abramowitz & Saunders, 2008; Lelkes, 2016; Levendusky, 2013) and fewer in other countries (Garrett et al., 2014; Lee, 2005; Wojcieszak, Azrout, & Vreese, 2018). Those with higher levels of affective polarization (i.e., those who have a larger gap between positive feelings for their in-group and negative feelings for their out-group) were more likely to engage in discussion with individuals who hold similar views as themselves (Hutchens et al., (2019).

OVERALL AIM

It is not surprising that repeated exposure to content praising one's allies and criticizing political opponents would cause attitudes toward these groups to diverge (Turner and Tajfel, 1979). Previous studies have found that the consumption of pro-party media sources leads viewers to evaluate the opponents more negatively (Levendusky, 2013). Moreover, in group members judge these partisan information sources as more credible and diverse, because they share a partisan identity with the audience (McGuire, 1985, Stroud et al., 2014). Research has suggested that the consumption of partisan media influences affective polarization (Garrett et al., 2014). The contemporary high-choice media environment allows partisans to selectively consume political information sources that are consistent with their pre-existing preferences (Lyengar & Hahn, 2009, Stroud, 2011). Arceneaux & Johnson (2013) noted that stories on partisan media are framed to upload a certain party´s political agenda and/or interpreted in a certain ideological direction. Therefore, pro-party information is most likely to exacerbate affective polarization. If partisan media tends to bolster one´s partisan identity by facilitating individuals to make comparisons favourable to their own party (Knobloch-Westerwick, 2014), is it the same for the Maltese media?

MAIN EXPECTED OUTCOME/S

Anchors and commentators of these partisan television programs usually explicitly criticize the opposing party (Jamieson & Cappella, 2008) and are particularly persuasive for the in-party members (Arceneaux & Johnson, 2013, Mackie et al.,

1990). Thus in-group members tend to trust these opinions, considering the other side as unfavourable (Tajfel, 1978, Tajfel & Turner, 1979, Lyengar & Westwood, 2015). These negative emotions which are learned from and elicited by pro-party information sources, could subsequently exert a strong impact on affective polarization (Lu & Lee, 2019). Subsequently, as partisan news becomes more popular, affective polarization is likely to increase because sympathetic media tend to be used more often than the alternative (Garrett et al., 2018).

My hypothesis for this study is:

H1: Selection of congenial partisan media increases affective polarization and out-group derogation, whereas selection of non-congenial partisan media decreases them.

Why would an increase in partisan media, increase affective polarization and outgroup derogation? Consistent with selective exposure research, selecting only partisan media that matches with their in group beliefs, contributes to affective polarization (Arceneaux, Johnson, & Cryderman, 2013; Bello & Rolfe, 2014; Knobloch-Westerwick, 2012; Stroud, 2011). Users applaud their party on social media (Shin and Thorson 2017; Wojcieszak et al. 2021) and partisan media disproportionately cover the opponents negatively (Berry & Sobieraj, 2014).

RESULTS

I will employ an observational survey design. Participants will be random assigned. To measure the independent variable in-group extremity, subjects will rate 'likeable' versus 'unlikeable' in-group and outgroup members on a set of positive and negative trait-descriptors previously known to be equally typical of the in-group and outgroup. Following Iyengar et al.'s (2012) research study, I will measure, my dependent variable, affective polarization, using favourability ratings of in- and out-party members (two major political parties [Labour/Nationalist]). Specifically, respondents will be asked to rate their feelings towards each from 0 to 10, with higher values denoting greater favourability, where the absolute value of the difference between feeling thermometer evaluations of the parties will be measured. Participants will be asked about the importance of their own partisan identity ("How important to you is your identification as a [Labour/Nationalist]?" on a scale ranging from 1 to 7).

IMPACT OF RESEARCH

The impact of this research is a multi-disciplinary field where by studying the impact of partisan media, we can see whether society is becoming more (or less) polarized. Research has shown that this in turn changes the behaviour and attitude of people towards the other group on every level, not only on ideological differences. In summary, civility is an important social norm underlying our interactions with one

another, especially across lines of political difference (Keith & Danisch, 2020). Second there is a gap in affective polarization literature that focuses on countries, outside the United States. Studies have shown that affective polarization is higher in Southern Europe than in the US and this study will add to the literature. Thirdly it is essential for scholars to study the media selection of in-groups and outgroups and see whether partisan media is aiding or eroding the democratic process in a country.

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