Research & Innovation EXPO 21

Abstract Book

MCAST

Research & Innovation EXPO 21

The 3rd MCAST Research & Innovation EXPO

20th-21st December 2021

ABOUT THIS BOOK

Dear participant, welcome to the 3rd MCAST Research & Innovation EXPO 2021

This book is a collection of abstracts related to all the presentations that are taking place during the MCAST R&I EXPO 2021

Each abstract includes a QR (Quick Response) code which provides access to the digital version of the abstract hosted online within the R&I EXPO 2021 website. Additionally, it can be used in the future (post EXPO) to rewatch the recordings of the presentations delivered by the researchers.

Scanning a QR code using your device:

- Open the QR reader application or the camera on your smartphone
- Point it at the QR code – you should be able to point your camera from any angle and still receive the necessary information
- The abstract URL will be instantly shown on screen or opened in your default browser

On the MCAST R&I EXPO 2021 website, you can find the link to access the **Whova** App and register for the event. The **Whova** app will allow you to browse the online programme and create your own personalized schedule according to the different presentations and events that you would like to attend and follow.

Please scan the QR code below to access the MCAST R&I EXPO 2021 Website

May we wish you all an enjoyable conference.
The Organizing Committee

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FOREWORD

MCAST

MESSAGE FROM THE PRINCIPAL

Professor Joachim James Calleja

Principal and CEO of MCAST)

A few years ago an MCAST Research and Innovation EXPO was unthinkable. This is the third edition aimed at showcasing the research work that has been carried out by over 100 researchers from all Institutes. This is a remarkable achievement for which the credit goes to Dr Alex Rizzo and his formidable team who have sought to translate strategic objective number 7 in the College's Strategic Plan 2019-2021 into multiple activities. I am very pleased to note that over these last three years the research Team have managed to introduce a research culture which is now entrenched in all six Institutes.

Lecturers have been engaged, new concepts have been established and several research bids have been submitted. In addition the Journal of Applied Research and Practice is in its fifth volume serving as a platform for presenting vocational and applied research that is carried out either by researchers and professionals working at MCAST or with collaborating partners. The Journal is an excellent vehicle to encourage more lecturing staff to undertake research that can reach a much wider readership than Malta. In doing so the College has encouraged more lecturing staff members to raise their research standards, to embark on socio-economic and cultural issues that reflect the College's concern for the community that it serves and attract industry to our new research capacity that could lead to business development and transfer of knowledge. An exposure of 12.9 million externally funded projects, where MCAST is contributing knowledge worth 2.6 million is an important achievement. Since 2020 to date MCAST has submitted 87 projects, out of which 23 were awarded to the College.

A question many ask is why should a vocational and professional institution such as MCAST take on research activities? The answer is very simple. MCAST reflects the work place; it reflects the advancements in science and technology; it is one of the key providers of tertiary education and training in Malta. With qualifications at MCAST covering the whole spectrum of the Malta Qualifications Framework

including the doctoral degree level, it is essential that MCAST undertakes research that enriches its programmes of studies, updates its qualifications particularly those in higher education. Through research, the College is also building the capacity for lecturers to transform their knowledge and hands-on experiences in research projects that aim at a better quality of life.

I augur that the 2021 Research and Innovation EXPO will once again enable MCAST to continue incentivising the development of applied research and sustainable innovation across the College. As a Community College it is expected that such research will contribute in no small measure to improving better conditions of life to Maltese citizens, international residents and visitors.

THE ORGANIZING COMMITTEE

Dr Ing Alex Rizzo

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

Dr Ing Alex Rizzo's main expertise are in vocational education & training (VET), grounded theory research on small organizational behaviour, and integrated water resource efficiency. Alex is presently concluding his term as Deputy Principal for R&I at MCAST, where he has set up a corporate research framework through an excellent team spearheaded by Director Clifford De Raffaele and six Senior Research Officers. He has applied a range of innovation drives that include EdTech, augmented & virtual reality and artificial intelligence, through a top innovation team ably guided by Deputy Director Edwin Zammit. Alex was previously Head of College at MCAST, responsible for degrees and Masters programmes, and responsible for launching a suite of new technological Masters programmes that include innovative areas such as lean enterprise, mechatronics and high-performance buildings. Prior to this Alex had set up and managed the MCAST Institute of Applied Sciences, launching programmes into industrial sciences, health sciences and environmental sciences. Alex's previous engagements have included that of Deputy Chairman at the Malta Water Services Corporation (WSC), and various engineering and management roles within the water sector for over 15 years. Alex presently heads a number of research and skilling projects relating to the efficient use of water, as well as in grounded theory research on small organizational behaviour. Alex is a Fellow and Chartered Member of the Institution of Engineering & Technology and of the Chartered Institution for Water and Environmental Management. Dr Rizzo graduated with a Bachelor of Engineering at the University of Malta in 1989, a Masters in Business Administration at the same university in 2001, and a Doctorate in Business Administration from the Robert Gordon University in Scotland in 2011.

Dr Ing Clifford De Raffaele

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

Dr. Ing. Clifford De Raffaele is the Director of Research and Innovation at MCAST, responsible for the vast initiatives stemming across the organization as well as setting the strategic direction of MCAST towards pursuing research opportunities. Within the Applied Research and Innovation Centre (ARIC), he leads and motivates a highly dynamic and proficient core team of colleagues, which together have transformed the R&I landscape at MCAST. Through the conceptualization and implementation of the MCAST Research Framework, he has driven a cultural change within the institution, with over 100 research-active academics and 87 externally funded collaborations originating within a couple of years. Clifford's experience in academia and senior management, coupled with his passion and studies in Engineering and Computer Science support his proficient efforts to develop and instigate research and innovation, whereby he has also directly contributed towards the establishment of an AI Strategy for MCAST, an EdTech Innovation Framework and a Master by Research programme across the institution. Clifford further contributes academically through lecturing and supervision of postgraduate students through various degrees at MCAST, as well as holding tenure as a visiting Senior Lecturer at Middlesex University.

Mr Edwin Zammit

MCAST Deputy Director for Innovation
Applied Research & Innovation Center (ARIC)

Mr. Edwin Zammit is currently the Deputy Director for Innovation within the Applied Research & Innovation Centre at MCAST. He oversees projects that fall under the MCAST EdTech-Innovation framework together with projects that fall under the innovation sphere. As a leading member of the team designing the MCAST innovation model adopted by the MCAST ARIC he considers innovation as a pivotal driver thus pushing MCAST closer to its strategic objectives. Innovation will support MCAST in its aim to enhance the student learning process and advance in new directions and with new methodologies. Edwin actively works in consolidating MCAST's structures and services using established innovation models to propel the organisation into the 4th Education revolution. Together with other MCAST staff members, he works on implementing EdTech (educational technologies), that is a cluster of disruptive technologies that 'significantly alters the way that users and industries operate. The current areas of focus include blended learning, augmented realty, virtual reality, VET & Tech visualisation, assisted reality, telepresence robotics and artificial intelligence. Such works aim to Pre-empt the ever changing students' expectations in educational engagement along their student learning pathway. Technology has an important role to play in the brining innovation within the MCAST ecosystem. Nevertheless, Mr. Zammit highly values that importance of the pedagogical enhancements brought by the technology. To this extent he brings over 10 years of teaching experiences. His management experiences within MCAST support him in his endeavour of building an EdTech culture within MCAST by create networks of like-minded people within the MCAST community.

The ARIC Senior Research Officers Team

LLM Gonca Kara

Institute of Information & Communication Technology

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 & program 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

Institute for the Creative Arts

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 Andre Attard

Institute of Engineering and Transport

Dr Andre Attard, a recent Master and PhD engineering graduate from the University of Strathclyde - Glasgow, joined MCAST as a Senior Research Officer within the Applied Research and Innovation Centre (ARIC) to fulfil his role of supporting the IET with the management of active research projects while also encouraging the uptake of research in other emerging fields of engineering. The Institute of Engineering and Transport (IET) covers a diverse portfolio of engineering fields, from the conventional Mechanical and Electrical streams to the contemporary Mechatronic and Aerospace streams. Since the conceptualisation of ARIC and the MCAST Research Framework, the IET saw a two-fold increase in research uptake. Research within the IET currently covers vast areas of engineering, such as identifying novel methodologies to study fluid flow phenomena, research using Earth Observation imaging modalities to forecast Mediterranean weather and to study the vegetation patterns in the Maltese Islands, studies of the properties of materials subjected to high-velocity impacts and much more. The participants of this MCAST R&I EXPO are encouraged to attend the presentations of the IET researchers which will be a testament to the hard work and efforts that go into these research projects.

Dr Lorna Bonnici West

Institute of Applied Sciences

Dr. Lorna Marie Bonnici West proficiently instigates scientific research excellence across the Institute of Applied Sciences (IAS), capitalizing on her Ph.D. and post- doctoral studies in Pharmacy. Research at IAS has expanded widely and now spans across different themes, including applied water research, environmental, including the study of pollutants in different environmental matrices, nursing, health innovation, agriculture, aquatics and animal sciences and space sciences research. Being passionately interested in research, Lorna has also been highly active in supporting different research teams at IAS in the writing of research proposals for different funds, including Horizon 2020 and Horizon Europe, PRIMA, MCST-TÜBİTAK, PARADISE and FUSION R&I: Research Excellence Programme. Lorna also contributes academically through the supervision of students reading for Master of Science at MCAST and as a Visiting Senior Lecturer at the Department of Clinical Pharmacology & Therapeutics, University of Malta.

Dr Maria Cardona

Institute of Communities Services

Dr Maria Cardona' s experience as a scientific researcher and educator as well as her keen interest in social justice and youth work all contributed to her role as a Senior Research Officer within the Institute of Community Services (ICS). ICS is a highly dynamic institute with research areas as diverse as Exercise for Health and Sports research, Early Years and Inclusive Education, Higher Education and Health and Social Care. These areas are also of interest to lecturers from the Learning Support Unit and other Institutes. Her diverse experience has contributed to successfully supporting researchers working within these Research Themes to initiate and persist in carrying out research projects depending on their level of expertise. Maria also supervises Master's students in the areas of Sports research and Environmental Science. She joined MCAST after obtaining her doctorate from the University of Padova and a brief stance teaching in a secondary school. She is currently on leave from her position after being awarded a Marie-Sklodowska Curie Individual Fellowship to carry out her post-doc. Apart from work, she is involved with local groups on issues related to social justice, especially environmental justice.

Dr Massimo Pierucci

Institute of Business Management & Commerce

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 Business, Management and Commerce, fulfilling his role of Senior Research Officer. The Institute has recently seen an uptake of different research activities, with projects spanning from Applied Marketing research to Economy and Finance and taking into consideration the vocational education mission of the Institute.

The ARIC Research & Innovation Team

Ms Nika Levikov

Researcher – EIT Climate-KIC Hub Coordinator

Ms Nika Levikov is originally from the United States, and has completed a Bachelor's in biology (with a minor in Russian) and then two Masters from the UK in creative writing and conservation science. Nika has also spent time travelling and working in East Africa in the conservation sector. She has over 7 years of experience in biology and social science research, in particular, working the fields of ecology, STEAM, public engagement and science communication. Nika has over 10 years of experience in grant and academic writing, as well as editing. She has been working on EU projects for over 4 years addressing themes including: sustainable innovation initiatives, transdisciplinary practice, urban greening and Responsible Research and Innovation (RRI). Recent large-scale EU projects include NUCLEUS: implementing RRI best practice at partner institutions and VARCITIES: urban greening through nature-based solutions (NBS) with the incorporation of smart tech to enhance wellbeing of citizens. Nika's role at MCAST is to manage the CKIC Hub, which is

running several entrepreneurship and education programmes aimed at addressing climate change. She smanages and oversee the implementation of Young Innovators: empowering youth through climate education and green skills acquisition, and MED ClimAccelerator: enabling cleantech and climate-focused start-ups through tailored training, mentoring and funding.

Dr Suzanne Maas

Researcher – EIT Urban Mobility

Dr Suzanne Maas joined the Applied Research and Innovation Centre team at MCAST earlier this year to work on projects and programmes under the umbrella of the EIT Climate-KIC and EIT Urban Mobility Hubs, in which MCAST is a partner. With an MSc in Environmental Sciences from Wageningen University in the Netherlands, Suzanne brings over 10 years of experience working as a researcher and activist in the environmental field to the team. She recently completed her PhD research on the topic of bike-sharing and cycling promotion in Southern European island cities at the University of Malta. She is passionate about inspiring climate action in Malta, particularly in the field of transport – one of the main sources of carbon emissions in Malta – and with her work hopes to inspire a shift towards cleaner and more sustainable modes of transport and a better quality of life, in Malta and beyond.

Mr Abduarahman Bazena

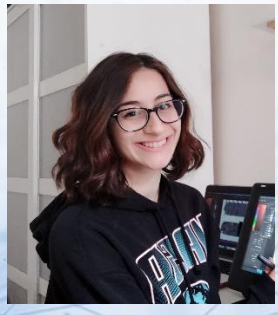
ARIC Researcher

Mr Abduarahman Bazena is a first-class Computer Science Honours Degree graduate from Middlesex University. He is concluding his Master's dissertation in Data Science. Abduarahman has worked as a researcher, systems architect, and engineer on a wide range of research projects spanning from medical device engineering, computer vision, natural language processing, educational technologies. His grasp on a wide variety of concepts and technologies brings a diversity of knowledge and an opportunity to be involved at the cutting edge of technology. Abduarahman is actively engaged in several research projects with networks of academics and industry professionals from various fields' expertise. In addition, Abduarahman is a technical researcher within the applied research and innovation centre research team.

Mr David Deguara

ARIC Researcher

David Deguara, who is 28 years old, is a former Maths and Physics secondary school teacher who is also very passionate about software development. He worked for a brief period as a full-time Ed-Tech researcher at ARIC, where he was involved in several projects. Currently, he is working as a full-time lecturer at IICT.David was introduced to developing software at a very young age and has since acquired vast experience in the field. Following his successful completion of his B.Ed (Hons), he immediately started a Diploma in Computing and then completed a B.Sc (Hons) in Computer Science.His focus has always been to integrate the two things he loves the most, education and software development. This has led him to contribute in projects involving Web technologies, VR, AR, Robotics, and now also game development, all directly driven with the sole purpose of improving the students' overall learning experience.In his new role as a vocational lecturer at IICT, David's priority is helping students achieve their goals and helping them bloom in their chosen area of study. He is also lightly involved in research and assisting in ARIC projects, mostly related to Web development and DevOps.



Ms Lisa Theuma

ARIC Researcher

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

ARIC Researcher

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 Honors. 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.

PROGRAMME HIGHLIGHTS

Monday 20th December 2021:

9:00 – 9:30	**Opening Ceremony** **Prof Joachim James Calleja** Principal and CEO (MCAST) **Alex Rizzo** Deputy Principal of Research & Innovation (MCAST) **Clifford De Raffaele** Director of Research & Innovation (MCAST)			
9:30 – 11:00	**Parallel Session 1 - Presentations**			
	Emerging Technology and Creative Innovation	Social Well-being, Sports and Health	Quality Pedagogy and Effective Learning	Environmental and Cultural Sustainability
11:00 – 11:30	Coffee Break/Poster Session			
11:30 – 13:00	**Parallel Session 2 - Presentations**			
	Emerging Technology and Creative Innovation	Social Well-being, Sports and Health	Quality Pedagogy and Effective Learning	Environmental and Cultural Sustainability
13:00 – 14:00	Lunch Break/Poster Session			
14:00 – 15:00	**Parallel Session 3 - Presentations**			
	Emerging Technology and Creative Innovation	Social Well-being, Sports and Health	Quality Pedagogy and Effective Learning	Environmental and Cultural Sustainability
15:00 – 15:30	Coffee Break/Poster Session			
15:30 – 16:30	**Session 4 Workshops**			
19:00	**Research Networking Dinner**			

Tuesday 21st December 2021:

<table>
<tr><td>9:00 – 9:30</td><td colspan="4">Poster Session</td></tr>
<tr><td rowspan="2">9:30 – 11:00</td><td colspan="4">Parallel Session 1 - Presentations</td></tr>
<tr><td>Emerging Technology and Creative Innovation</td><td>Social Well-being, Sports and Health</td><td>Quality Pedagogy and Effective Learning</td><td>Environmental and Cultural Sustainability</td></tr>
<tr><td>10:00 – 10:30</td><td colspan="4">Closing Ceremony

Prof Joachim James Calleja
Principal and CEO (MCAST)

Hon Dr Owen Bonnici
Minister for Equality, Research and Innovation</td></tr>
<tr><td>11:00 – 11:30</td><td colspan="4">Coffee Break/Poster Session</td></tr>
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<tr><td>Emerging Technology and Creative Innovation</td><td>Social Well-being, Sports and Health</td><td>Quality Pedagogy and Effective Learning</td><td>Environmental and Cultural Sustainability</td></tr>
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PROGRAMME OUTLINE – DAY 1

PARALLEL SYMPOSIUM	**EMERGING TECHNOLOGY AND CREATIVE INNOVATION** *ROOM: CONFERENCE HALL 1*
SESSION 1 PAGE **3**	*Chair: Gonca Kara*
9:30	*Welcome Address* **Conrad Vassallo** – *Director of the IICT*
9:40	*A study into the design of an autonomous sea-faring drone for the collection of floating waste plastics from ports and harbours.* **Mark Theuma, Suzanne Psaila**
10:00	*RELAR - Remote learning and examination by using AR in maritime VET education* **Christian Camilleri**
10:20	*The adaptation of comic language to digital platforms: The creation of a graphic novel for print and online* **Simon Callus**
10:40	*Personalised Semantic User Interfaces for Games* **Owen Sacco**
11.00-11.30	**Coffee Break/Poster Session**
SESSION 2 PAGE 9	*Chair: Lorna Bonnici West*
11:30	*Chatbot in Education as an Assistant Tutor* **Silvio Nocilla**
11:45	*Days Blending Together* **Angela Cassar**
12:00	*Ultrasonic data transmission link for microscale chloride ion detection sensors*. **Stephen Sammut**
12:10	*Heightening Sustainable Innovation in Our HEIs and Societies* **Gonca Kara**
12:30	*Development of a hypervelocity impacts facility at MCAST* **Leonardo Barilaro**
13.00-14.00	**Lunch Break/Poster Session**
SESSION 3 PAGE 15	*Chair Nika Levikov*
14:00	*Application of WRF-Chem for Dust Prediction* **Joseph A. Zammit, Joshua Bugeja**
14:20	*Integrated Simulation and Assessment in Donning and Doffing for Healthcare Professionals (ISADD)* **Neville Schembri, Phyllis Farrugia Abanifi, Jonathan Vella, Dorianne Cachia**
15.00-15.30	**Coffee Break/Poster Session**
15.30	*Workshop*

PARALLEL SYMPOSIUM	**SOCIAL WELL-BEING, SPORTS AND HEALTH** ***ROOM: CONFERENCE HALL 2***
SESSION 1 PAGE 18	*Chair: Massimo Pierucci*
9:30	*Welcome Address* **Ann Marie *Cassar*** *– Director of the ICS*
9:40	*Emotional Eating, Stress and Coping in College Students during the COVID-19 pandemic.* **Daniela Cassola**
9:55	Boutique Hotels in the Three Cities – what would make locals prefer boutique hotels in this area of Malta over other areas and over five-star luxury hotels? **Paul Camilleri**
10:10	*Schizophrenia and its co-morbidities: A financial burden on the healthcare system* **Christina Agius, Fiorella Borg**
10:30	*Support received by clinical mentors in undergraduate nursing education.* **Jonathan Vella, Marisa Vella, Kevin Holmes, Francesca Micallef**
10:40	*Sport, Small States and Malta: A Qualitative Case Study.* **Corissa Vella White**
11.00-11.30	**Coffee Break/Poster Session**
SESSION 2 PAGE 25	*Chair: Massimo Pierucci*
11:30	*'Wait until dark' – a study of the theme of fear in theatre* **Tyrone Grima**
11:45	*Exploring the role and function of chaplaincy services in MCAST.* **David Callaby Floridia**
12:00	*Preparations for Social Research on The Experience of Educators in Malta who Identify as LGBTQ+: a Longitudinal Study.* **Heathcliff Schembri, Kenny Muscat**
12:15	*Examining the effect of Government Expenditure in Education on Income Inequality: A Panel Data approach* **Ayrton Zarb**
12:30	*Simple Pin-Plate Electrode Configuration for Targeted Electroporation.* **Anoop Menachery**
13.00-14.00	**Lunch Break/Poster Session**
SESSION 3 PAGE 30	*Chair Suzanne Maas*
14:00	*The Role of Physical Education in promoting Mental Health and Well-Being - the perception of PE teachers and Sports lecturers.* **Anna Maria Gatt**
14:20	*Youths in Supported Accommodation (in Malta).* **Joanna Abela Cassar, Christopher Bonnici, Janice Fenech Scicluna**
14:50	*InclusiPHE - Erasmus+ Project.* **Antonella Brincat**
15.00-15.30	**Coffee Break/Poster Session**
15.30	*Workshop*

PARALLEL SYMPOSIUM	Quality Pedagogy and Effective Learning *Room: Conference Hall 3*
SESSION 1 PAGE 34	*Chair: Edwin Zammit*
9:30	*Welcome Address* **Paula Grech Bonnici -** *Director of IAS*
9:40	*Investigating SoB as an online educator during the COVID-19 pandemic and its effects on virtual-based teaching: An Autoethnography* **Cassandra Sturgeon Delia**
9:55	*Challenges and Suggestions to Deliver a Degree in a Prison Context: An adaptation of a current BA in Fine Art.* **Pierre Mifsud, Carmen Aquilina**
10:10	*Building Innovation Work Behavior- Curriculum* **Robert Cassar**
10:25	*Is Block-Based Programming an Effective Teaching Tool?* **Oriana Ebejer**
10:40	*Preventing Dropping Out in Post-Secondary Education (focusing on lower levels at ICS)* **Marilyn Pace Mintoff**
11.00-11.30	**Coffee Break/Poster Session**
SESSION 2 PAGE 41	*Chair: Nika Levikov*
11:30	*Long-term cooperation and training within the aquaculture sector* **Kimberly Terribile**
11:45	*Embracing an Inclusive Practice in the Early Childhood Cycle - Educators' Perspectives* **Christine Schembri**
12:00	*DASARTS in Malta* **Rochelle Gatt**
12:15	*The Record Producer in Maltese Popular Music* **Rene' Mamo**
12:30	*Gender Equality Teaching in Early Years* **Beverley Abela Gatt**
13.00-14.00	**Lunch Break/Poster Session**
SESSION 3 PAGE 48	*Chair Christine Zerafa*
14:00	*The impact of Enterprise Education on Students pursuing Professional Higher Education in Malta: A Grounded Theory Study* **Ronald Aquilina and Alex Rizzo**
14:20	*Factors Contributing to the Formation of Education Student Identities as Future Professionals* **Nadia Maria Vassallo, Kenny Muscat**
14:40	*Improving Geriatric Patient Satisfaction: Development of a High-Fidelity E-learning Simulation Course to Develop Intercultural Skills in Geriatric Patient Care – GnurseSim* **Neville Schembri**
15:00-15:30	**Coffee Break/Poster Session**
15.30	*Workshop*

PARALLEL SYMPOSIUM	Environmental and Cultural Sustainability *ROOM: AUDITORIUM*
SESSION 1 **PAGE** 54	*Chair: Lorna Bonnici West*
9:30	*Welcome Address* **Mario Cardona** - *Deputy Principal VPET-Technology and Applied Sciences*
9:40	*Are dolphins on the increase? Integrating Scientific and Local Ecological Knowledge* **Kimberly Terribile**
10:00	Continuous Assessment of Pollutants and Environmental events via Satellite data (CAPES) **Frankie Inguanez, Daren Scerri, Juan Jose' Bonello**
10:20	*Maltese wooden balconies: a technical and scientific study.* **Michael Formosa**
10:40	*The EIT Urban Mobility Hub: Promoting a transition in transport in Malta* **Suzanne Maas**
11.00-11.30	**Coffee Break/Poster Session**
SESSION 2 **PAGE** 61	*Chair: Gonca Kara*
11:30	*The use of mycorrhizae and biodegradable mulch in Maltese agriculture.* **John Galea**
11:45	*Gigging-4-Living - Supporting creative solutions to sustain artists working in the gig economy* **Christine Zerafa, Christine Vella, Moritz Zavan Stoeckle**
12:00	*Assessing climate and environmental risks for the Mediterranean terrestrial ecosystems.* **Mario V Balzan**
12:15	*Pre-processing Water Consumption Data* **Andrew Cortis, Alex Rizzo, Christian Camilleri and Stephan Riolo**
12:30	*The Development of Pandemic Art : 1300-1900* **Clint Calleja**
13.00-14.00	**Lunch Break/Poster Session**
SESSION 3	
15:00-15-30	**Coffee Break/Poster Session**
15:30	*Workshop*

PROGRAMME OUTLINE – DAY 2

PARALLEL SYMPOSIUM	**EMERGING TECHNOLOGY AND CREATIVE INNOVATION** *ROOM: CONFERENCE HALL 1*
SESSION 1 PAGE 68	*Chair: Nika Levikov*
9:30	*Welcome Address* **Stephen Sammut** – *Director of the IET*
9:40	*Robotics and AI courses in the classroom* **Thomas Gatt**
9:55	*The Hydrodynamics of Multiphase Swirl-Induced Flows* **Darren Misfud**
10:10	*Virtual Reality Learning environment for Schizophrenia* **Mark Spiteri**
10:25	*Erasmus+ ECOdesign4EU: Training Contents and Joint VET Qualifications on Ecodesign for Creative and Cultural Industries* **Owen Sacco**
10:40	*The Impact of the Developments of Printing on the Decoration of Books of Hours as Illustrated in Examples found in Collections in Malta* **Martina Caruana**
11.00-11.30	**Coffee Break/Poster Session**
SESSION 2 PAGE 74	*Chair: Lorna Bonnici West*
11:30	*Bus ID System Aiding Visually Impaired Persons* **Joseph Attard**
11:45	*The Electric Vehicle Scenario* **Malcolm Caligari Conti**
12:00	*Applied Research in Electric Vehicles (EV).* **Andy Bugeja**
12:20	*IoT and Drones for Agriculture* **Steve Zerafa**
13.00-14.00	**Lunch Break/Poster Session**
14:00	*Workshop*
15.00-15.30	**Coffee Break/Poster Session**
15.30	*Workshop*

PARALLEL SYMPOSIUM	**SOCIAL WELL-BEING, SPORTS AND HEALTH** ***ROOM: CONFERENCE HALL 2***
SESSION 1 PAGE 79	*Chair: Suzanne Maas*
9:30	*Welcome Address* **Tatjana Chircop** - *Deputy Principal VPET-Arts and Social Sciences*
9:35	*Queering Francis of Assisi.* **Tyrone Grima**
9:55	*Investigating Modifiable Health Behaviours in MCAST Students.* **Johann Zarb**
10:15	*Promoting Physical Activity and Sport Participation with Individuals with Intellectual Disability (ID) in an Inclusive Setting.* **Amanda Dimech**
10:30	*Educator's Experiences of Managing Workplace Stress and Burnout in a Post-Secondary Vocational Institution.* **Luke Mallia Azzopardi**
10:45	*Exploring new pathways of gainful employment for Persons with Intellectual disabilities within the Tourism sector in Malta: Promoting cultural tourism and ethical dining for locals and tourists. A Feasibility study.* **David Callaby Floridia**
11.00-11.30	**Coffee Break/Poster Session**
SESSION 2 PAGE 84	*Chair: Gonca Kara*
11:30	*A systematic review of the association of religiousness to children's prosocial behaviour.* **Isabelle Zammit**
11:45	*MCAST Journal of Applied Research & Practice – Special Issue on Sport, Exercise & Health* **Renzo Kerr Cumbo**
12:00	*Mental health and social media: The lived experiences of MCAST students* **Matthew Borg**
12:15	*Healthy Dating* **Sherika Micallef Seychell, Delicia Farrugia**
12:30	*Complementing Collaborative Practices: A Case Study in a Secondary Church School Setting* **Heathcliff Schembri, Claire Sciberras**
13.00-14.00	**Lunch Break/Poster Session**
14:00	*Workshop*
15.00-15.30	**Coffee Break/Poster Session**
15.30	*Workshop*

PARALLEL SYMPOSIUM	**QUALITY PEDAGOGY AND EFFECTIVE LEARNING** *ROOM: CONFERENCE HALL 3*
SESSION 1 PAGE 91	*Chair: Gonca Kara*
9:30	*Welcome Address* **Martina Caruana** – *Director of the ICA*
9:40	*Encouraging Multicultural Education through Modern Outdoor Sustainable Set-ups for Early Childhood* **Simone Restall**
10:00	The Role of Entrepreneurship as a subject in Vocational Education and Training Context: Taking MCAST as a case study **David Pace, Ivan Briffa**
10:20	*EIT Climate KIC Malta Hub* **Nika Levikov, Suzanne Maas, Gonca Kara**
10:40	*The acceptance of learning management systems and video conferencing technologies: Lessons learned from COVID-19* **Adriana Camilleri, Mark Camilleri**
11.00-11.30	**Coffee Break/Poster Session**
SESSION 2 PAGE 97	*Chair: Suzanne Maas*
11:30	*Enhancing Student Engagement Through Application of an Integrated Simulation and Assessment in Donning and Doffing for Healthcare Professionals (iSADD)* **Neville Schembri, Phyllis Farrugia Abanifi, Jonathan Vella, Dorianne Cachia**
11:55	TRinE - Telepresence Robots in Education **Andre Attard, Clifford De Raffaele, Edwin Zammir, Abduarahman Bazena**
12:15	*Triggers of Worry and Stress in Young Students: Presenting Findings* **Melanie Darmanin**
12:35	*Writing that dissertation: exploring the academic writing challenges of undergraduate IBMC students* **Melissa Joan Bagley**
12:50	*Reinventing the teaching of mathematics post-COVID-19* **Marouska Zahra Micallef**
13.00-14.00	**Lunch Break/Poster Session**
14:00	*Workshop*
15:00-15:30	**Coffee Break/Poster Session**
15:30	*Workshop*

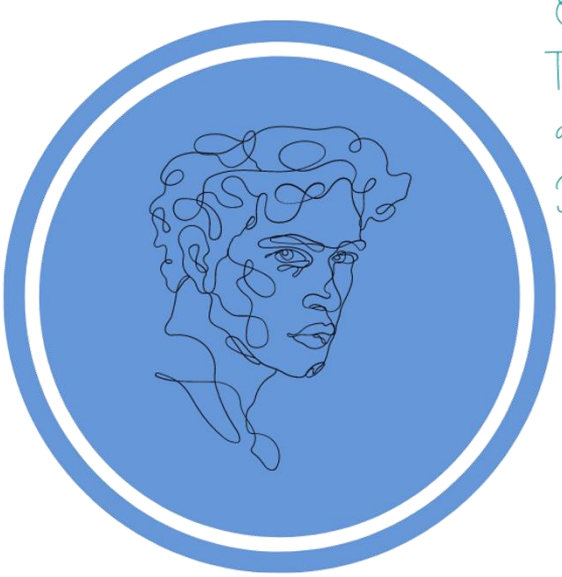
PARALLEL SYMPOSIUM	**ENVIRONMENTAL AND CULTURAL SUSTAINABILITY** ***ROOM: AUDITORIUM***
SESSION 1 **PAGE** 104	*Chair: Lorna Bonnici West*
9:30	*Welcome Address* **Karl Camilleri** - *Deputy Director of the IBMC*
9:40	*The media preferences of Maltese Millennials* **Carmelina Frendo**
10:00	A preliminary study on the effect of different feeding regimes on the physiochemical characteristics of local sheep's milk. **Joseph Jason Abela**
10:20	*Flight over fields; bats and birds in Mediterranean agricultural landscapes* **Ian Falzon**
10:40	*Identification of selection criteria for the Black Maltese Chicken breeding program* **Paul Spiteri, Robert Debono**
11.00-11.30	**Coffee Break/Poster Session**
SESSION 2 **PAGE** 110	*Chair: Nika Levikov*
11:30	*Recognition of Underutilised Maltese Marine Species* **Kimberly Terribile, Juan Jose' Bonello, Daren Scerri, Frankie Inguanez**
11:50	*IMPACT - Identifying Microplastic Hotspots in the Maltese Waters* **Juan Jose Bonello, Frederick Lia**
12:20	*MCAST Energy contribution towards EU 2050 climate-neutral vision* **Brian Azzopardi, Somesh Bhattacharya, Marcin Pinczynski**
13.00-14.00	**Lunch Break/Poster Session**
14:00	*Workshop*
15:00-15:30	**Coffee Break/Poster Session**
15:30	*Workshop*

Research & Innovation EXPO 21

ABSTRACTS: DAY 1

Monday 20th

MCAST



Emerging Technology and Creative Innovation

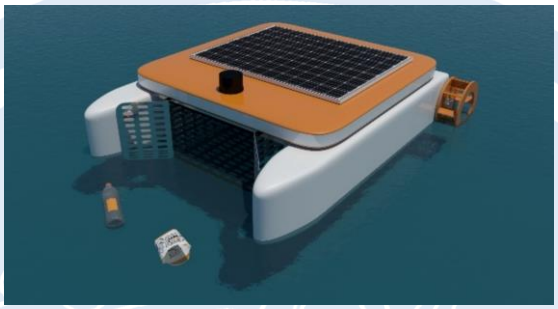
The Emerging Technology and Creative Innovation research theme encompasses projects from various institutes, with the main objective addressing research and innovation in technology and the creative arts. Applied Research projects which are currently taking place at MCAST focuses on the Artificial Intelligence, Robotics, 3D Printing, Distributed Ledger Technologies, Cyber Security to Games Research and span from the development of augmented reality platforms, to the development of wearable sensor technology, while also hosting creative projects leading to the development of new methodologies in the performing arts, photography and graphic language. Innovative research in the creative arts finds its focus in practice-based research, whereby MCAST researchers use their artistic practice to develop innovative methods that contribute to enriching artistic detail, enhancing audience experience, while also leading to new methodologies that expand the repertoire of international artistic practices.

SESSION: 1

A study into the design of an autonomous sea-faring drone for the collection of floating waste plastics from ports and harbours.

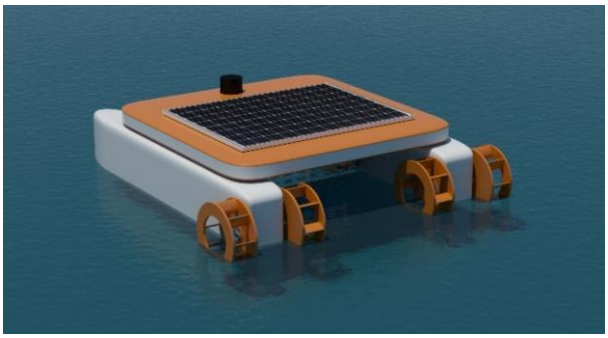
Mark Theuma, Suzanne Psaila
Institute of Creative Arts

The relatively low cost, durability and versatility of plastics make them amongst the most widely produced and used materials. The production of plastics steadily increased since the 1950s, reaching a staggering 368 million metric tons produced in 2019 alone. The market value of plastics grew proportionally (Tiseo, 2021), so the demand and production are not expected to slow down any time soon.



The fact that plastics are used in an extensive array of products, maintains an exceedingly high demand. According to Tiseo (2021), in several instances, traditional materials such as wood, metal and glass, have been displaced by plastics. Plastic variants such as polyesters are used for fabrics and textiles, polycarbonates for eyeglasses and compact discs, and polyvinylide chloride for food packaging, amongst other. A multitude of other uses made humanity ever more dependent on this group of materials. This proliferation of plastic use is having dire consequences on the environment.

The inability of plastics to biodegrade naturally, ranks them high amongst the largest polluters (Prorokova, 2019). Plastic waste has progressively transformed our environment. Millions of tons increasingly pile up in unsightly landfills where they remain for tens or even hundreds of years, potentially leaking pollutants into the soil and the water table. High quantities end up in the sea and oceans after being carried by the wind or through rivers and waterways. An estimated 4.7 to 12.7 million tons end up in the oceans every year, which is predicted to triple by 2025



(Thompson, 2018). Plastics cause inconceivable damage to marine life. Numerous images and videos portray turtles entangled in nylon nets or chocking on plastic bags, plastic rings wrapped around the necks and beaks of sea birds, and beached whales lying dead with several kilograms of ingested plastic clogging their stomachs, completely starved from nutrients. Plastics are not constrained to the ocean surface. Acrylic, Polyester and other synthetic fibres, together with microbeads, often remain suspended at various depths. They are so small that they end up in the sea with treated sewage as they cannot be filtered with the current technology. Larger plastics break down by time forming micro plastics. Such small elements are easily ingested by fish that, in turn, may end up consumed by humans.

This research will look into the design of a small-scale, autonomous, sea-faring drone that will provide a solution for the collection of floating waste plastics at source. Designed to operate in ports and harbours, the electric catamaran will be able to navigate around moored boats and in sheltered waters, using a series of on-board, electronic devices and motors. The autonomous drone will be able to operate as standalone, or collectively in swarms, using various modes of operation that enable the coverage of large areas within ports and harbours. The system aims to capture seaborne plastics before they reach the open sea by scooping and retaining them within a perforated, stainless-steel bin, located between the twin hulls, as it propels forward. The research will look into materials, technologies, and further functions that could be performed by the drone such as machine learning, use of AI, image recognition, the monitoring of the water quality, IoT data transfer, amongst other.

RELAR - Remote learning and examination by using AR in maritime VET education

Christian Camilleri
Institute of Applied Sciences

RELAR project aims to create a crisis-proof resilient maritime VET ecosystem by enabling remote learning and examination using Augmented Reality. The project is driven by a consortium formed by European VET organizations and HEI and will tackle all the deficiencies unearthed by the COVID-19 crisis focusing on transferring the expertise and knowledge of industrial organizations in improving security, safety and efficiency by empowering frontline connected workers with remote technology.

The maritime VET education ecosystem has to become more resilient to crisis and improve his adaptation capacity to forced shifts imposed by force majeure. Being tightly linked to other ecosystems having a major role in economy and in society as a whole (port ecosystem, national, European and international education ecosystem) maritime education have to be capable to absorb social shocks generated by crisis situations and to ensure the continuity of the learning process. This project addresses key challenges of the maritime and port education ecosystem caused by structural change due to new digital technologies.

The project will mirror the new paradigm “expert - frontline worker” proposed by Industry 5.0 concept to a next-level “teacher - student” paradigm for vocational education and training. Teachers will wear the augmented reality device for examining remotely the students by evaluating the quality of the instructions students gave. Students will enhance their technological skills and hands-on experience by using the same augmented reality device and executing tasks being remotely guided by the teacher. Both teachers and students will have the roles of expert or frontline worker depending on the objective: examination of learning.

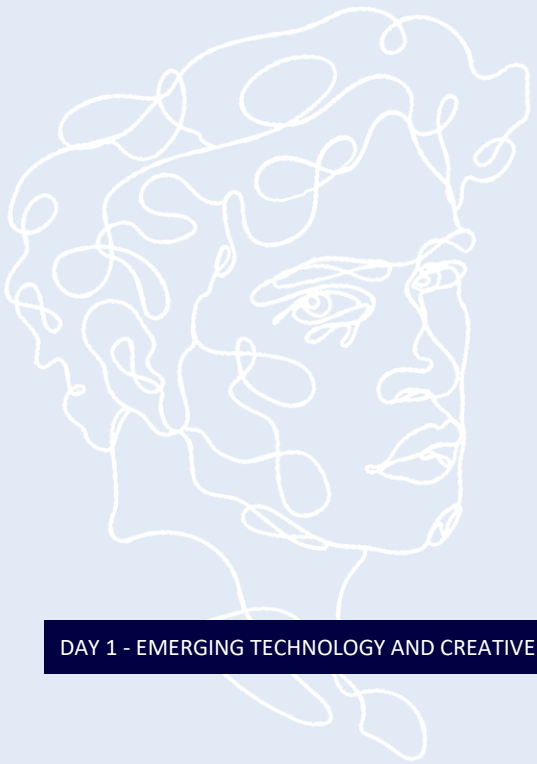
The adaptation of comic language to digital platforms: The creation of a graphic novel for print and online

Simon Callus
Institute of Creative Arts

McCloud (2000) describes how sequential art has changed its shape to fit into the print format but gives examples from history explaining how it is not the only way it can be displayed, and is definitely not defined by it. With the growing of the internet and digital landscape, all art forms will stop being associated with one particular medium but will be reduced down to one "simple irreducible concept, one that distinguishes it from all others" (McCloud, 2000). To McCloud, for comics, this is the juxtaposition of images; the "spatial relationship" of one element with every other element at all times. If comics are transported online by breaking down the multiframe, making each panel visible by itself, "the very fabric of comics' core identity" is torn down, according to McCloud.

Eisner (2008) does not see the breakdown of comics into panels as a destruction of what defines comics, but as one of the ways in which the medium has to be changed for the new platform, similar to the repositioning of panels to fit the horizontal format of a screen, as opposed to the traditionally vertical one of the page. Eisner does say however that without the multiframe, "the traditional function of the panel as a punctuation or as an emotion-orientation no longer applies" and goes on to say that the focus then falls to the acting and scene composition. This shows that even in the simplest form of adaptation online, the comic creator needs to think of the new medium.

Eisner introduces the idea of the “infinite canvas”, which is then explored further by McCloud (2000). Looking at the screen as a page has its limitations, but looking at it as a window which could be moved along the surface of the comic could allow a comic “as wide as Europe or as tall as a mountain” to be created. This creates a large number of possibilities in the way comics are created and in the different levels of interaction possible to the readers. By analysing online examples such as “To Be Continued”, “xkcd - Click and Drag”, and “Marvel Infinity” the potential of digital web based comics can be explored. By comparing the print and web versions of the same comic such as “Into the Woods”, the differences and strengths of the two media become more evident, aiding in the decisions taken in the creation of a graphic novel for both print and the screen.



Personalised Semantic User Interfaces for Games

Owen Sacco
Institute of Information And Communication Technology

Players interact with games through user interfaces. Although user interfaces are similar in each game, these are manually developed each time for each game. The Web contains vast sources of content that could be reused to reduce the development time and effort to create user interfaces for games. However, most Web content is unstructured and lacks meaning for machines to be able to process and infer new knowledge. In this presentation, we present a vocabulary that defines detailed properties used for describing user interfaces for games, and a vocabulary that defines detailed properties used for describing player's user interface preferences. Through these vocabularies, semantically-enriched user interface models can be used for automatically generating personalised user interfaces for games

SESSION: 2

Chatbot in Education as an Assistant Tutor

Silvio Nocilla
Institute of Information And Communication Technology

This research study refers to the effects of human-computer interactions in education investigating, effectiveness, efficiency, satisfaction, and limitations using Chatbots in education as assistant tutor. Chatbot systems are in trend and are being used on many websites and social media as a means of Artificial intelligence (AI) communication tool. According to A. Vaish, stated in (Khan, et al., 2019) “Globally, the Chatbot market has seen explosive growth with a growth rate of 35% CAGR”. The aim of this research is to identify various Chatbots in use within the educational environment, investigating effectiveness, efficiency, satisfaction, and limitations. Through evidence-based practice (EBP).

Days Blending Together

Angela Cassar
Institute of Creative Arts

"The days blend together, the months lurch ahead, and we have no idea what time it is. The virus has created its own clock" (Pardes, 2020). Our perception of time has been distorted throughout the past year and a half due to the pandemic. In her research entitled 'The passage of time during the UK Covid-19 lockdown', psychologist Dr Ruth S. Orgden, has shown how 80% of participants in the study experienced significant changes in the way they perceive the passage of time during the pandemic (Orgden, 2020). Whilst our perception of time has shifted, the question, 'How can one attempt to perceive the illusion of flow of time through still imagery?', became more relevant. Throughout the research, various approaches were taken to explore showing the illusion of time in one image through physical and digital manipulation.

A key figure in the research was theoretical physicist Carlo Rovelli, in his book 'The Order of Time' he states that, "The difference between things and events is that things persist in time; events have a limited duration" (Rovelli, 2017). This idea shaped the visual language of the project which aimed to depict the limited duration of our experiences into one image.

Ultrasonic data transmission link for microscale chloride ion detection sensors.

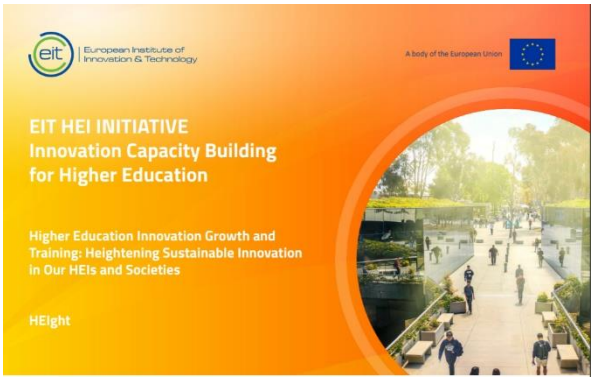
Stephen Sammut
Institute of Engineering and Transport

Chloride ions, when present in the concrete's pore solution, readily attack the steel rebar's passivation layer. This in turn initiates rebar corrosion and hence structural deterioration. For an effective structural health monitoring system, sensors should be installed inside the structure itself, thereby sampling the pore solution as close to the rebar as possible. To make possible this proximity in placement, a micrometre sized chloride sensory system is being developed. This device is envisaged to be a Micro Electro-Mechanical System (MEMS). MEMS have been selected for this application due to their very small size, which allows their embedding close to the rebar, and their capacity for being mass produced.

Embedded micro devices would need to communicate with each other by using ultrasonic radiation, thus forming an effective wireless sensor network. This project evaluates the feasibility of using ultrasonic radiation emanating from a Piezoelectric Micromachined Ultrasonic Transducer (PMUT) as a means for transmitting data through the solid concrete structures. This enables embedded single chip MEMS chloride detection sensors, to communicate with each other. The feasibility of using these devices is evaluated by studying the propagation of the ultrasonic radiation, through the concrete structure. Studies conducted using Finite Element Models (FEM) will be examined in this presentation.

Heightening Sustainable Innovation in Our HEIs and Societies

Gonca Kara
Applied Research And Innovation Centre



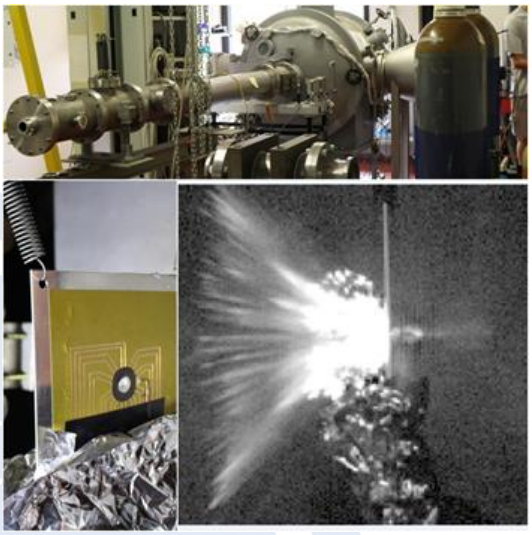
HEIght is an initiative of a pan-European consortium of four forward-thinking higher education institutions (HEIs) and one actor from another side of the knowledge triangle, united to cultivate a mutually beneficial and collaborative consortium. It leverages existing innovation and entrepreneurial knowledge of all 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 the consortium's 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 develop innovation and enterprise, these activities support the development of academic and non-academic staff and students. Across two phases, HEIght achieves key performance indicators 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 Knowledge and Innovation Communities, 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 EU Member States. 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. In addition, a 'train the trainer' 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.

Development of a hypervelocity impacts facility at MCAST

Leonardo Barilaro
Institute of Engineering and Transport

In recent years Malta started to establish its role as one of the emerging nations in the Space Sector, supporting sustainable development and economic growth. The Malta Government's aim is to create a regulatory framework and incentives which improves the nation attractiveness and capability to capitalise upon commercial activities related to the outer space. Through the promotion of Research and Innovation and STEM subjects which are vital for the operation of space activities, Malta is developing synergies with EU-level regulations concerning space policy development and space research support.



In this framework, the Malta College of Arts, Science and Technology (MCAST) started its Aerospace Program in October 2020 and in October 2021 kicked-off the related MSc in Aerospace Engineering. MCAST vision is to create a center of excellence in the sector of Technology and Measurements for Aerospace with the aim of boosting the local academic research and industry, increasing international collaborations and enhancing the brand of the Institution. The focus of the research presented is on the understanding of material properties subjected to impact situations, pivotal in different aerospace applications to guarantee safe operations. To address this topic, specific tools are required to evaluate the impact damage on structures and systems. Light-Gas Gun (LGG) facilities can be applied to simulate different scenarios, varying the ballistic impacts conditions. Common types of light-gas guns are the single-stage LGG, two-stage LGG, and the shock tube. Single-stage LGG despite being relatively simple in concept, consisting of one pressure reservoir that accelerates a projectile through a barrel to the target, is a cutting-edge technology that presents unique mechanical challenges.

The conceptual evaluation of a single-stage LGG facility in Malta, done in cooperation between MCAST and the Centre of Studies and Activities for Space "G. Colombo" of University of Padova is described, and the possibilities and limitations of developing a single-stage light-gas gun to test materials for impact resistance are investigated. For this, the achievable projectile velocities with different driving gases, pressure reservoirs, and barrel lengths are analysed, together with a preliminary evaluation of the business opportunities in the growing aviation market and the emerging space sector in Malta.

SESSION: 3

Application of WRF-Chem for Dust Prediction

Joseph A. Zammit, Joshua Bugeja
Institute of Engineering and Transport

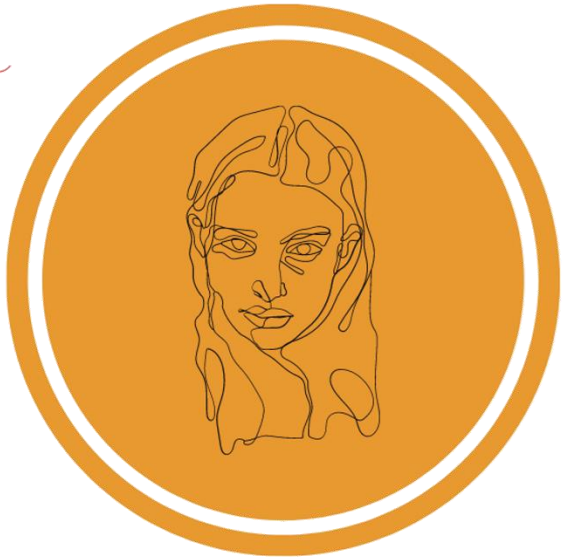
Air pollution from particulate matter is a global health problem. Dust particles are considered a source of natural pollutants. Most of the mineral dust particle emission is from the Sahara desert which accounts for 55% of the total emitted dust particles. When dust from the Sahara desert reaches the Maltese islands this results in atmospheric 'haze' which causes problems for people with respiratory conditions, low visibility and lower output from PV panels. Dust emissions from this region have been only studied using numerical models with little input from actual observations. 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. The presentation will give an update on the status of the project and the modelling techniques being developed.

Integrated Simulation and Assessment in Donning and Doffing for Healthcare Professionals (ISADD)

Daren Scerri, Neville Schembri, Gerard Said Pullicino
Institute of Information And Communication Technology

There is an unprecedented increase in the requirement for healthcare staff trained in infection control principles due to the COVID-19 pandemic. This project presents an example of a technological solution to correctly explain the sequence of donning and doffing Personal Protective Equipment (PPE) in preparation for dealing with patients who may be infected with a virus. Image processing and machine learning techniques are used to identify articles of PPE as they are worn, and an innovative client server architecture is used to mitigate performance issues given the need for near real time response (NRT). A powerful inference server is used to identify PPE and human activity, while the donning/doffing sequence is monitored by the client application. If the user does not follow the correct steps, the user is notified regarding the missed step in the sequence and has the option to begin the process again. A technical evaluation of the effectiveness of the identification of PPE based on image processing gives a technical insight into how correctly image processing is being carried out, while a qualitative evaluation of the donning and doffing process with qualified infection control staff, as well as nurse trainees is also being carried out to gain an understanding of the possible acceptance of the application.

Social well-being, Sports and Health



Social well-being, sports and health research are interlinked research areas of focus at MCAST. Research in this field is highly valuable not only for the academic audience and other researchers but also to society at large. The Health and Social Care Department look at the sociological aspect. Within this sphere research is currently being undertaken in collaboration with various entities working in the community, including a parish community and the Standards of Care. Another project is putting focus on mental health.

Research under the health sphere at MCAST is rapidly expanding, and is contributing but is not limited to, areas of public health interventions, investigation of aspects of health practices which could lead to recommendations in change in policies, and exploration of the concept of nursing outreach in Malta. Health research is not only limited to the healthcare professional arena, but is also being extended to the educational realm, especially in the area of transcultural nursing research and education. Research activities under this thematic area has seen collaboration with both national and international partners and a number of submissions for external funding.

At MCAST we are also focusing on Sports Research with a special focus on the relation with the Health aspects. In this sphere there is an active collaboration with the Malta Football Association and the Special Olympics Committee amongst others. Researchers are also involved in a European cooperation project which looks at how physical activity can be a means to improve health.

SOCIAL WELL-BEING, SPORTS AND HEALTH

SESSION: 1

Emotional Eating, Stress and Coping in College Students during the COVID-19 pandemic

Daniela Cassola
Learning Support Unit

Previous research has established that there is a significant positive relationship between perceived stress and emotional eating behaviour (Nguyen-Rodriguez et al. 2008). This eating behaviour is believed to be associated with excessive snacking, weight gain, and bingeing (van Strien & Oosterveld 2008).

During the early phases of the COVID-19 pandemic there has been a high occurrence of self-reported psychological distress symptoms (Bemanian et al. 2021). COVID-19 related worries as well as the negative effects resulting from isolation and lockdown on emotional wellbeing and eating behaviour are associated with increased emotional eating (Bemanian et al. 2021; Cecchetto et al. 2021).

Coping may serve as a mediator between perceived stress and health outcomes such as dietary intake in adolescents (Laitinen et al. 2002; Dinsmore & Stormshak 2003). Previous studies have found that the lack of adequate coping skills puts adolescents at risk of poor academic performance, psychological distress, suicidal attempts, anxiety, depression, smoking, substance abuse, high-risk sexual behaviours, conduct problems, violence, poor metabolic control and a lower degree of diabetes-related quality of life, overeating, unhealthy eating, eating disorders and obesity (Garcia 2010; Graue et al. 2004; Horwitz et al. 2011; Martyn-Nemeth et al. 2009; Fryer et al. 1997; Frydenberg & Lewis 2004). Researchers have found that, in response to a stressful situation, an adolescent's use of functional coping strategies is associated with fewer negative outcomes than the use of dysfunctional coping strategies, such as less general health problems, less mental health problems and less eating and dietary problems (Elgar et al. 2003; Steiner et al. 2002). If the coping skills of an adolescent can be improved, more positive health

outcomes should, therefore, be expected as the adolescent would perceive and react to a stressor in a different manner (Garcia 2010).

Many of the studies that have investigated the relationship between perceived stress, coping and eating behaviours in adolescents have concluded that future research needs to focus on interventions that aim at improving coping skills and stress management skills as a means to decrease emotional eating (Bennett et al. 2013; Nguyen-Rodriguez et al. 2008),

Since higher levels of perceived stress have been found to be related to higher levels of emotional eating, it is important to examine the impact of the COVID-19 pandemic on college students in terms of stress and eating behaviours.

The aims of the proposed study are to:

- examine the relationship between emotional eating, perceived stress, coping and the impact of the COVID-19 pandemic in college students
- devise a model to guide the development of effective college-based services/intervention to assist students in decreasing emotional eating behaviours and perceived stress levels and increasing functional coping strategies

Methodology:

Cross-sectional data will be collected from MCAST Students (age 16 +) using an online questionnaire with self-report measures examining perceived stress, coping responses, and eating behaviours.

Boutique Hotels in the Three Cities – what would make locals prefer boutique hotels in this area of Malta over other areas and over five-star luxury hotels?

Paul Camilleri
Institute of Business Management and Commerce

The aim behind this research is to understand better the pattern of local tourism to the Three Cities. In the past local tourism always meant Maltese people crossing over to Gozo. However, over the past years this trend has changed whereby the number of people staying in hotels in the mainland itself has steadily increased. This was mostly brought by the introduction of full-board hotels and boutique hotels.

The first part of this research (tackled in the first semester) focuses on understanding the defining characteristics of a boutique hotel and the main differences from other hotels. In the literature review I outlined the history of the development of boutique hotels in Malta. Whilst exploring the number of boutique hotels in the Three Cities and their occupancy, I am also currently working on a quantitative research. In this research I am questioning boutique hotel owners in The Three Cities and also a similar number of boutique hotel owners in the area of Sliema to gain a better insight into the differences of the tourism concept in these two different touristic destinations in Malta.

The second part of the study (taking place in the second semester) will inolve a quantitative type of research which tries to identify the willingness of Maltese people to book stays in boutique hotels in the Three Cities.

Schizophrenia and its co-morbidities: A financial burden on the healthcare system

Christina Agius, Fiorella Borg
Institute of Community Services

Mental health problems affect about 84 million people across the EU. This is more than one in every six citizens (The European Commission, 2019). The World Health Organization (WHO) reports that over 20 million people suffer from schizophrenia world-wide.

Schizophrenia is a severe mental disorder in which the service user experiences disruptions to his/her thought processes, to the way he/she perceives the world around him/her, to his/her emotional responsiveness, and to any social interactions that he/she has (National Institute of Mental Health, 2018).

Whilst schizophrenia is not as common as other mental health problems such as anxiety and depression, nonetheless by far this condition is the most expensive to treat. Financial costs associated with the condition are high when compared to the condition itself (and its health care requirements) and any co-morbidities, especially when factoring in lower productivity and other needs beyond basic health care (such as social care) (Desai, et al., 2013). Considering the high probability of one or more relapses or problems due to substance abuse following initial diagnosis, the cost of healthcare for this condition continues to rise (Grech & Micallef Trigona, 2020).

Considering a more holistic approach, and therefore looking into ameliorating the lifestyle of these patients could alleviate the financial burden of treating the negative symptoms and the unhealthy habits that come with it.

Support received by clinical mentors in undergraduate nursing education.

Jonathan Vella, Marisa Vella, Kevin Holmes, Francesca Micallef
Institute of Applied Sciences

Undergraduate nursing education involves the development of safe and effective practice through theoretical and clinical experience. This requires effective relationships between the higher education institution (HEI), clinical mentors and students.

Literature reports that mentors hold various views of their role including knowledge of pedagogy and fluency of reflection, evaluation, and assessment skills. However, other evidence claims that mentors are inadequately prepared to work with students secondary to the unclarity of role expectations, role conflict, work overload, and lack of support. The clinical mentor is crucial to ensure that students are fit for practice and thus need to be supported throughout.

In its fifth year, the Northumbria University BSc (Hons) in Nursing Studies in conjunction with the Malta College of Art, Science, and Technology is facing a challenge: that of forming new foundations and frameworks for the future of nursing practice. This includes adequate support for clinical mentors.

This purpose of this study is to explore the perceptions of support received by clinical nursing mentors whilst mentoring undergraduate nursing students. This will be explored by addressing the following objectives:

1. Explore the clinical mentors' understanding of the concept of support
2. Explore the clinical mentors' perception on the current level of support they receive
3. Identify any challenges and barriers clinical mentors experience whilst mentoring undergraduate nursing students.
4. Explore the type and level of support clinical mentors require to effectively mentor undergraduate nursing students.

This research will serve to support the main research design of a project that will create a supporting program for clinical nursing mentors.

Clinical nursing mentors employed with the MCAST with a minimum of twelve months experience of mentoring will be invited to participate in a semi-structured interview which is informed by recent research about the topic. The data will be analyzed thematically using an inductive approach where researchers, without any pre-conceptions, immerse into the data for generation of themes. This research is

subject to ethical approval from the MCAST Research Ethics committee and will adhere to all ethical research principles.

Sport, Small States and Malta: A Qualitative Case Study

Corissa Vella White
Institute of Community Services

In order to analyze the set of data gathered, the six-stage by Braun and Clark was used from the semi-structured in-depth interviews collected from various participants. All the participants in this study were chosen purposefully by the researcher.

The analyzed data will be discussed in the following categories;

1 – PE teachers Category (known as micro-level)

2 – Athletes and Coaches Category (known as micro-level)

3 – Meso participants Category

The categories identified above are themed using Thematic Analysis whereby common codes have been identified and clustered. Themes derived from these categories were based on a theoretical approach called the SPLISS framework, which was used as a benchmark for this study. So far, the categories have been analyzed according to the SPLISS framework and a first draft of the report has been written. There is more polishing to be done in order to present this report as it is still in its infant stage. The meso category has yet not been finalized. A general overview of each category will be presented. The early findings identified so far will be presented during the EXPO.

SESSION: 2

‘Wait until dark’ - a study of the theme of fear in theatre

Tyrone Grima
Institute of Creative Arts

This project will be done in collaboration between myself and MADC (Malta Amateur Dramatic Club), focusing on a play ‘Wait until dark’, a critically acclaimed play by Fredrick Knott, which I will direct for MADC in April 2022 at its clubrooms. This theatrical work falls under the thriller genre and deals with the story of a blind woman who has to defend her apartment from a gang of criminals who break into her property to steal a doll, containing drugs in it. Fear is an emotion that has rarely been explored in the local theatrical sector. In the pre-production stage, through interviews, reading of literature, particularly psychological theories that examine and explore the feeling of fear, and workshops, I would like to study the theme of fear with the objective of proposing a methodology of how an audience could experience it in the theatre through a multisensory approach in an intimate setting. The study will present a case-study of the process, analysing the dynamics and the challenges that arose in the process.

Exploring the role and function of chaplaincy services in MCAST (Malta College for Arts Science and Technology).

David Callaby Floridia
Learning Support Unit

This research sets out to conduct an appraisal of the pastoral services offered by the chaplaincy in MCAST. The project is set within the context of the MCAST Act (2021) that has been released for consultation. The research aims to highlight the ways in which ways the pastoral services support the objectives highlighted by the same Act particularly found in clause 8.

The initial objectives are to record the reason for being of chaplaincy services as seen by the chaplains, who are religious people. Further into the research, the scope will develop into building a profile for the chaplaincy, I.e., by understanding how chaplaincy is perceived and by what services it provides to college. The proposed methodology is to use a grounded theory approach to collect and analyse data about the spirit by which the Chaplaincy operates. For this part of the research to be carried out the chaplains will be interviewed to see what their perspective on the work in the chaplaincy in MCAST is all about, and how they go about doing their work. They participants for this research were selected because they are the chaplains of MCAST. In total there are six (6) chaplains. Data collection will be done through semi structured qualitative interviews.

Through this research I expect to represent the voice of the chaplains, for a profiling exercise to be conducted. This will be only the first step, since after this it would only make sense to test the theory by collecting feedback from other stakeholders in MCAST. Eventually, the results will be submitted to be presented for a paper or in a conference, where the results will help other chaplaincies working in Higher education institutions.

Preparations for Social Research on The Experience of Educators in Malta who Identify as LGBTQ+: a Longitudinal Study

Heathcliff Schembri, Kenny Muscat
Institute of Community Services

This presentation will focus on the initial work being carried in preparation for qualitative research focusing on the experiences of educators in Malta who identify as LGBTQ+. As a longitudinal study over the span of three years, the researchers will collect data from educators working in Early Years and Primary Education in the first year, educators working in Middle and Secondary Education in the second year and educators working in Post-compulsory Education in the third year. The third year will also see the culmination of these three studies and identify similarities, challenges and potential ways forward, stemming from educators' experiences across the three sectors.

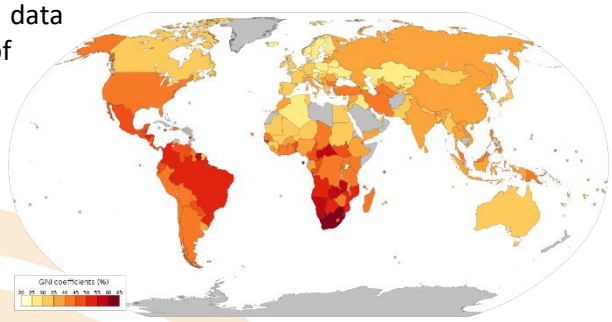
The objectives of the research are: i) to explore the double-life as educators, if any, and the external and internal factors leading to such choice/s, ii) to find commonalities and differences in the way such choice/s have been taken, iii) to identify the effects of such choices on the professional lives of these educators, and iv) to analyse the effects of such choices on the professional relationships in the workplace.

The anticipated contributions of this research are to give a voice to educators in Malta who identify as LGBTQ+, to understand their possible different lived experiences, to recommend new content and approaches which could be undertaken during pre-service and in-service teacher training, to increase awareness amongst practitioners and School Leadership Teams in education in Malta and to inform policymakers about such realities, in the hope for diverse way forwards.

Examining the effect of Government Expenditure in Education on Income Inequality: A Panel Data approach

Ayrton Zarb
Institute of Business Management and Commerce

This empirical study aims at investigating the correlation between human capital investment (measured using government expenditure in education and educational facilities) and income inequality (being the gap between the richest cohorts and the poorest cohorts in society, measured using the Gini coefficient). Using a panel dataset from several reputable sources such as the World Bank and the United Nations, 193 nations are surveyed and examined over the period 1990 till 2019 (being the most recent data available). Several variations of the proposed Ordinary Least Squares and Fixed Effects regression models have been tested in order to produce the best possible model intended to establish a relationship between the two variables whilst controlling for a set of economic, demographic and regional characteristics affecting the degree of income inequality.



Results suggest that there is a negative relationship between higher government investment in education and the Gini coefficient value. This finding supports further investment in education targeted towards lower-income households in order to help the poorest cohorts in society to climb up the economic ladder and prospect in life. Furthermore, the Kuznets inverted-U hypothesis has been approved by this study indicating that the first steps towards economic growth led to a more unequal distribution of income since the additional income starts being received by the richest cohorts. However, further development results in a more equitable society, proving the concept of Trickle-down Economics.

Simple Pin-Plate Electrode Configuration for Targeted Electroporation

Anoop Menachery
Institute of Engineering and Transport

Common commercial electroporation devices comprise parallel plate electrodes spaced millimeters apart with a volumetric capacity of hundreds of microliters. As a result, the conventional setup utilizes relatively large amounts of transfection reagents and DNA which can prohibitively expensive. The transfection efficiency and cell viability achieved by these setups also remain low due to their limitations in performing parametric optimizations via live monitoring. Some of the proposed approaches using microfluidic technology aim to counter these challenges by carrying out electroporation in enclosed microfluidic channels subject to fluid flow. However, this approach also comes along with several challenges, such as, a complex experimental setup containing fluidic channels, tubing and fluid pumps

A simple pin-plate electrode setup has been constructed in this study to reliably electroporate biological cells within droplets. The process constitutes temporary permeabilization of the plasma membrane by creating high electric fields at the tip of commercially available tapered tungsten electrodes. Subsequently, various electrical field frequencies were tested to quantify the insertion and release of dye molecules through the transient pores. Using optimized settings, we have also successfully managed to insert a plasmid to induce fluorescent protein expression, via a process referred to as transfection. The proposed design overcomes technological disadvantages of conventional cuvette-based electroporation, by creating a rapid sequentially addressable open-fluidic platform requiring small fluid volumes capable of handling multiple reagents.

SESSION: 3

The Role of Physical Education in promoting Mental Health and Well-Being - the perception of PE teachers and Sports lecturers

Anna Maria Gatt
Institute of Community Services

Statistics published by the World Health Organisation (WHO) in 2020 state that an estimation of one out of every seven adolescents worldwide suffers from a mental health condition. In an era which places Mental Health and Well-Being (MHWB) on top of international agendas and policies due to the drastic increase in the number of people suffering from mental health problems, it is of utmost importance to now shift one's focus on how to implement preventive measures amongst the general population. Schools can be an effective setting but unfortunately interventions in schools still target individual, diagnosed cases, and not the whole students' population. Physical Activity (PA) has been proved as an effective tool in addressing the MHWB of the individual and it is during Physical Education (PE) lessons, that adolescents in schools get exposed mostly to PA. Even though Mental Skills Training (MST) has been used effectively in competitive sport for a number of years, there is a lack of programmes and innovations that target the MHWB of students through PE. This study aims at addressing this gap by initially identifying the perception of local PE teachers and sports lecturers about the role of the subject in promoting MHWB. A constructive grounded theory approach was adopted for this study in which data was collected and knowledge was co-constructed with three PE teachers teaching in different contexts and a sports lecturer teaching at post-secondary level. A conceptual model emerged from an initial analytical framework that analysed the context and conditions in which the participants teach and relate to adolescents, their actions and reactions and the resulting consequences and outcomes in relation to MHWB. These findings confirm that the casual atmosphere and context experienced during PE can be a catalyst in addressing the MHWB of adolescents if the pedagogical practices implemented by teachers address the students' specific needs and preferences and equip them with life, carry-over skills.

Youths in Supported Accommodation (in Malta)

Joanna Abela Cassar, Christopher Bonnici, Janice Fenech Scicluna
Institute of Community Services

The study aims to focus on how youths are holistically being prepared to start living in supported accommodation when they turn 18 years. Therefore, by meeting the main stakeholders, the study would easily pinpoint how could the youths be better prepared in the transitioning phase into independent living. This will be done by not looking only at the obvious things such as accommodation, but also whether their interests, mental health, support from family and friends are being taken into consideration. The study will also look at whether youths are being assisted by professionals when living in independent living, whether they feel well prepared to face life, among others. These questions will guide the researchers on how they could propose the professionals and the system to prepare the youths better for independent living while mitigating youths to end up unprepared and will be a burden on society's social benefits. These conclusions would be essential in the drafting of the policy by the local standards authority.

InclusiPHE - Erasmus+ Project

Antonella Brincat
Institute of Community Services

The InclusiPHE project has as main objective to contribute to a more inclusive environment at Professional Higher Education Institutions, by creating interventions aimed at increasing non-traditional students' engagement in the life of their academic institution.

Co-funded by the Erasmus+ Programme of the European Union

InclusiPHE will focus specifically on students at PHEIs who typically attract a more diverse range of students and with a higher proportion of non-traditional students compared to more classical universities. There tend to be more adult students, lifelong learners, parent students, students from a migrant background, students with a disability, etc. At the same time, PHE curricula have specific characteristics that influence student engagement, such as shorter times spent in the institution due to many students studying at shorter courses and considerable time spent on practical placements outside the institution.

InclusiPHE will explore the engagement of students from diverse backgrounds in the life of their institutions. The project aims to improve policies, mechanisms and practices for inclusive engagement of all students regardless of their background and circumstances – to engage students in all aspects of their teaching & learning journey, quality assurance & institutional decision making, within the life of the institution and student life in the wider sense and also enabling them to fully embrace the democratic values of HE in their interactions with wider society.

MCAST is a partner in this Erasmus+ project, represented by Ms Antonella Brincat - Senior Lecturer and Institute Vocational Coordinator.

Quality Pedagogy and Effective Learning

Pedagogy training denotes the systemic collection and analysis of data connected to the field of Education, amongst which; student learning, development and human attributes, teaching methodology, teacher training, student retention, classroom dynamics, educational organisations, and educational strategies that contribute to the educational outcome. At MCAST there is a focus on Early Years research and Inclusive Education. A recurring theme within this area is multicultural education. As a higher education institution, it is only fair that a number of researchers are focusing their attention on issues related to tertiary education and how the learning experience at MCAST can be improved for students of all levels.

Learning Technologies research theme provides a setting for the sharing of the latest theories, applications, and services related to planning, developing, managing, using, and evaluating information technologies in academic and vocational education, multimedia learning, as well as other innovative educational technologies like intelligent systems, AR and VR.

QUALITY PEDAGOGY AND EFFECTIVE LEARNING

SESSION: 1

Investigating SoB as an online educator during the COVID-19 pandemic and its effects on virtual-based teaching: An Autoethnography

Cassandra Sturgeon Delia
Learning Support Unit

In early 2020, Malta's COVID-19 cases increased steadily, compelling educators to transition to teach via a virtual space. Without prior experience, lack of training, and the pedagogical content intended for face-to-face learning, I entered the world of virtual teaching unprepared, which lasted nineteen months.

This study proposes to illuminate the experience of an educator working in higher education amid the COVID-19 pandemic to explore the reality of being new to teaching via a virtual space and the obstacle and opportunities encountered during this pedagogical transition. Moreover, the study aims to investigate how a sense of belonging develops within virtual spaces. This study uses an autoethnographic approach to fill the literature gap and gain a more insightful perspective to a personal account of virtual learning during the pandemic and the effect of such a transition on SoB, offering educators a perspective of personal involvement in virtual teaching.

Throughout my experience with online learning, I have found that educators may experience a SoB and promote SoB within students. Building self-esteem was a critical feature that developed through intrinsic motivation to learn and gain self-efficacy to teach within a virtual space that boosted my self-confidence, leading to a more profound commitment to my role and students. This study addressed an in-depth experience of virtual teaching, and although the challenges are evident, they are also overshadowed by the opportunities presented to become more than an educator. This study was the first autoethnography to focus on the first-hand experience of an educators SoB in virtual teaching during the pandemic; it can likely contribute to understanding enhancing SoB the nitch of technology-enhanced learning.

Keywords: Authoethnography, online space, COVID-19, virtual based-teaching, SoB, educator

TRinE - Telepresence Robots in Education

Andre Attard, Clifford De Raffaele, Edwin Zammit, Abduarahman Bazena
Applied Research And Innovation Centre

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 to actively control the robots and thus also to occupy 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.

The TRinE 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. Join us for an overview of the TRinE project, along with a demonstration of the in-house Telepresence Robot, showcasing its functionality to the audience.

Building Innovation Work Behavior- Curriculum

Robert Cassar
Outreach & Student's Affairs Department

The Erasmus + funded project entitled InTraRed yielded a considerable amount of research and a blended innovation management curriculum that recognises the time and human resources available within SMEs. In this light during the event, I wish to highlight IntRaRed's key deliverables.

Is Block-Based Programming an Effective Teaching Tool?

Oriana Ebejer
Institute of Information And Communication Technology

The pre-test of this study has identified the new factors which influence the students' performance in programming. In the full study, around 70 participants are taking part which is almost twice as much participants as in the pre-test. The questionnaire has been refined in different aspects. The questions have been rephrased, some of possible answers have been changed and the presentation is more comprehensible. The full study is also including the mark achieved in programming as one of the dependent variable. The new data set was collected via assisted interviews not as it was collected in the pre-tests through an online questionnaire. The data is again analysed using SPSS. A dimensionality reduction technique (Principal Component Analysis) and the Rotation Matrix will reduce the number of independent variables from 20. This exercise will be compared to the pre-test to check if the new identified factors will be similar to the pre-test. Almost all the participants approve of BBP as the ideal approach with Level 2 students, but they also suggest that a text-based programming language should be introduced as well during the year. Based on this research it is suggested to keep using BBP as a pedagogical tool but some participants suggest to change the specific tool which is currently used in class, which is Scratch. They suggest to use a tool which offers a translation of the visual steps to a text-based algorithm. Alternatively, complement the BBP tool with a text-based one. This study should help us understand better the students' perception of BBP tools.

Preventing Dropping Out in Post-Secondary Education (focusing on lower levels at ICS)

Marilyn Pace Mintoff
Institute of Community Services

Dropping out of school at post- secondary level is an issue which requires attention not only in Malta, but globally (Early School Leaving Unit, 2017; Writers, 2021). The research, which is in its second year of studies, focuses on students who attend levels 1-3 at the Institute of Community Services within MCAST.

During the first year of this research, data was gathered via questionnaires with the participation of both educators and students, as well through focus groups with students. Results obtained shed light on MCAST as a post-secondary institution when compared to secondary education and other post-secondary institutions. Data also showed insights on reasons as to why students choose to complete their studies and conversely why some students may decide to terminate their studies during the scholastic year.

The social role of post-secondary education, mentoring services and course relevance were amongst the factors shown to encourage students to complete their studies. Also, decreased travelling time to and from MCAST was also a positive influence for students to complete their studies during the past scholastic year. Conversely, financial instability, lack of financial support, bullying and few practical sessions/opportunities carried out during the past scholastic year may have lead students dropping out from the chosen course. Insufficient/Incomplete information given to students prior to application for specific courses may also influence dropping out. This is particularly related to certain courses which require students to buy tools/kits to work with which are beyond their financial means (including stipend allocation).

Along this second year of this research, a similar approach is adopted. Yet, new factors which are influencing students dropping out might be identified when comparing two scholastic years. The latter will be predominantly investigated in the light that different teaching/learning methods were/are adopted (online vs learning physically in class) along scholastic years 2020/2021 and 2021/2022 respectively.

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SESSION: 2

Long-term cooperation and training within the aquaculture sector

Kimberly Terribile
Institute of Applied Sciences

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. Their aim is to design professional profiles at EQF level 4 and level 5 as well as international units which may be followed by EQF level 4 and level 5 students. The project will also create six short-term courses for lifelong learning aimed at professionals in the aquaculture sector. 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. The project is now entering its final year and will be completed by December 2022.

Embracing an Inclusive Practice in the Early Childhood Cycle - Educators' Perspectives

Christine Schembri
Institute of Community Services

This research sets out to investigate the journey embarked by the Ministry for Education and several other local entities in publishing documents, laws, policies and frameworks relating to Inclusive Practice in Education. Throughout these last two decades, there was an enormous strive in Inclusion and Diversity issues as Malta had and still has several challenges relating to inclusion of several learners' diverse needs in our schools. The main focus of this study will be on the 'Policy on Inclusive Education in Schools Route to Quality' and 'National Inclusive Education Framework', both published in 2019.

As a data gathering instrument, a questionnaire will be constructed, having a blend of both closed and open-ended questions. It will be disseminated to three randomly chosen state primary schools from all ten Colleges in Malta and Gozo. The participants will form part of the Early Childhood Cycle namely the Head of School, Assistant Head of School in charge of the Early Years, a Year 1 and Year 2 teacher and two Kindergarten Educators representing Kinder 1 and Kinder 2.

A data analysis will be carried out to identify how our State Schools in the Early Childhood Cycle are embracing Inclusive Practices within a wider spectrum of several learners' diverse needs; how they are attaining these objectives; any barriers they might be encountering and recommendations put forward to achieve further goals.

DASARTS in Malta

Rochelle Gatt,
Institute of Creative Arts

Much of who we are is often evaluated by attributes of praise and blame, guilt and disapproval. In consequence, there has emerged in theory and practice a disposition to erect criticism into something, which is judgemental.

When discussing artworks outside of a safe environment the tendency is to personally interpret what we would have done instead of the artist himself. When a discussion is not moderated things tend to end up messy and unstructured. With free speech and severe criticism, the artist is likely to get insulted. Someone would just shout out something about the concept or an idea, another about the sound or the acting style and this triggers the maker to act defensively. Therefore, how can we achieve a situation where we freely discuss art works without insulting the people around us?

Feedback in art does not need to be related to the harshness of criticism. ''Feedback needs to be like a desire, something that you long for. The level of feedback should go beyond superficial judgement such as 'I like' or 'I don't like''. Van Lindt, B. (2013.) The scope of Dasarts is to postpone harsh criticism whilst allowing the feedbacker to enter somebody else's work in a graceful manner.

The proposed artistic research is to experiment with the creational process of a new physical theatre/ contemporary circus performance, which will premiere April 2022. This process will act as a case study to understand how the work is influenced;

- In A Maltese Context
- Via the feedback tool of Dasarts

For this research the intention is not about trying to recreate the experience of the performance, it is about asking the participants to observe and give insights on the content demonstrated during 3-4 different stages. During which, archiving and reflections are necessary for the generation of the creative process.

The Record Producer in Maltese Popular Music

Rene' Mamo
Institute of Creative Arts

The research presents the author's reflective process on his role as a record producer in Maltese popular music. This work is the outcome of his twenty-five-year career in sound engineering and record production, where he focuses on his self-produced albums and projects in the popular genre, in addition to his latest contribution to the music scene in Malta. Influenced by writers and producers such as Zak (2001), Gracyk (1996) and Howlett (2009), the study takes an auto-ethnographic approach through which, the author provides a portfolio of three tracks, produced with two Maltese artists and reflects on the experiences and challenges during the making of these records.

This research examines the cultural constraints and phenomena that are experienced during the making of popular music in Malta. It also explores how technology effects the Maltese musician's perception of a recording session.

Finally, the study analyses whether the practices reported in the case studies conform to the author's characterization of the classical record producer as a Surrogate Orchestra Conductor – a definition presented in the author's PhD thesis. These evaluations, together with other empirical inquiries aim to present the reader with a unique investigation area in Maltese popular music from a production perspective

Gender Equality Teaching in Early Years

Beverley Abela Gatt
Institute of Community Services

Education is critical to ensure that an individual reaches their full potential, has better employment possibilities, hence reducing social inequalities, marginalisation and poverty. The latter are factors that women are still facing, as indicated in figures published by The European Institute for Gender Equality (Equality, 2020). Even though several studies have addressed the topic of gender equality in early years education, and educators' interaction with students based on their gender, it is still a relatively new area of research in Malta. Researchers such as Dewar, Servos Basaki & Coplan (2013) highlight the importance of self-reflection for educators as a means to grow within one's profession and a tool to address gender stereotypes. This research engages with educators who teach early years pedagogy in the process of self-reflection so as to explore and address educators' gender stereotypes and how these might be passed on through the hidden curriculum. This process is being explored by first conducting an anonymous qualitative questionnaire to address possible stereotypes that the educators might have. I turn the results retrieved from the questionnaire will act as a basis for the interview guide, which will be used during a focus group held with the same educators to engage in reflective practice.

SESSION: 3

The impact of Enterprise Education on Students pursuing Professional Higher Education in Malta: A Grounded Theory Study

Ronald Aquilina, Alex Rizzo
Applied Research and Innovation Centre

This study examines the impact of enterprise education on students pursuing Professional Higher Education (PHE) at the Malta College of Arts, Science and Technology (MCAST). At EQF Levels 5,6 and 7, PHE is seen to include higher levels of work-related practice and stronger components of impact-based applied research. In particular, the study maps out the students' learning process by understanding their capabilities to generate ideas and to nurture their enterprise skills by recognising opportunities, by solving problems, by building relationships, and by strengthening self-confidence, prior to entering an enterprise venture. Relatively little is known on how students, pursuing enterprise education in a PHE context, are maximizing their potential in order to achieve a higher level of engagement in their enterprise activities within a dynamic business environment.

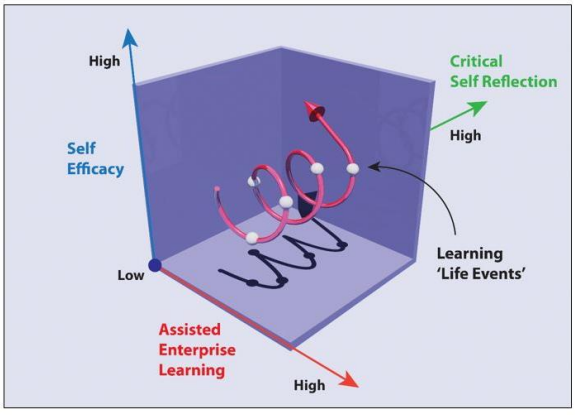


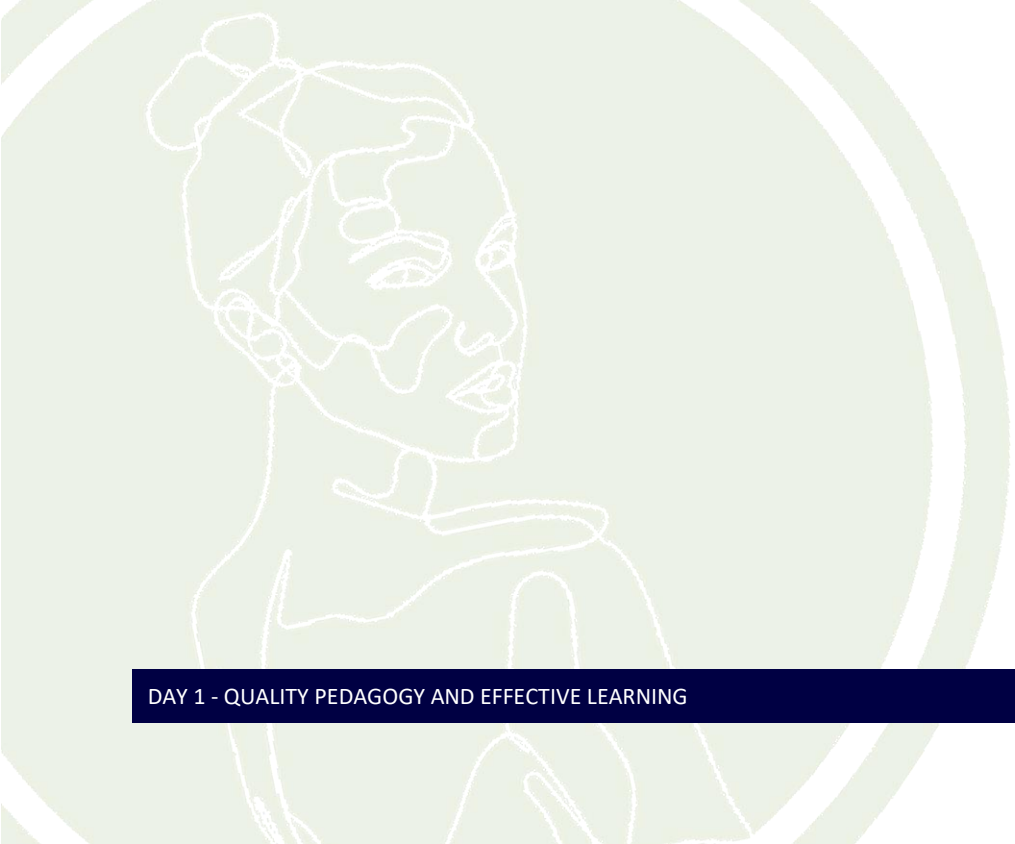
Figure 4: Grounded Theory Model for Enterprise Learning leading to Self-Efficacy

The research method applied is that of grounded theory as advocated by Corbin and Strauss's (2008, 2015) conditional matrix and Charmaz's (2006, 2014) constructivist approach. Interpretive and qualitative indepth interviews are undertaken with five participants, namely Master of Business Administration (for the Small Business) fresh graduates specialising in Enterprise Education at MCAST. The approach adopted in this study is in line with research developments in recent years, where grounded theory is being used as a methodology using the interpretative approach to undertake enterprise research (Urquhart 2013). It is expected that this initial study will be further extended until theoretical saturation is achieved. An early parsimonious model has been thus put forward that explains

how enterprise education influences PHE students' entrepreneurial behaviour prior to their engagement in any enterprise venture.

In this research study, findings indicate that the paradigm shift from a direct learning approach to an applied research component, where students directly interview entrepreneurs on topics relating to their taught modules, influences significantly the mindset of PHE students pursuing Enterprise Education.

This applied research study comprises several implications for the enhancement of delivering excellence in Enterprise Education by influencing the PHE students' skills and competences. It provides policymakers, academic researchers and other educational managers with a theoretical framework that can provide them with factors that may enhance the skills set of prospective entrepreneurs.

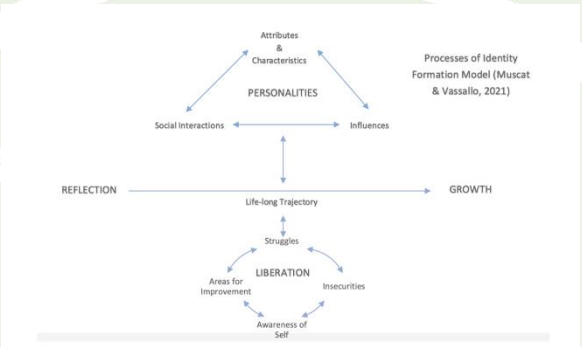


Factors Contributing to the Formation of Education Student Identities as Future Professionals

Nadia Maria Vassallo, Kenny Muscat
Institute of Community Services & Institute for the Creative Arts

A growing body of research in education shows that students' opportunities for academic identity development impacts their academic achievement (Vassallo, 2014). However, despite a recognition of the importance of identity development and the myriad of initiatives to enhance students' identity development and sense of belonging, students continue to fail to obtain an academic identity (Farrell, 1990), to the extent that many report a negative or insecure academic self-concept and identity.

In the current and future scenario, where the demand for students to be optimally prepared when entering increasingly complex professional workplaces, this is highly unfortunate and is shortchanging students in their preparedness. Indeed, Jensen and Jetten (2016) indicate that students feel the need to develop a professional identity to appreciate and understand the relevance of their studies, and the inability to develop it leads to uncertainty, stress, and perceived poor academic achievement.



Professional identity is comprised of two distinct professional paradigms: social and psychological. The socialization process is characterized by doing, while the psychological professional is characterized by being. Hence attitudes, behaviours and ethics are as necessary as knowledge, skills and competences. One without the other presents an incomplete conception of professional identity (McCammon & Brody, 2012; Crigger & Godfrey, 2011).

This presentation, focuses on the findings following the first stage of a three-year research study, looking into the students' positionalities and perspectives of

current and future self as they embark on a three-year VET initial teacher training degree.

Analysis of data revealed that personalities and life-long trajectories impact students' perceptions and positionalities, both at a personal and professional level, and these may limit or enhance growth. Engaging into reflexive practices enhances awareness leading to liberation and further growth.

Improving Geriatric Patient Satisfaction: Development of a High-Fidelity E-learning Simulation Course to Develop Intercultural Skills in Geriatric Patient Care - GNurseSim

Neville Schembri
Institute of Applied Sciences

Globally, the number of people over the age of 60 is expected to more than double by 2050. Diseases associated with ageing, such as dementia, are identified by the World Health Organization as being a major global health challenge that current and future healthcare providers must be prepared to meet. Due to the current culture mix, globalization and the degree of mobility in the world of work, it is likely that the elderly patients will be cared for by a geriatric nurse that does not share the same values, traditions and cultural background as the patient.

The current epidemic situation makes every Higher Education Institution (HEI) acutely aware of the need to create blended/distance learning courses. It is vital that these are created in a way that optimizes learning and ensures the students' further development of their skills and competences in the future. Simulation is a safe way to train healthcare providers to provide effective care for older people and their families and there is evidence that simulation-training can improve the quality of care provided for older people. Although geriatric simulation programmes are being undertaken worldwide, hardly any touches on the issue of intercultural differences as a problem that professional geriatric nurses should be well conscious of.

In this context, the objectives of GNurseSIM are to support HEI to provide students in geriatric nursing with opportunities during their training to practise skills of adopting a multidisciplinary holistic approach to the care of older patients. This will be achieved by combining elements from different approaches to arrive at a unified model and develop an intercultural, culture-sensitive geriatric nursing course, as well as recommendations and guidelines regarding the implementation of the course and possibilities it offers to other areas of nursing. The project is funded under Erasmus + KA2 - Cooperation for innovation and the exchange of good practices.

Environmental and Cultural Sustainability

Research within the environmental domain is vital for a sustainable future and is highly relevant for a broad spectrum of stakeholders, including society. Extensive research has been conducted at MCAST within this area, and has contributed, but is not limited to, nature-based solutions, biodiversity, research for a better understanding of certain aspects of the ecosystems, animal husbandry, fisheries and other food production areas. This thematic area also covers research on the identification of a number of polymers and surfaces with photocatalytic potential, as well as areas such as water efficiency, water quality, water meter research and apparent water losses, and water treatment. Research endeavours under this thematic area has seen collaboration with multiple stakeholders, both on a national and international level, with some of the research being supported through external funding including H2020.

One of the main United Nations Sustainability Development Goals addresses sustainability at large, and one of the most essential components is sustainability of cultural heritage. Research is currently being carried out in the creative arts institute at MCAST, which addresses such cultural heritage issues along with scientific studies in restoration that support research in the aesthetic value of Maltese artefacts. Current research focuses on restoration of Maltese balconies, research on Maltese embroidery, and the history of theatrical hubs in Maltese religious institutions.

ENVIRONMENTAL AND CULTURAL SUSTAINABILITY

SESSION: 1

Are dolphins on the increase? Integrating Scientific and Local Ecological Knowledge

Kimberly Terribile
Institute of Applied Sciences

The use of the local ecological knowledge (LEK) of fishers is being applied to understand the interaction occurrence between small-scale fisheries and cetaceans in the Mediterranean regions with the aim to conserve the cetacean populations, while at the same time ensuring sustainable fisheries. Locally, during the first phase of this project, interviews with small-scale fishers were conducted using a pre-defined questionnaire. These investigated interaction characteristics, and found that in coastal regions, including the Maltese Islands, such cetacean depredation often involved the bottlenose dolphin Tursiops truncatus. When asked about the situation over the past 5 years, 76% of the surveyed fishers agreed that the interaction increased over the past 5 years. The average reduction in catch sustained by fishers from one encounter is 59.22% suggesting that dolphin depredation does result in catch losses, a reality mostly experienced by those using trammel nets.

The research has now entered its second phase during which onboard observers are joining fishers on a regular basis in order to determine the frequency, type and location of the dolphin interactions. Successively, an innovative technology of pingers will be tested with the aim of reducing the damaging depredation interactions on fishing activities. The factors that are leading to an increase in the incidence of depredation by dolphins and other vulnerable marine species in recent years will be examined in depth, as well as the changes in the incidence of interaction cases after the use of new mitigation systems. Such an integration of LEK and scientific data of the current status of dolphin depredation and its effects on small-scale fisheries in the Maltese Islands 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.

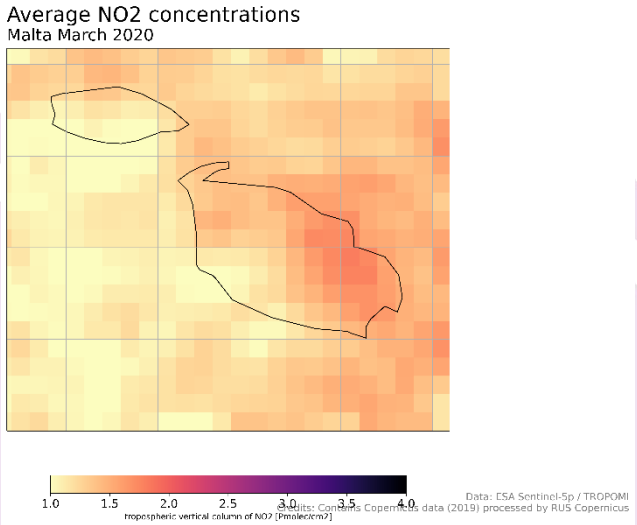
This research forms part of a multiregional pilot research project supported by the MAVA Foundation which was initiated by LIFE in 2019. The organizations involved in the project are the Malta College of Arts, Science and Technology (MCAST), the Asociación Herpetológica Española, and the Italian Associations Mare-Camp and eConscience.

Continuous Assessment of Pollutants and Environmental events via Satellite data (CAPES)

Frankie Inguanez, Daren Scerri, Juan Jose' Bonello
Institute of Information And Communication Technology

The monitoring of pollutants and events of an environmental and climate change nature form part of European and local legislation aimed at providing humans with a safe and healthy environment. To aid in this process the European Space Agency provide a suit of satellite programmes, namely the Meteorological Programme, the Copernicus Programme and the Earth Observation Envelope Programme. In this project we have started a number of local initiatives to aid local partners in use of said programmes to improve their goals.

Our first initiative is to support partners and resident researchers in the undertaking of research within the area of air quality due to pollutants (CO, CH4, H2O, HCHO, NO2, O3, SO2) more specifically: monitoring of pollutants due to sea traffic within the Maltese harbours; sea vessel emissions monitoring at the bunkering areas; air quality fluctuations during the 2020 and 2021 (partial) lockdowns and other similar periods; provide a Tropospheric column data stream to compliment the land assessment monitor stations currently adopted by the Environment & Resource Authority.



With the Environment and Resource Authority we have collaborated on a number of initiatives, currently working to develop and deliver a number of training session on the use of satellite data and how this can aid in their mission statement. With the Malta Resource Authority, we are collaborating on mapping out the land use and land cover of the Maltese islands over the past few years. Both entities report to the Ministry of Environment and Climate Change Planning.

To train our students and young researchers with have started an annual hackathon event in remote sensing focusing on researching environmental events of local and regional importance. A number of students have undertaken this challenge who are pursuing this research further for their final year dissertation. Research topics undertaken by our students include assessment of shoreline erosion and assessment of lockdown events on local air quality.

Maltese wooden balconies: a technical and scientific study.

Michael Formosa
Institute of Creative Arts

Following the specialization in science and conservation of wood and furniture, further research will be dedicated specifically to local wooden balconies. The research will increase the understanding on local balconies, which will be essential to address sustainability of cultural heritage. It will also add to the author's expertise in the area, which will then translate to a higher pedagogical value at MCAST.

Due to our harsh climate, i.e., wet, cold and humid winters and dry, hot summers, ongoing degradation of external woodworks is a reality and their conservation poses endless challenges. Research is being carried out on three balconies having historical value. One of the balconies also has artistic values. This study focuses on three different aspects which will be delivered in two phases between 2020 and 2023. One of the aims is publishing a paper in an academic journal at the end of the study.

The research will be focused on the following:

Technical and scientific study

Photographic and graphic documentation supported by illustrations of various joints used for such constructions.

- Scientific investigations to identify constituent materials, basically wood and surface applications. Additionally, microscopy will be carried out to assess any biological degradation. Environmental monitoring of at least one location will be carried out for a period of twelve months.

Conservation of local apertures

- Analysis of data collected from the first year of research.

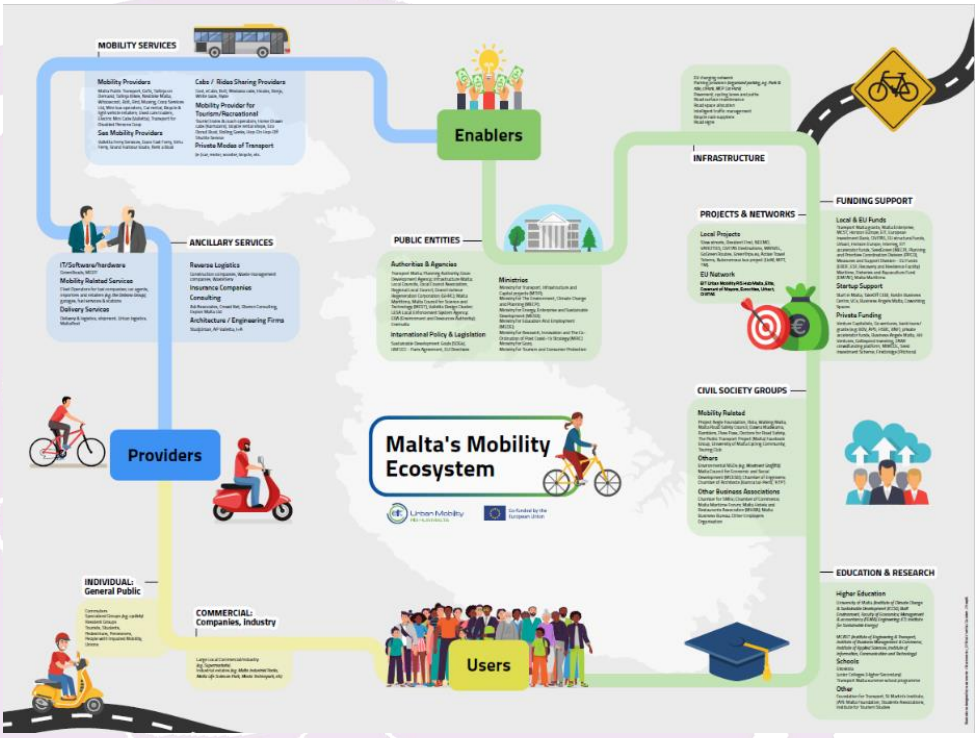
- Identifying common biological, physical, mechanical and chemical degradation.
- Proposing methods of stopping chemical and biological degradation.
- Evaluating conservation and ethical values to propose the best solution to save apertures by preferably retaining as much as original material as possible.
- Carrying out a seminar to local agencies such as Restoration directorate, Heritage Malta and also any other private sector who are involved in the conservation of local apertures.

Promotion on the local media, presentations and discussions will be incorporated in this study.

The EIT Urban Mobility Hub: Promoting a transition in transport in Malta

Suzanne Maas
Applied Research And Innovation Centre

The EIT Urban Mobility Malta RIS Hub aims to promote sustainable mobility in Malta, and is led locally by Project Aegle Foundation, the Malta College of Arts, Science and Technology (MCAST) and the Valletta Design Cluster (part of the Valletta Cultural Agency). The Hub is supported by EIT Urban Mobility, an initiative of the European Institute of Innovation and Technology (EIT), a body of the European Union. In this presentation, a representative of the Hub will take the audience on a journey through activities and events organised by the EIT Urban Mobility Hub Malta since its inception in 2020, guided by the newly created 'Malta Mobility Ecosystem' Map. In this infographic, Malta's movers and shakers in the mobility sector are all mapped out, classified in groups: Providers, Enablers, and of course, Users.



SESSION: 2

The use of mycorrhizae and biodegradable mulch in Maltese agriculture.

John Galea
Institute of Applied Sciences

During this academic year, I will be carrying out research on two separate field experiments:

a). The use of biodegradable mulch in Maltese agriculture: a feasibility study

A field experiment will be carried out to evaluate differences, both from an agronomic and economic point of view on the use of biodegradable mulch (BDM) in Maltese agriculture. Polyethylene mulch (PE) is widely used in local agriculture for the production of crops such as tomato for processing, aubergines, peppers and strawberries to suppress weed growth and maintain soil water from evaporation. PE mulch is only used for one crop where afterwards it is pulled out and disposed of in the landfill as this plastic is dirty with soil. The use of BDM can eliminate completely waste production from the use of mulch.

b. Mycorrhizae: their influence on crop performance in Maltese soil

Research shows that mycorrhizal fungi alleviate the plant during drought conditions. with the effects that climate change can have on Malta, crop production especially in summer will be a challenge on water resources due to prolonged dry spells. Mycorrhizae help plants during stressful conditions of drought such as improving root efficiency and size and regulating transpiration. Using mycorrhizae can be one of the strategies used to improve our crop production during drought conditions. A field experiment will be carried out comparing the use of PE and BDM mulch for both agronomic and economic aspects.

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

Christine Zerafa, Christine Vella, Moritz Zavan Stoeckle
Institute of Creative Arts

The word "gig," now commonly applied to any informal form of paid work (as in "gig economy") 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 in all Member States. 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 will work 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 currently developing a bespoke training curriculum that will have specific modules tailored to the needs of 3 distinct groups, namely; Musicians; Dancers; 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.

Assessing climate and environmental risks for the Mediterranean terrestrial ecosystems

Mario Victor Balzan
Institute of Applied Sciences

This presentation provides an overview of a recent assessment of the climate and environmental risks for the Mediterranean basin ecosystems, and identifies next steps associated with the systematic analysis on biodiversity of these risks at regional scale. Biodiversity changes in the Mediterranean over the past 40 years have occurred more quickly and been more significant than in other regions of the world.

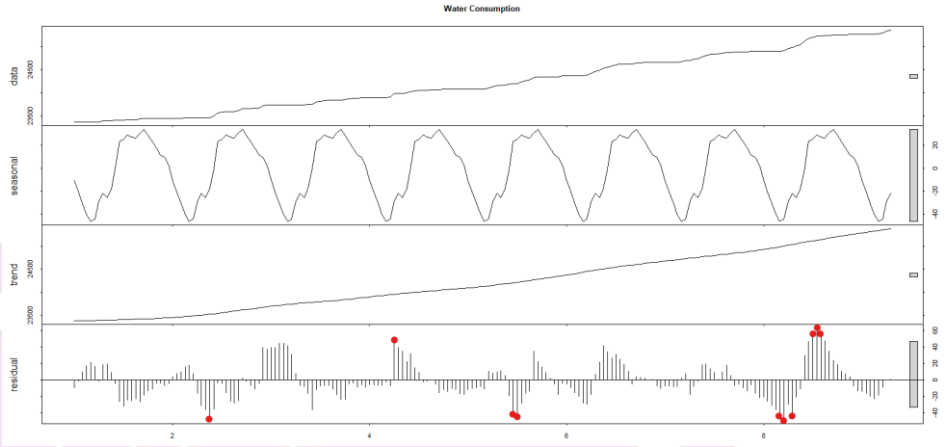
Agricultural abandonment has led to a general increase in forest areas in the northern Mediterranean, while in the southern Mediterranean, ecosystems are at risk of fragmentation or disappearance due to human pressure from clearing and cultivation, overexploitation of firewood and overgrazing. Drylands have significant biodiversity value, with many of the plants and animals highly adapted to water-limited conditions and are undergoing an overall increase in response to climate change and extensive land abandonment. Contrastingly, 48% of Mediterranean wetlands were lost between 1970 and 2013, with 36% of wetland-dependent animals in the Mediterranean threatened with extinction. The reduction of river flows is an important threat for freshwater biodiversity, and 40% of fish species in Mediterranean rivers are endangered.

Future projections indicate that burnt areas can increase across the region by up to 40% in a 1.5°C warming scenario and up to 100% from current levels for 3°C warming at the end of the century. Mediterranean drylands will become drier, and their extent is expected to increase across the region. Projections suggest decreased hydrological connectivity, increased concentration of pollutants during droughts, changes in biological communities as a result of harsher environmental conditions, and a decrease in biological processes such as nutrient uptake, primary production, and decomposition.

Pre-processing Water Consumption Data

Andrew Cortis, Alex Rizzo, Christian Camilleri, Stephan Riolo
Institute of Information And Communication Technology

Metering water consumption is a complex problem. Apparent losses in water consumption are a major cost to water supply companies that are caused by water leaks, theft and even water meter inaccuracies. Water meters can become very inaccurate over their lifetime and under read the actual consumption of a household. The age of the water meter, as well as water consumption patterns can affect how inaccurate the readings can become. These phenomena make data pre-processing a very important step to understand water meter consumption.



Water meter readings are often described as a timeseries. Actual water consumption has different seasonality patterns: daily; weekly; and even yearly. Individual consumers can also have a trend, such an increase in water consumption, as well an amount of randomness, or noise, in the amount consumed. The time series can be decomposed into these components.

Further data pre-processing includes outlier detection and data engineering which are useful for a variety of statistical methods. Outlier detection, for example, can look at the noise component of the decomposed timeseries to detect points with exceptionally large noise. Additionally, data pre-processing can also benefit from creation of new data attributes from existing data. An example of data pre-processing will be demonstrated using R.

The Development of Pandemic Art : 1300-1900

Clint Calleja
Institute of Creative Arts

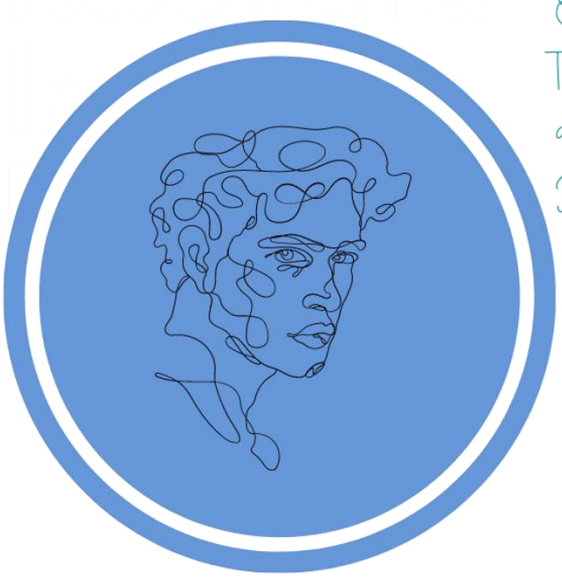
The presentation will focus on the development of pandemic art and iconography between the fourteenth century, when Europe's population and social structures began to be devastated by the effects of the 'Black Death', up until the nineteenth century, when the advancements in medicinal research and other sciences gave a better understanding of what and why pandemics emerged.

The overwhelming strength by which pandemics, especially the bubonic plague, penetrated cities across Europe in the period discussed, had a significant influence on art iconography. Unfortunately, plague iconography is a subject that has been almost ignored by art critics and historians, thus only a few books were dedicated to the subject. Through these works, which mostly fall under the painting category, one can better comprehend aspects of the daily social life of European cities during a pandemic outbreak. As a result of this research, the control religious authorities had in dictating their theories on pandemics became very evident. Most of the early pandemic iconography was directly inspired by what the church authorities theorised about the disease. Most of the early iconographic elements created, as for example the plague angels and the arrows, were inspired from passages from the holy scripture or other religious books. The influence of the Church on pandemic art production will continue for almost half a century when it will eventually start to loose it strength with the emergence of new enlightened theories.

Research & Innovation EXPO 21

ABSTRACTS: DAY 2

Tuesday 21st



Emerging Technology and Creative Innovation

The ‘Emerging Technology and Creative Innovation’ research theme encompasses projects from various institutes, with the main objective addressing research and innovation in technology and the creative arts. Applied Research projects which are currently taking place at MCAST focuses on the Artificial Intelligence, Robotics, 3D Printing, Distributed Ledger Technologies, Cyber Security to Games Research and span from the development of augmented reality platforms, to the development of wearable sensor technology, while also hosting creative projects leading to the development of new methodologies in the performing arts, photography and graphic language. Innovative research in the creative arts finds its focus in practice-based research, whereby MCAST researchers use their artistic practice to develop innovative methods that contribute to enriching artistic detail, enhancing audience experience, while also leading to new methodologies that expand the repertoire of international artistic practices.

EMERGING TECHNOLOGY AND CREATIVE INNOVATION

SESSION: 1

Robotics and AI courses in the classroom

Thomas Gatt
Institute of Information And Communication Technology

MCAST, together with a number of vocational schools in Europe, is currently developing a number of courses related to Artificial Intelligence (AI) where the main goal is to develop AI skills of ICT teachers and pupils in the vocational education and training (VET) sector. The project, titled 'Introducing Artificial Intelligence to Vocational Schools in Europe' (No. 2020-1-LT01-KA202-078015) and co-funded by the European Commission under Erasmus+ KA2 program, aims to conduct research on AI, develop lesson materials and disseminate the project's intellectual output across VET and other educational sectors in and outside of partner countries. In this presentation, an overview of the course being developed by MCAST titled 'Robotic Arm and Computer Vision' will be given. Students are introduced to topics such as Machine Learning, Reinforcement Learning and Deep Learning through practical examples and coding. The robotic arm is then introduced and combined with a trained computer vision AI model, the arm is trained to sort small blocks based on their colour. Throughout this course, students are introduced to all stages of AI model building: data collection, cleaning, augmentation, training and testing. This project is currently being tested in 3 vocational schools in Europe (Malta, Germany and Lithuania) and results are expected to be compiled in mid-2022.

The Hydrodynamics of Multiphase Swirl-Induced Flows

Darren Mifsud
Institute of Engineering and Transport

Most of the industrial equipment designed to handle single or multiphase fluids have geometric features that attribute unique flow dynamic characteristics. Industrial process facilities involve networks of pipelines characterised by several devices and pipe fittings of various geometrical configurations. Typical components include elbows, valves, annular pipe sections, pipe reducers such as nozzles and orifice plates, expanders such as diffusers, and other complex pipe sections such as helical and spiral pipes. Such fittings and devices are primarily installed for various purposes, such as to give flexibility to the system, to condition processing fluids or to enact control. Several authors have in the past understood that studying the fluid behaviour across a specific geometric configuration was an opportunity to develop simple methods in aid to estimate total mass flow-rates, and facilitate other processes, such as phase separation and zonal mixing. Beyond that already done, the current research within the Engineering Fluid Mechanics Research Group (EFMRG) focuses on an advanced method based on the concept of swirl-induced flow within multiple-orifice injection body which allows for earlier jet-breakups, thus sustaining homogenous liquid-gas mixtures, and thereby eliminate drastic intermittent jet behaviour. A promising flow conditioning method in ejector pump technology for flow meeting purposes.

Virtual Reality Learning environment for Schizophrenia

Mark Spiteri
Institute of Information And Communication Technology

The World Health Organisation (WHO) reports that over 20 million people suffer from schizophrenia world wide. Malta contributes too its fair portion with over 11, 200 diagnosed cases by the year 2017; which accounts for over 2.3% of the currents Maltese population (Ministry for Health, 2020). Furthermore, more than 69% of people with schizophrenia are not receiving appropriate care. In addition, 90% of people with untreated schizophrenia live in low- and middle- income countries. Whilst Schizophrenia is successfully treatable, treatment with medicines and psychosocial support is effective and suggested by the WHO. However, most people with chronic schizophrenia lack access to the right treatment (WHO, 2020).

Persons suffering from a mental illness have two main types of struggles. Not only they have to cope with their symptoms but also society disapproves/misunderstand their behavior and consequently gets them stigmatized. Such stigma leads to discrimination even though a person copes well with their mental illness (Rüsch, N, 2005).

Over the past 50 years, healthcare knowledge more than doubled, improving practices and treatments. This rapid change demands innovative ways in educating and train new procedures to professionals and students. Learning technology can aid with such rapid changes such as VR (Virtual Reality). VR has long been proven to be used as an educational tool also in the mental health sector. A VR learning experience is able to pass on knowledge through a virtual 3D environment where users can experience situations and treatment procedures through: sound, video and interactive features. A VR experience immerses the user making it interesting and fun to learn (Mantovani, F,2003).

Aims:

- Using innovative learning technology for the understanding of schizophrenia targeting mainly the health and ICT sector.
- Create an educational tool for healthcare professionals and students to further understand schizophrenia.
- Educate the general public with regards to schizophrenia to improve social inclusion.

Erasmus+ ECOdesign4EU: Training Contents and Joint VET Qualifications on Ecodesign for Creative and Cultural Industries

Owen Sacco
Institute of Information And Communication Technology

ECOdesign4EU is an Erasmus+ project that addresses the common challenges of supporting the transition to a Circular Economy in Cultural and Creative Industries by applying Ecodesign principles to these sectors through innovative VET methods and tools. The project addresses the following objectives:

- To design a new European ECVET Curriculum of reference on Ecodesign for sustainable CCIs.

- To promote innovative WBL methods and pedagogies addressed to I-VET and C-VET students, TARGET BENEFICIARIES of the project, in order to acquire and apply Ecodesign to CCIs.

- To provide digital solutions, the ECOdesign4EU Virtual CAMPUS, for the capacity building of VET and in-company teachers and trainers, managers and course designers, TARGET USERS of the project products, with innovative WBL teaching methods to acquire and apply Ecodesign principles in CCIs

- To co-design, adapt and test a practical and innovative Mobile Assessment App designed to evaluate competences on Ecodesign for CCIs included in the European ECVET Curriculum of reference.

- To support the exploitation strategy of the project and the mainstreaming of the project results with a Guideline to foster transparency and recognition of Ecodesign for sustainable CCIs.

During this presentation, we will present an overview of the project and the results achieved so far.

The Impact of the Developments of Printing on the Decoration of Books of Hours as Illustrated in Examples found in Collections in Malta

Martina Caruana
Institute of Creative Arts (Director)

The mid fifteenth century saw significant technological developments in the printing industry in Europe. Gutenberg's revolutionary contribution to printing through the use of moveable type impacted the book trade considerably and caused a shift in manufacturing techniques and aesthetics. Through this presentation, the impact of such developments will be discussed with particular reference to the book of hours, citing examples from collections in Malta. Specific reference will be made to illuminated and decorated books of hours from the National Library in Valletta, together with an example from the Wignacourt Collegiate Museum in Rabat. While providing a contextual background to the popular late medieval book of hours and its manufacture in manuscript form and with hand painted illumination, together with outlining Gutenberg's contribution to developments in printing, this presentation accounts for the way the manufacture of books of hours changed around the turn of the sixteenth century. It discusses aspects of continuity while noting the significant changes promoted by such a landmark technological innovation. While doing so it accounts for the adaptations/innovations that contemporary artists

made to the visual arts in response to such changes. Furthermore, it highlights the resultant democratization of both the text and the associated image for the benefit of an increasingly literate society.

SESSION: 2

Bus ID System Aiding Visually Impaired Persons

Joseph Attard
Institute of Engineering and Transport

The aim of this research is to create a system, that will help visually impaired persons, and elderly people, use the public transport with minimal to no assistance. This, gives these persons, more freedom. The system will be able to announce, the arrival of a route-bus, allowing enough time for these persons to get ready, for when the bus arrives on the stage or bus stop. The system consists of a transmitter located at the Malta Public Transport offices and receivers on multiple stages or bus-stops. The communication is via 4G mobile network. The same communication protocol used by the "Tal-Linja" app shall be used by the proposed system making it easier to integrate with the existing communication infrastructure already in use by Malta Public Transport.

The Electric Vehicle Scenario

Malcolm Caligari Conti
Institute of Engineering and Transport

The purchasing of an electric vehicle often requires the optimisation of a number of parameters. These parameters as well as their results have been analysed and given results as to the top contender for the selection of an electric vehicle to be purchased by MCAST. The research then poses the question of how these parameters vary with price to find some very interesting results. The design of a new workshop for the service of these electric vehicles which allows the training of several students at IVET and CVET level is also considered, and several technological and safety considerations are made. An introduction to research as to the uptake of electric vehicle servicing withing the context of CVET and IVET and how quality control and accreditation may lend itself to the introduction of vocational training on electric vehicle servicing and overhaul in third party educational institutions such as MCAST. The question posed must change from one where the status quo is assumed to one where the quality of education in this sector is questioned, with the aim of pushing the VET provider to provide a higher educational experience which not only trains the students for industry but rather provides a more holistic perspective as to the industrial and social requirements and how these may be met.

Applied Research in Electric Vehicles (EV)

Andy Bugeja
Institute of Engineering and Transport

The main idea is to prepare and implement the proper infrastructure and course material so that the student who is the central recipient of this research can profit from MCAST's courses and ultimately be better prepared to contribute to the highly emerging Electric Vehicle (EV) E-mobility (EM) sector.

This applied research will explore methods to convert a used electric car into an EV didactic jig intended to facilitate learning by students, and at the same time, they can have hands-on experience during their studies.

My research started with evaluating the components of the used Electric vehicle (EV) (REVA). The next stage is to restore the parts that are needed for the EV jig.

Who Will Benefit:

The EV Didactic Jig (EVDJ) shall enhance students' learning experience and help them better understand the principle of operation of EVs. Lecturers may use the EV didactic modules to demonstrate the experimental process in an EV system and explain theoretical principles during their lectures. The EVDJ will ease the demonstration of the maintenance, troubleshooting faults, and effectively doing repairs on an actual EV.

The jig shall have a clear vision of the components within the EV and, at the same time, optimize space. Therefore, panels and features that are not relevant to the operation of the EV will be removed, and the jig will include the required operator's controls, a charging unit, a battery and an electric motor with the controller. Options will be explored on how to demonstrate to students the energy recovery system in an EV.

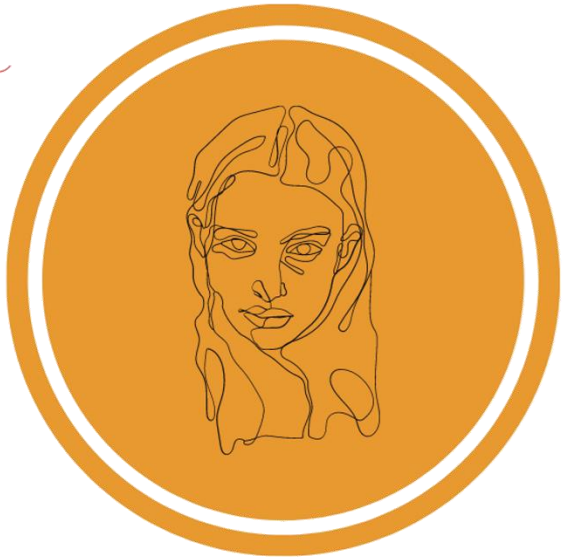
IoT and Drones for Agriculture

Steve Zerafa
Institute of Engineering and Transport

In the Mediterranean region major food chain industries, starting from manufacturing companies and going down to farmers are facing serious numerous threats, including water scarcity because of climate change, lack of rainfall, changing patterns of the traditional weather seasons, more crop diseases, longer summers days and extra heat stress. Moreover, there is a huge lack of interest from the younger generations to work in the farming sector. With less people entering the farming profession, most farms are facing the challenge of a workforce shortage. Traditionally farms have needed many workers, mostly seasonal, to harvest crops and keep farms productive. However, as we have moved away from being an agrarian society with large quantities of people living and working in farms, now large quantities of people are living in urban areas, and moreover less people are able and willing to tend to the land. One solution to help with this shortage of workers is AI agriculture tools. The National Statistics Office in Malta shows that the number of young full-time farmers is relatively small. Only 7% of farmers are aged under 30

The Crop Intelligent Tools project aims to create innovative AI tools to assist farmers and improve their efficiency by the se of technology by; (i) using less water and fertilisation substances during irrigation due to higher precision of the amount of water actually needed, (ii) generate more yield, (iii) create scientific measurements for a long manual measurement tradition, (iv) semi automate various manual tasks within the industry, and (v) digitally monitor climate change and effects on agriculture.

Social well-being, Sports and Health



Social well-being, sports and health research are interlinked research areas of focus at MCAST. Research in this field is highly valuable not only for the academic audience and other researchers but also to society at large. The Health and Social Care Department look at the sociological aspect. Within this sphere research is currently being undertaken in collaboration with various entities working in the community, including a parish community and the Standards of Care. Another project is putting focus on mental health.

Research under the health sphere at MCAST is rapidly expanding, and is contributing but is not limited to, areas of public health interventions, investigation of aspects of health practices which could lead to recommendations in change in policies, and exploration of the concept of nursing outreach in Malta. Health research is not only limited to the healthcare professional arena, but is also being extended to the educational realm, especially in the area of transcultural nursing research and education. Research activities under this thematic area has seen collaboration with both national and international partners and a number of submissions for external funding.

At MCAST we are also focusing on Sports Research with a special focus on the relation with the Health aspects. In this sphere there is an active collaboration with the Malta Football Association and the Special Olympics Committee amongst others. Researchers are also involved in a European cooperation project which looks at how physical activity can be a means to improve health.

SOCIAL WELL-BEING, SPORTS AND HEALTH

SESSION: 1

Queering Francis of Assisi

Tyrone Grima
Institute of Creative Arts

Francis of Assisi is one of the most popular religious figures in history, esteemed by believers and non-beliers. Often associated with his love for nature and ecological values, Francis was also a person who challenged the infrastructure of the society that he lived in and can be considered to be one of the queerest saints in Christianity. His defiance of the power structures and dynamics of the feudal system can classify Francis as a queer person who challenged the 'norms'. The starting point of this project will be the application of queer theory to the seminal biography written by Tomasso de Celano on Francis of Assisi. This study will particularly focus on the queering of the body, with a specific emphasis on the narratives in the Celano biography that depict the encounter with the leper and the receiving of the stigmata. Although this will be juxtaposed against the medieval frame of mind and the medieval social constructs, the findings will be embedded within a theoretical framework that reflects a contemporary perspective, specifically the work by Judith Butler. The findings will be 'translated' in an original theatrical script that will depict the life of the saint, as seen from a queer angle. A small performance, based on part of the script, will be performed and analysed.

Investigating Modifiable Health Behaviours in MCAST Students

Johann Zarb
Institute of Community Services

Health related behaviours have the ability to shape health on an individual as well as on a population level (Short and Mollborn, 2016). The study was undertook in order to better inform the status quo in regard these behaviours within the Malta College of Arts Science and Technology (MCAST), the leading vocational education and training institution on the island. An online questionnaire was disseminated among MCAST students aged 16+ and a sample of n=483 responses was collected. Information on physical activity and sedentary behaviour, substance abuse, self-reported health and happiness at school was collected. A significantly high proportion of students (23.4%) ($\chi^2=90.96, p<0.01$) who are not active for at least one hour (in the previous 7 days) was noted. This is of note considering a statistically significant ($\chi^2=57.24$, $p<0.01$) weak association between physical activity in previous seven days and perceived state of health. Juxtaposing the low levels of physical activity are the high levels of sedentary behaviour, specifically sedentary screen time. In this case a statistically significant ($F=6.78, P<0.01$) relationship between screen time and life rating and happiness at school ($\chi^2=25.51, p<0.01$) was observed. Low levels of alcohol and tobacco consumption were observed, while higher levels of cannabis use were identified when compared to similar studies carried out in Malta. The majority of students (67%) reported being happy at school during the period the survey was administered, and statistically significant high percentage of students ($\chi^2=308.66, p<0.01$), namely more than half (95% CI 51.6% - 60.6%), reported feeling a lot of pressure from the schoolwork with females reporting higher levels of pressure when compared to their male counterparts. The majority of the students also reported that they are in good or excellent health, with males reporting better health then their female counterparts.

Promoting Physical Activity and Sport Participation with Individuals with Intellectual Disability (ID) in an Inclusive Setting.

Amanda Dimech
Institute of Community Services

While the importance of inclusive Physical Education (IPE) has been widely acknowledged (UNESCO, 2015A; Lieberman et al. 2019; Morrison and Gleddie, 2019), research continues to identify the challenges in integrating students with intellectual disability (ID) into mainstream PE lessons (Ammah and Hodge, 2005; Qi, Lijuana and Ha, 2016). Research concludes that students with ID continue to feel isolated, (Lieberman and Block, 2016) primarily because activities have not been adapted to meet their specific motor skills and cognitive needs (Hodge et al. 2004). Moreover, such setting creates higher risks of social problems such as bullying and isolation (Rose and Gage, 2017).

Thus, in order to provide students with and without Intellectual Disability with Quality Physical Education (QPE), PE teachers should be equipped with the right understanding, skills and expertise to prepare and conduct "learning opportunities" in a positive inclusive setting (Vickerman and Maher, 2019, p.53). For this reason, I will be conducting an integrative review due to the limited knowledge and understanding of the PE teachers and LSEs perspective. Moreover, I will be investigating the barriers and facilitators students with intellectual disability face when trying to participate in physical activity and/or sports in or outside the school environment (through semi-structured interviews).

Educator's Experiences of Managing Workplace Stress and Burnout in a Post-Secondary Vocational Institution

Luke Mallia Azzopardi
Institute of Community Services

The research title pertaining to this study is "Educator's Experiences of Managing Workplace Stress and Burnout in a Post-Secondary Vocational Institution". The research questions driving this study are "what stressors do you encounter at your place of work" and "what coping mechanisms do you use to mitigate workplace stress". The methodology which was deemed most suitable to conduct this study is Interpretative Phenomenological Analysis (IPA) (Smith, 1990). A cornerstone of IPA is the search for participants 'lived experience' and consequently bringing the 'essence of their experience' to light (Smith, Flowers & Larkin, 2009). A total of five lecturers from three different institutes were recruited purposively yet voluntarily, to sit for one individual, in depth semi-structured interview. The data collected from the interviews were transcribed verbatim and analysed using thematic analysis. The two superordinate themes of 'Stressors' and 'Coping mechanisms', together with their respective subthemes, were chosen as best able to represent the participants' experience.

Key words: Workplace stressors, Burnout, Coping mechanisms, Resilience, Mental health, Wellbeing, Interpretative phenomenological research.

Exploring new pathways of gainful employment for Persons with Intellectual disabilities within the Tourism sector in Malta: Promoting cultural tourism and ethical dining for locals and tourists. A Feasibility study.

David Callaby Floridia
Learning Support Unit

The future lives of Persons with disabilities require to be secured, and one of the ways to do this is to provide pathways for future employment and for independent living. Culinary skills, like other skills, offer a twofold advantage. On the one hand they offer a set of skills to be used for independent living, while on the other, the same or similar skills set could be used for gainful employment. This project will begin to highlight the feasibility and desire for there to exist a place where customers and servers who are persons with intellectual disabilities (PwDs) coexist in a healthy business-oriented environment.

The study sets out to conduct research using secondary sources that will later inform the basis for primary research to be conducted. For the primary research it is intended to conduct surveys with the public, to inform the study about customer preferences where it comes to an eatery staffed by PwDs. A market analysis will also be conducted via the use of secondary data, and/or on-site observations of the targeted area. Other required data will be collected via contacting various food products and equipment companies/associations that could guide my research about various pricing.

As with all feasibility studies the focus will be on whether the project for this type of operation, and in the chosen venue will be feasible for operations. The type of business model for this enterprise will be indicated, while the start-up costs for launching the project will be included in the study. Meetings will be held with stakeholders whose input will contribute to maximizing the resources found in the community. Because the nature of the start-up is a not-for-profit type, it presents itself with its own challenges and therefore, the business form still needs to be determined.

SESSION: 2

A systematic review of the association of religiousness to children's prosocial behaviour.

Isabelle Zammit
Institute of Community Services

Religion is a system of beliefs and practices that unites people into a community. Religiousness can be manifested through ideological, ritualistic, experiential, intellectual and consequential dimensions. Parental religiousness can guide children's morality and behaviours. In fact, several scholars are concerned if religion makes children into better citizens. To better understand the growing research on how religion relates to child development, and in particular, prosociality, a systematic review was conducted in Spring/Summer 2021. The focus of this review is children between the ages of three and ten years since these are the years of heightened religious and prosocial development. Eligible studies included published research on the association between religiousness and children's prosocial behaviour. From 1976 to May 2021, 203 studies were identified. Blinded double screening of abstracts and full text using the eligibility criteria, 100% agreement, identified a final sample of nine empirical papers. Data extraction included summaries of measures of religiousness and prosocial behaviour, methodological characteristics, and the associations. Narrative synthesis was used to address the three research questions. Six of the nine studies found a positive association between religiousness and children's prosocial behaviour. This systematic review found that religiousness is mostly measured through religious affiliations, and only three studies measured prosocial behaviour in general. The other studies focused on empathy and/or altruism as a prosocial construct. The studies in this review present a lot of variations across demographic variables, methodological characteristics, and overall quality. In addition to this empirical synthesis, the systematic review reveals that research in this area is scarce. This review concludes with implications for future research, such as a focus on the early years and the targets of children's prosocial behaviours.

MCAST Journal of Applied Research & Practice Special Issue on Sport, Exercise & Health

Renzo Kerr-Cumbo
Institute of Community Services

It is our utmost pleasure to announce this phase of preparation for the launch of the first special edition dedicated to Sport, Exercise & Health, on the MCAST Journal of Applied Research & Practice.

This special edition is dedicated to Sport, Exercise & Health and aims to contribute to the advancement of physical activity, exercise and sport knowledge, participation and performance in the small state of Malta, via sound scientific and academic research. It is also intended to encourage scholars, academics and sports/exercise scientists to engage with important and locally contextualised research problems, with a view to helping support the propagation of the fundamental principles of the Olympic movement.

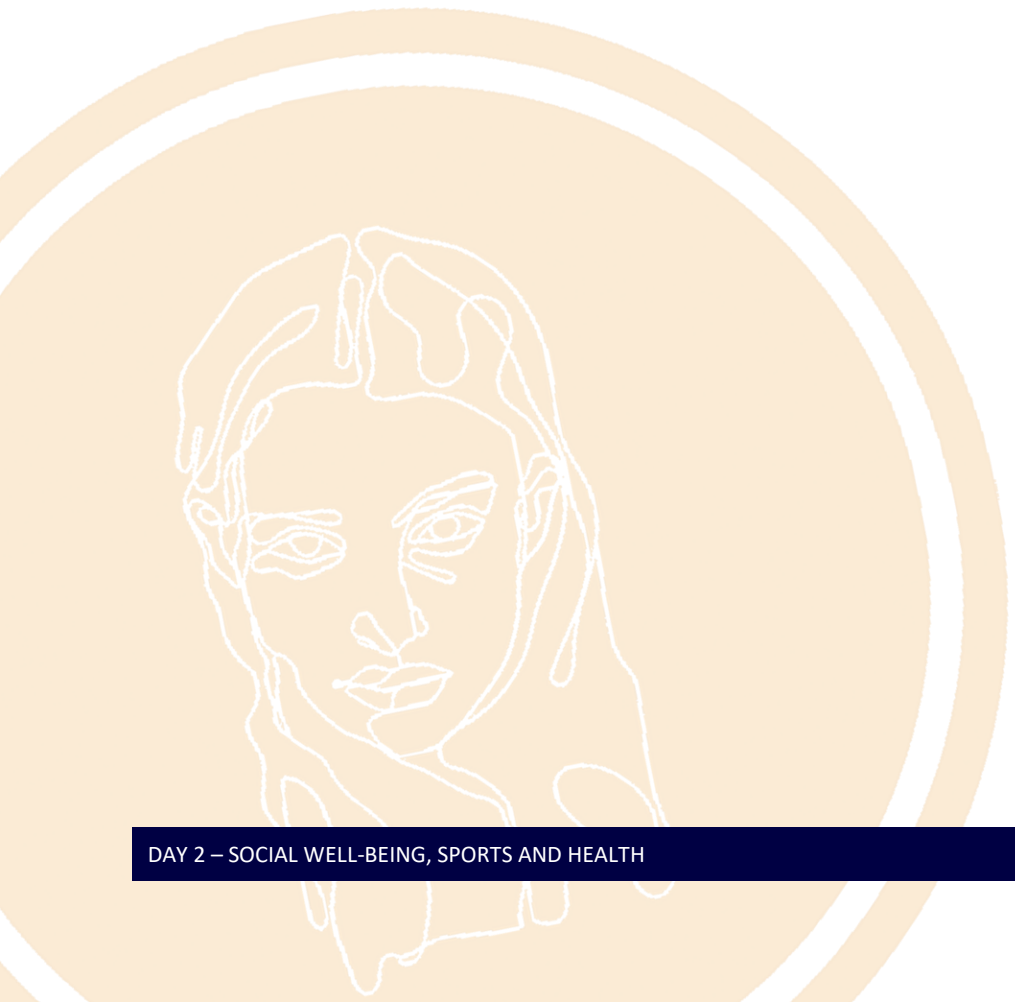
The Sport, Exercise & Health special edition considers multiple dimensions of physical activity, exercise and sport, including exercise and health, sports philosophy, management and administrative sciences, sports psychology, sociology and education, as well as physical activity and sports injury epidemiology, exercise physiology, biomechanics and nutrition science, among others. Research with a distinctly local scope is prioritised, contextualised in, for instance, Maltese issues, policy, culture, history, climate or geography (e.g. small nations phenomena, sports/physical activity tourism, aquatics, European and Mediterranean issues, etc). Work of more international scope is naturally also welcome, so long as it is also applicable/beneficial to physical activity and sports stakeholders in the Maltese context.

Mental health and social media: The lived experiences of MCAST students

Matthew Borg
Learning Support Unit

Main project: Mental health, stigma and social media: The lived experiences of MCAST students, is a research project that will set out to discover the main social drivers of mental health issues amongst our students at MCAST. This research proposal is practically an outcome of the Beyond GDP Report (2020), which was commissioned by the Commission of Justice and Peace. Following the final findings of the report, the Commission approached MCAST to propose research projects in light of the final recommendations. This report, amongst other things, clearly states that there is a lack of data regarding mental health in Malta, thus it encouraged me to come up with a proposal that sheds a light on this phenomena, specifically on our students at MCAST. Moreover, from my find outs, there is very little research at MCAST regarding the mental wellbeing of our students at the college. As suggested by the title, this social investigation will explore our students's mental health in light of stigma and the social media. These themes, although they are certainly correlated, they are not mutually exclusive and this sociological study will clarify this from the start. Ellul (2019) in her dissertation outlines that at MCAST the students are becoming more inclined to seek support due to two causes: unhealthy lifestyles and more awareness. Therefore, my intention is to dig deeper and get really close to the lived experiences of our students to better understand the social causations of mental health issues. For this reason, I am opting for a purely qualitative methodology based on unstructured interviews and focus groups with students. This sample should be cross-sectional to acquire more validity. I also intend to conduct focus groups with the main stakeholders in the field of youths and mental health; these should include the college's therapists, councillors, chaplains and student mentors. As indicated by the findings of Ellul's (2019) dissertation, students are leading unhealthy lifestyles and I propose that one of them is the excessive use of social media. In fact Rogers and Pilgrim (2021) state that "adolescents themselves perceive social media as a threat to their mental wellbeing, with some believing it to be the cause of mood and anxiety disorder, a platform for cyberbullying and the use of of social media itself was conceptualised as a type of 'addiction'." In all of this, both as a result of social media but not exclusively, stigma may still play a crucial role even though there is more awareness at MCAST. Stigma is "a culturally enduring phenomenon, maintained as much in degree and kind by social structures and cultural variations as it is by the response of individuals encountering deviant behaviour" (Pescosolido et al. 2013). Therefore, the research will critically explore the 'normalisation' of mental health as indicated

by the prevalent discourse of ‘awareness’ at the college. The research questions, directed both to the students and to the relevant stakeholders, will intend to discover the possibility of stigmatisation in a social environment which professes an increased level of ‘mental health awareness’ and also analyse the effects of the constant pervasiveness of social media in the context of young people’s lives. Comparing and contrasting both sets of data is paramount and certainly enriching for the scope of this research.



Healthy Dating

Delicia Farrugia, Sherika Micallef Seychell
Institute of Community Services

Since 2010 the number of reported domestic violence cases in Malta has more than doubled. Around four cases are being reported daily. In addition to this, the rate of convictions remains comparatively low. Research also shows that when violence and abuse has taken over a relationship, the outcomes are very negative and very hard to reverse. This emphasizes the importance of concentrating on programmes of prevention of abusive relationships before they actually develop and consolidate. Teenagers are a well suited cohort to start targeting these prevention programmes given that they would be starting to experiment with dating and forming new romantic bonds.

This research will focus on the creation of a prevention program, intended to help learners recognize the differences between caring, supportive relationships, and controlling, manipulative, or abusive dating relationships. The program will be designed as both a preventive, as well as an intervention tool. The project aims to positively impact the development of skills needed to create healthy relationships, that are effective across genders, and ultimately promote positive effects on both victimizing and perpetrating behavioural outcomes.

Prior to implementing with this program the selected cohort will be asked to participate in a pre-test survey. Following their participation in the intervention programme, participants will be asked to complete a post-test survey, in order to access this program's effectiveness. The data from the latter will also be compared to data from other cohorts with whom the programme was not carried out. Like this, we would be able to better evaluate whether the pre-test and post-test scores are related to the intervention programme or whether these could be related to other outside random factors.

Complementing Collaborative Practices: A Case Study in a Secondary Church School Setting

Heathcliff Schembri, Claire Sciberras
Institute of Community Services

Collaboration between teachers and Learning Support Educators is crucial for the smooth running of an inclusive classroom setting. It is often noted that while in primary school settings in Malta such collaboration is frequent and happens more naturally, in secondary school settings this is often perceived as problematic and presents a number of challenges. This quantitative study aims to gather the opinions of teachers and Learning Support Educators in a secondary church school setting in Malta about what can be learnt from current practices to strengthen collaboration between educators in the context of the COACTION Model.The researchers were approached by the School Leadership Team of a particular secondary church school in Malta and expressed their wish to learn more about ways how to promote collaboration across all year groups. The School Leadership Team also explained how they would like to implement an action plan within their School Development Plan which is evidence-based and stems from the experiences of the educators working at this school. This research is innovative as two researchers from outside the school setting are involved to help the school community address a gap through bottom-up research. During the scholastic year 2020-2021, the two researchers have carried out professional development sessions with the teaching staff which served both as an introduction to the project but also as capacity building. During the scholastic year 2021-2022, the researchers are carrying out further professional development sessions and gathering quantitative data from two sets of questionnaires. Through these questionnaires, the researchers shall gather information about current and future implementation of the COACTION Model (Clarity in roles; Open Communication; Accountability; Conflict Resolution; Trust; Intrinsic Motivation; Optimistic Approach; Nurturing Attitude). This data will then be analysed and the research will reach its final stage where a whole-school action plan is designed and implemented.

Quality Pedagogy and Effective Learning

Pedagogy training denotes the systemic collection and analysis of data connected to the field of Education, amongst which; student learning, development and human attributes, teaching methodology, teacher training, student retention, classroom dynamics, educational organisations, and educational strategies that contribute to the educational outcome. At MCAST there is a focus on Early Years research and Inclusive Education. A recurring theme within this area is multicultural education. As a higher education institution, it is only fair that a number of researchers are focusing their attention on issues related to tertiary education and how the learning experience at MCAST can be improved for students of all levels.

Learning Technologies research theme provides a setting for the sharing of the latest theories, applications, and services related to planning, developing, managing, using, and evaluating information technologies in academic and vocational education, multimedia learning, as well as other innovative educational technologies like intelligent systems, AR and VR.

SESSION: 1

Encouraging Multicultural Education through Modern Outdoor Sustainable Set-ups for Early Childhood

Simone Restall
Institute of Community Services

This ongoing research project intends to develop to its implementation stage. Following a previous literature review, it continues to monitor the implementation of outdoor sustainable play areas, being set up in a local school. This pilot project aims to be an example for monitoring, observing and recording the improved educational attainment of kinder children. It is intended to be a tool for their improvement towards the quality of their normal play, compared to that when interacting with real life natural and recycled materials, built for them to play with within the school grounds and outside. This hands on discovery teaching and learning methodology aspires to offer opportunity for an interaction with nature and natural materials, offering life skills necessary for future smart living, for our next generation citizens. It is envisaged to produce a professional problem-solving workforce and multicultural society equipped with creative, imaginative and practical attitudes to interact successfully within a globalized world. The project is designed as an action research investigation which documents the results achieved by the experiment when comparing past and present levels of attainment on the children's part, aiming

to prove improved results. It is planned to become a benchmark, applied and followed by schools on a national level.

The Role of Entrepreneurship as a subject in Vocational Education and Training Context: Taking MCAST as a case study

David Pace, Ivan Briffa
Institute of Information And Communication Technology

Entrepreneurship education – a topic that can be considered pivotal to a small country's economy such as Malta. However, it is important to understand the importance that this taught subject is given by different stakeholders – students, educational institutions, and industry. The role of Entrepreneurship educators is far more than delivering the subject. It is of utmost importance that such units are designed in a way that keep students intrigued and wanting to explore more about the subject. This can happen both in cases when students are inclined to start their own business ventures, and also when students are prospective employees within industry. It can be said that entrepreneurial skills are increasingly being sought after by various stakeholders. Within VET institutions like MCAST, where students benefit greatly from experiential learning, Entrepreneurship educators must be creative to entertain the requirements of VET students. Chalk-and-talk approach is a thing of the past. While exploring and implementing different methodologies relevant for individual VET institutions, educators should monitor the progress of student interest, attitude and skills acquired through successive cohorts, in parallel with changes to syllabi designs. This paper focuses on the students' perception of Entrepreneurship as a taught, compulsory unit at MCAST. Results will be compared to what other higher educational institutions worldwide are experiencing. This would be a first step in a series of studies that will delve into the perception of various stakeholders with regards to Entrepreneurship education at MCAST, with the ultimate goal of providing suggested guidelines and recommendations to further improve Entrepreneurship education within this VET institution.

Keywords: Entrepreneurship; Vocational Education and Training (VET); Entrepreneurship Education; Teaching Methodologies; Transversal Skills; Employability Skills; MCAST; Higher Education;

EIT Climate KIC Malta Hub

Nika Levikov, Suzanne Maas, Gonca Kara
Applied Research And Innovation Centre

EIT Climate-KIC is the EU's climate innovation initiative, working to accelerate the transition to a zero-carbon and resilient world by enabling systems transformation. As a Knowledge and Innovation Community (KIC), it brings together more than 400 partners from business, academia, the public and non-profit sectors to create networks of expertise, through which innovative products, services and systems are developed, brought to market and scaled up for impact.

While EIT Climate-KIC has been working since 2010, its activities reached Malta in 2016 when the EIT Climate-KIC Hub was established. It has been a challenging, yet beautiful journey to bring innovation expertise and a diverse, ambitious network to the island.

Given Malta's unique geographic setting, it is highly susceptible to climate change and its effects. The Maltese government has identified innovation as one of the key ingredients to not only come up with necessary solutions to climate change, but also for catching up with other smaller European Union member states in terms of industrial and academic performance. Malta forms part of the Regional Innovation Scheme (RIS) under the European Institute for Innovation and Technology (EIT), helping to develop the country's local innovation ecosystem while boosting its potential to tackle the adverse effects of climate change.

In 2019, the Hub expanded and welcomed two new organisations: AquaBioTech and the current Hub Coordinator, the Malta College of Art Science and Technology (MCAST). In 2020, the Hub on-boarded the Energy and Water Agency. Together, these entities are working towards implementing strategic programmes in education and entrepreneurship. The Hub is working closely with key stakeholders, including the Ministry for Environment, Climate Change and Planning (MECP), to achieve national environmental and climate targets and boost Malta's capacity to take on innovative projects whilst creating links among local entities working towards similar climate goals.

The acceptance of learning management systems and video conferencing technologies: Lessons learned from COVID-19

Mark Anthony Camilleri[1,2], Adriana Caterina Camilleri[3]
Institute of Community Services

During the outbreak of the Coronavirus (COVID-19) pandemic, higher education institutions (HEIs) have shifted from traditional and blended learning approaches to a fully virtual course delivery. This research investigates the students' perceptions on remote learning through asynchronous learning management systems (LMS) and via synchronous video conferencing technologies like Google Meet, Microsoft Teams or Zoom, among others. The data was gathered from a sample of 501 higher education students in a Southern European context. A survey questionnaire included measures that investigated the participants' acceptance of interactive technologies to better understand their utilitarian motivations to use them. A structural equations modelling partial least square approach (SEM-PLS) was used to analyse the results. The findings suggest that the research participants accessed asynchronous content and interacted with online users, including with their course instructor, in real time. While there are a number of theoretical or opinion papers on the impact of COVID-19 on higher education services, currently, there are still a few empirical papers that shed light on the factors that are having an effect on the students' attitudes and intentions to utilize remote learning technologies. This contribution underlines the importance of maintaining ongoing, interactive engagement with students, and of providing them with appropriate facilitating conditions, to continue improving their learning journey.

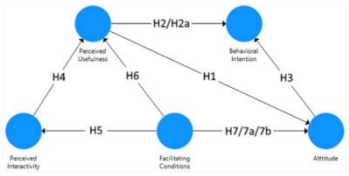


Figure 1. A research model that investigates the individuals' intentions to use remote learning technologies

Table 2. The survey questionnaire's constructs and their corresponding items

Construct		Items
Perceived Usefulness (Cheng & Yuen, 2018; Lin et al., 2013; Ngai et al., 2007).	PU1	Remote learning is useful.
	PU2	Remote learning increases my chances of learning.
	PU3	The remote learning technologies help me learn things.
	PU4	Remote learning improves my learning outcomes.
Perceived Interactivity (Chattaraman et al., 2019; Chen et al., 2007; McMillan & Jang-Sun Hwang, 2002).	PI1	I would use the remote learning technologies' multimedia features.
	PI2	I would click through the remote learning technologies' online resources.
	PI3	I would participate in online discussions with the course instructor and my peers.
Facilitating Conditions (Hoi, 2020; Dečman, 2015; Venkatesh et al. 2003; 2012).	FC1	I have the resources necessary to use remote learning technologies.
	FC2	I have the knowledge necessary to use remote learning technologies.
	FC3	I can get help from others when I have difficulties using remote learning technologies.
Attitude (Rana et al., 2019; Ahmed & Ward, 2016; Shih, 2008).	ATT1	The quality of education that is provided through remote learning technologies is good.
	ATT2	I like using remote learning technologies.
Behavioral Intention (Ahmed & Ward, 2016; Cheon et al., 2012).	BI1	It is very likely that I shall continue using remote learning technologies in the future.
	BI2	Probably, I will use remote learning technologies in my daily life.

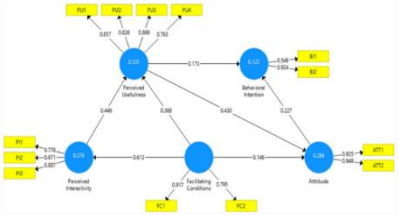


Figure 2. A graphical illustration of the results

Table 1. A non-exhaustive list articles that explored the use of online learning technologies in higher education

Education technology paradigm	Authors
Blended Learning	Thai et al., 2017; Porter et al., 2014; López-Pérez, Pérez-López & Rodríguez-Ariza, 2011;Gikandi et al., 2011; Ozkan & Koseler, 2009.
Computer-assisted learning, Computer-based instruction, Computer-based learning, Computer mediated learning.	Di Mitri, Schneider, Specht & Drachsler, 2018; Baturay, Gökçearslan & Ke, 2017; Lambić, 2016; Sung, Chang & Yang, 2015; Soflano, Connolly & Hainey, 2015; Vanderhoven, Raes, Montrieux, Rotsaert & Schellens, 2015.
Distributed learning, distance learning	Boelens, Voet & De Wever, 2018; Chen, Wang, Kinshuk & Chen, 2014; Viberg & Grönlund, 2013; Ocak, 2011; Heilesen, 2010.
Electronic learning (elearning)	Jeno, Grytnes & Vandvik 2017; Gómez-Aguilar, Hernández-García, García-Peñalvo & Therón, 2015; Soflano, Connolly & Hainey, 2015; Cruz-Benito, Therón, García-Peñalvo & Pizarro Lucas, 2015; Agudo-Peregrina, Iglesias-Pradas, Conde-González, Hernández-García, 2014; Ng, 2012; Lee, Hsieh & Hsu, 2011; Wang, Wu & Wang, 2009; Motiwalla, 2007.
Mobile learning (mlearning)	Crompton & Burke, 2018; Sánchez-Prieto, Olmos-Migueláñez & García-Peñalvo, 2017; Briz-Ponce, Pereira, Carvalho, Juanes-Méndez & García-Peñalvo, 2017; Sung, Chang & Liu, 2016; Cochrane, 2014; Wu, Lee, Chang & Liang, 2013; Valk, Rashid & Elder, 2010; Wang, Wu & Wang, 2009; Motiwalla, 2007.
Online learning, online education	Kurucay & Inan, 2017; Liyanagunawardena, Adams, Williams, 2013; Gikandi, Morrow & Davis, 2011; Klašnja-Milićević, Vesin, Ivanović & Budimac, 2011; Liu, Chen,Sun, Wible & Kuo, 2010; Sun, Tsai, Finger, Chen & Yeh, 2008.
Virtual learning, virtual education	Makransky, Terkildsen & Mayer, 2019; Rienties & Toetenel, 2016; Fowler, 2015; Agudo-Peregrina, Iglesias-Pradas, Conde-González & Hernández-García, 2014; Dalgarno & Lee, 2010; van Raaij, E.M. & Schepers, 2008.

1. *Department of Corporate Communication, Faculty of Media and Knowledge Sciences, University of Malta, Malta. Email: mark.a.camilleri@um.edu.mt*
2. *The Business School, University of Edinburgh, Edinburgh, Scotland.*
3. *Curriculum Department, Malta College of Arts, Science and Technology, Malta.*

SESSION: 2

Enhancing Student Engagement Through Application of an Integrated Simulation and Assessment in Donning and Doffing for Healthcare Professionals (iSADD)

Neville Schembri, Phyllis Farrugia Abanifi, Jonathan Vella, Dorianne Cachia
Institute of Applied Sciences

To date, donning and doffing of Personal Protective Equipment relies on specific written guidelines. The iSADD research project (funded by Malta Council for Science and Technology under the Research Excellence Programme) aimed to build and test an innovative technology which could be the first step towards providing an attainable solution than the traditional methods of training and can support Health Care Professional educators in providing an enhanced simulation environment. The project was a joint collaboration between MCAST lecturers from the Institute of Applied Science and the the Institute of Information and Communication Technology.

Initial testing of the application presented a sound basis for an innovative tool which provides clear signage and visual alerts in a classroom setting going beyond traditional teaching methods. On application, it was found to be effective and can provide simulation which does not allow trainees to progress further during a donning/doffing educational process if this is done incorrectly. Student engagement and enhanced active learning was positively noted and reported..

Such interdisciplinary collaborations with educators ranging from diverse technical and professional backgrounds are highly beneficial in enhancing, developing and introducing innovative teaching pedagogies in clinical simulation education.

Challenges and Suggestions to Deliver a Degree in a Prison Context: An adaptation of a current BA in Fine Art.

Pierre Mifsud, Carmen Aquilina
Institute of Creative Arts

Understanding that education in prison is a right and not a luxury is not a natural conclusion to many. Nonetheless, research has shown that all education, be it correctional, formal, or non-formal education, helps in preparing inmates with several social skills that will help inmates to obtain employment once released from the prison and decrease the rate of recidivism. Establishing the importance of the arts in prison was also another important stage before trying to define possibilities and limitations for a prison inmate to follow the MCAST Bachelor of Arts (Honours) in Fine Art. This was mainly established through desk-based research. However, supporting this were other methods applied in this research. These included meetings and interviews with staff working at MCAST, UOM and CSA, as well as direct encounters with educators while leading a programme offering a training and development opportunity for adult educators to work in a prison environment.

With the gathered data the research paper aims to: share pedagogical styles needed within an educational setting in prison; how educators can adjust to the realities of prison learning environments; how can the B.A Fine Art programme be adapted to these realities; and to what extent can these limitations hinder or otherwise the entirety of the programme. In conclusion, the research also aims to propose a way forward where the said adaptations can be embraced by other MCAST vocational programmes.

Triggers of Worry and Stress in Young Students: Presenting Findings

Melanie Darmanin
Institute of Community Services

Much of the current literature agrees that during childhood, children may experience feelings of stress and worry, some of which might be triggered within the school context. Given this claim, the findings outlined in this presentation elaborate on the causes of such triggers and therefore address the question: 'What triggers feelings of stress and worry in young students and which forms of action are taken by parents in order to address such feelings?' The findings were gathered through an online questionnaire which was filled by one hundred and eighteen parents or guardians of children aged between three and eight years. As extenuated in Figure 1, the findings indicated that the most prevailing trigger of stress and worry was linked to social factors; namely separation concerns, transitions, and social relationships. Data further revealed that other triggers for stress and worry were linked to academic factors such as reaching a specific academic level and participating in summative forms of assessment. Whilst being less common, logistical and situational factors were also linked to triggers of stress and worry. In this vein, spending long hours at school, language barriers and the Covid-19 pandemic were all listed as triggers by some of the participants. Findings focused on the form of action parents took in such instances and in most part included the elements of guidance, discussions, and offering words of reassurance. A significant finding indicated that the school staff were not often approached and informed about such triggers. The justification for this varied but the most prevailing reasons showed that this was either because the trigger was viewed as a minor stressor or because the main trigger was directly linked to the system or approach adopted by the school or the classroom teacher.

Writing that dissertation: exploring the academic writing challenges of undergraduate IBMC students

Melissa Joan Bagley
Institute of Business Management and Commerce

In recent years, MCAST has introduced a number of degree courses to meet the evolving needs of the local industry. The dissertation, arguably the most demanding piece of writing to be experienced by undergraduates, tests the independent research skills students have acquired over the duration of their degree course. However, dissertation writing places demands on the undergraduate student, such as the need for proficiency in language composition as well as rhetorical styles particular to the discipline. MCAST students may be particularly challenged as students progressing to higher level courses from vocational courses are very likely to find academic literacies novel after following language courses with a strong vocational orientation. To understand the challenges of learning new academic literacies, a qualitative mode of inquiry is being adopted, using a case-study design utilizing ethnographic methods typically used in understanding literacy practices in their social and cultural contexts. This would involve investigating how students navigate the complex demands that dissertation writing places upon them, looking into issues such as everyday literacy practices, attitudes to reading and writing as well as language background and proficiency. Moreover, it seeks to understand tutors' insights and perspective of the dissertation writing process, focusing on their experience as tutors and the challenges encountered while supervising. 'Unpacking' the dissertation writing process at different levels of production, primarily from the student-tutor point of view, is arguably important to critically reflect on the process of thinking, reading and writing. It is hoped that this exploratory study will provide constructive feedback for the benefit of stakeholders concerned, for students, tutors and management. This may lead to a deeper understanding of challenges that are not immediately visible to all stakeholders involved.

Reinventing the teaching of mathematics post-COVID-19

Marouska Zahra Micallef
Learning Support Unit

The COVID-19 pandemic has brought with it many constraints on the teaching of mathematics. Particularly, educators had to switch instantly to online platforms when they had little or no experience of online teaching. Educators were faced with a situation where they needed to relearn ways of teaching mathematics within the constraints imposed by the pandemic. Inspite of the difficulties, this gave rise to innovative ways of teaching mathematics, and provided an opportunity for teachers and students to find new ways of interacting and working together.

The aim of this study is to explore how mathematics lecturers at MCAST embraced this change in teaching, with all its challenges, struggles and opportunites. What type of pedagogy was being used in mathematics education during the COVID-19 pandemic? Khirwadkar et al (2020) observe that switching to online teaching did not involve simply adapting face-to-face pedagogical strategies to a prescribed curriculum, but rather finding other pedagogical strategies while understanding that 'what is not forbidden is allowed'; this in turn 'opens a space of opportunities for reimagining mathematics education' (p.45).

However, this study will also explore the vision of mathematics lecturers for the post-COVID-19 period. What pedagogical lessons were learnt from the experience of teaching during the pandemic? Will these experiences enrich their future mathematics teaching? In their research on online mathematics teaching during the pandemic, Ní Fhloinn and Fitzmaurice (2021) conclude that lecturers 'have amassed experience, knowledge and resources that will complement their face-to-face teaching moving forward' (p.15).

Hence, this current study will not only seek to "understand the emerging educational realities in the context of the COVID-19 pandemic", but will also explore the way forward in mathematics teaching at MCAST (Khirwadkar et al, 2020,p.45). Focus will be on the teaching of Mathematics Key Skills at MCAST, and data will be collected by means of semi-structured interviews with a sample of mathematics lecturers. This will be followed by qualitative thematic analysis.

References:

Ní Fhloinn, E. & Fitzmaurice, O. (2021). 'Challenges and Opportunities: Experiences of Mathematics Lecturers Engaged in Emergency Remote Teaching during the COVID-19 Pandemic', Mathematics, 9 (18), pp. 2303.

Khirwadkar, A., Khan, S.I., Mgombelo, J., Snezana, O-R., & Forbes, W.A. (2020). 'Reimagining Mathematics Education During the Covid-19 Pandemic'. A Journal of Educational Research and Practice, 29 (2), pp.42-46.

Environmental and Cultural Sustainability

Research within the environmental domain is vital for a sustainable future and is highly relevant for a broad spectrum of stakeholders, including society. Extensive research has been conducted at MCAST within this area, and has contributed, but is not limited to, nature-based solutions, biodiversity, research for a better understanding of certain aspects of the ecosystems, animal husbandry, fisheries and other food production areas. This thematic area also covers research on the identification of a number of polymers and surfaces with photocatalytic potential, as well as areas such as water efficiency, water quality, water meter research and apparent water losses, and water treatment. Research endeavours under this thematic area has seen collaboration with multiple stakeholders, both on a national and international level, with some of the research being supported through external funding including H2020.

One of the main United Nations Sustainability Development Goals addresses sustainability at large, and one of the most essential components is sustainability of cultural heritage. Research is currently being carried out in the creative arts institute at MCAST, which addresses such cultural heritage issues along with scientific studies in restoration that support research in the aesthetic value of Maltese artefacts. Current research focuses on restoration of Maltese balconies, research on Maltese embroidery, and the history of theatrical hubs in Maltese religious institutions.

ENVIRONMENTAL AND CULTURAL SUSTAINABILITY

SESSION: 1

The media preferences of Maltese Millennials

Carmelina Frendo
Institute of Business Management and Commerce

The effectiveness of any communication campaign depends on the selection of media, which must match the media preferences of the target audience. Literature shows that millennials represent the largest age generation and accounts for 50% of global consumption. The most common definition in research about this generation is the part of the population born between 1981 and 1996. Failing to understand millennials will lead to inefficient communication strategies aimed at this generation. This study investigates the media preferences of millennials in the local context. To attain the research objectives an in-depth desk research which had reviewed literature about millennials over the last years was carried out. This was followed by a survey study with a representative sample of the Maltese millennials. Although no researcher excluded the traditional media from the communication with millennials, the traditional media alone is not effective in communicating with millennials. They need to be approached through the new interactive media. Millennials favour mainly the social media, the most preferred social platforms being facebook and Instagram. Gen Y continuously look for information online and follow current events online. Nevertheless, millennials still watch television, they do notice outdoor advertising on billboards, and they listen to the radio while driving. Millennials neither read direct mail nor the newspaper. Millennials are attached to their smart phones and use mobile apps. They prefer laptops to tablets. Generation Y consider public events as important in raising awareness and to educate the public about current issues, but, they are reluctant to attend to these events. Gen Y are loyal to websites that offer truthful information. They are attracted by virtual advertising, animations, videos, e-coupons and e-discounts. They are influenced by online influencers, but electronic word-of mouth is a more powerful influencer. The study contributes to the knowledge about the consumer behaviour of local millennials.

Key words: communication strategies, millennials, media preferences, traditional media, interactive media.

A preliminary study on the effect of different feeding regimes on the physiochemical characteristics of local sheep's milk.

Joseph Jason Abela
Centre for Agriculture, Aquatics and Animal Sciences

Herding of sheep was part of the Maltese food supply chain for a long time. Sheep were mainly kept for milk, meat and wool. Local sheep milk was and is still in use for cheese production especially cheeselets. The participants in this study were local sheep that were fed different feeding regimes. In total 6 farms were identified. These were scattered through the main island with four different feeding regimes. Milk samples were collected during early, mid and late lactation. Samples were taken directly from the pail or milk tank before starting the process to transform this milk into cheeslets, i.e., exactly after milking. Samples were analyzed the day after in the laboratory using the Lactoscan SP milk analyser. Data gathered included fat percentage, protein, lactose, freezing point and salts. The best milk fat results in this research were obtained by the group fed concentrates, dried hay and went for an hour grazing per day. The group fed concentrates and got access to three hours of grazing per day got the best results with regards to protein, lactose, and salts content in the milk. This means that good energy:protein ratio in the feed is important as all ingredients found in the raw milk have an important function. Therefore, reaching the best level of each is the main priority for the farmer to obtain a final product of good quality.

Keywords: Milk chemical composition, sheep milk quality, feeding regimes, milk analysis, raw milk.

Flight over fields; bats and birds in Mediterranean agricultural landscapes

Ian Falzon
Institute of Applied Sciences

This project aims at establishing a preliminary biodiversity inventory determining which species of bats and birds frequent the most common typologies of agricultural land during Autumn and Winter.

Bird monitoring has the potential to be an effective indicator of the health of the environment and a tool for assessing the environmental policy process and the effectiveness of conservation measures. In Europe there are 500 wild bird species, and 32% of these species are not in a good conservation status. The Directive mentions the protection of habitats for endangered and migratory species, part of which are agricultural in nature. In the EU, various monitoring programmes and yearly bird surveys such as the Pan-European Common Bird Monitoring Scheme (PECBMS) and the Breeding Bird Survey (BBS), are carried out and help achieve a good management of species and habitats. Monitoring which Malta has yet to fully fledge.

Bats are a vastly diverse group of species that have adapted to a wide variety of habitats, including urban and other anthropogenic habitats such as agricultural land. This study aims to determine which of the resident bat species frequent agricultural land and if there are distinct preferences towards a certain type of landscape.

This research hopes to increase the awareness on the relationship between avifauna and Chiroptera and local agriculture. Perhaps most importantly this study will be significant for farmers and their industry by recognising the role they have not only as food producers but as stewards of the environment. A value which is very important to consider in an age when the property and land prices are at a steep incline and farmers are finding it ever harder to justify their land use and role. Furthermore, it starts shedding light on beneficial behaviours such as natural pest control, cross-pollination and seed propagation amongst others.

Identification of selection criteria for the Black Maltese Chicken breeding program

Paul Spiteri, Robert Debono
Centre for Agriculture, Aquatics and Animal Sciences & Institute of Applied Sciences

Grading templates and phenotypic of black Maltese roosters and hens is a sensitive parameter in which the breed standard is recognized authentically. In this semester of study a clear overview about these criteria is explained sensitively, answering an

important question about the breed standard specifically. A sensitive approach which during various stages may see individual hens and roosters eliminated from the breeding program. It is very important to note that eliminated rooster and hens from the breeding program are just stopped from continuing to surpass their genetic potential to future generations. On the other hand, the phenotypic characteristics endorsed by G. ATTARD1, P. AQUILINA1, et al "Origin and complete breed standard of Maltese Black breed" in 2016 are surely given prominence and conservational efforts within individuals that highly express them. Within a practical manner specimen demonstrating admirable phenotypic characteristics is awarded a full mark of 1. Less admired characteristics are awarded a 0 while negative marking also takes place and clearly punished with a -1 or an aggressive -2. In the end the whole group of roosters and hens are systematically divided according to the points they are carrying. Needless to say, that most of the specimen containing high marks are further systematically bred to achieve the so referred as the desired phenotypic characteristics as identified by G. ATTARD1, P. AQUILINA1, et al. An idea of these characteristics expressed include broad shoulders, broad breast and black plumage awarded a nice 1+ if expressed in the specimen at a mature stage.

Grading template for phenotypic selection of Black Maltese cocks and hens

Criterion	Points Allocated
Broad shoulders	1
Broad Breast	1
Black Plumage	1
White plumage	-1
Red Plumage	0
White skin	1
Yellow skin	0
Single comb *	1
Defect in comb *	-2
5 spikes in comb *	1
6-7 Spikes in comb *	0
Over 7 spikes in comb *	-1
Upright comb *	1
Comb not upright *	0
White ear lobe	1
Ear lobe any other colour / tinted	-1
Well demarcated ear lobe	1
Ear Lobe not well demarcated	-1
Amber eyes	1
Eyes any other colour	0
Horn & slate Beak	1
Black beak	0
Horn Beak	0
Slate legs	1
Yellow legs	-1
Feathers on legs	-1
No feathers on legs	1

SESSION: 2

Recognition of Underutilised Maltese Marine Species

Kimberly Terribile, Juan Jose' Bonello, Daren Scerri, Frankie Inguanez
Institute of Applied Sciences

The biogeographic location of the Maltese Islands at the centre of the Mediterranean Sea act 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. Globally, the ever-persistent demand for mainstream marine species is resulting in tighter species quotas and supply shortages, thus, calling for responsible consumerism, to include consumption of underutilised marine species.

The adoption of artificial intelligence (AI) to support the sustainability of related human activities in our oceans has been recognised. Therefore, the overall aim of this research is 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.

Integrating AI within the public's utilisation of fish would facilitate and enrich the knowledge in decisions about our food consumption and preferences. A large custom dataset of these underutilized species and their features is called for. Existing solutions are currently not refined to distinguish or classify down to species level. In addition, there is no local solution that may be used to verify marine species that occur locally or a solution that provides related nutritional information. 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 of local marine species, the promotion of underutilised fish and the provision of nutritional information for each marine species.

This project is an inter-institute collaboration involving researchers from the Institute of Applied Sciences (IAS) and the Institute of Information and Communication Technology (IICT) and is being worked out in collaboration with the general public as well as through samples that are collected by the Department of

Fisheries and Aquaculture within the Ministry for Agriculture, Fisheries, Food and Animal Rights.

IMPACT - Identifying Microplastic Hotspots in the Maltese Waters

Juan Jose Bonello, Frederick Lia
Institute of Applied Sciences

Identifying Microplastic Hotspots in the Maltese Waters - IMPACT (GA: PRD 002) is supported under the PARADISE Call for Start-up Actions 2020-Malta Council for Science and Technology.

Europe is the second global producer of plastics, dumping about 150,000 to 500,000 tonnes of macroplastics and from 70,000 to 130,000 tonnes of microplastics in the Mediterranean Sea each year. Research about microplastics has been increasing through the years, however, there are relatively few studies that have evaluated the presence of microplastics in the Maltese marine environment. Present studies have been mainly generated through one-off studies rather than from long-term monitoring research and most of the studies focus on marine litter with little reference to microplastics.

The IAS within MCAST, AquaBioTech Group and Żibel have teamed up together to work on IMPACT - Identifying Microplastic Hotspots in the Maltese Waters. The project involves collecting seawater samples from all around the Maltese islands and analysing the samples for microplastics. This is done in order to quantify and characterise microplastics in Maltese waters. This will enable the compilation of a map of microplastics hotspots in the coastal waters around the Maltese Islands.

This information will serve to better understand the distribution of microplastics, and the implications of their presence in certain areas. Through the collaborative approach adopted in this project, key players in the field of research and education, and stakeholders are working together to promote the safeguarding of our natural environment.

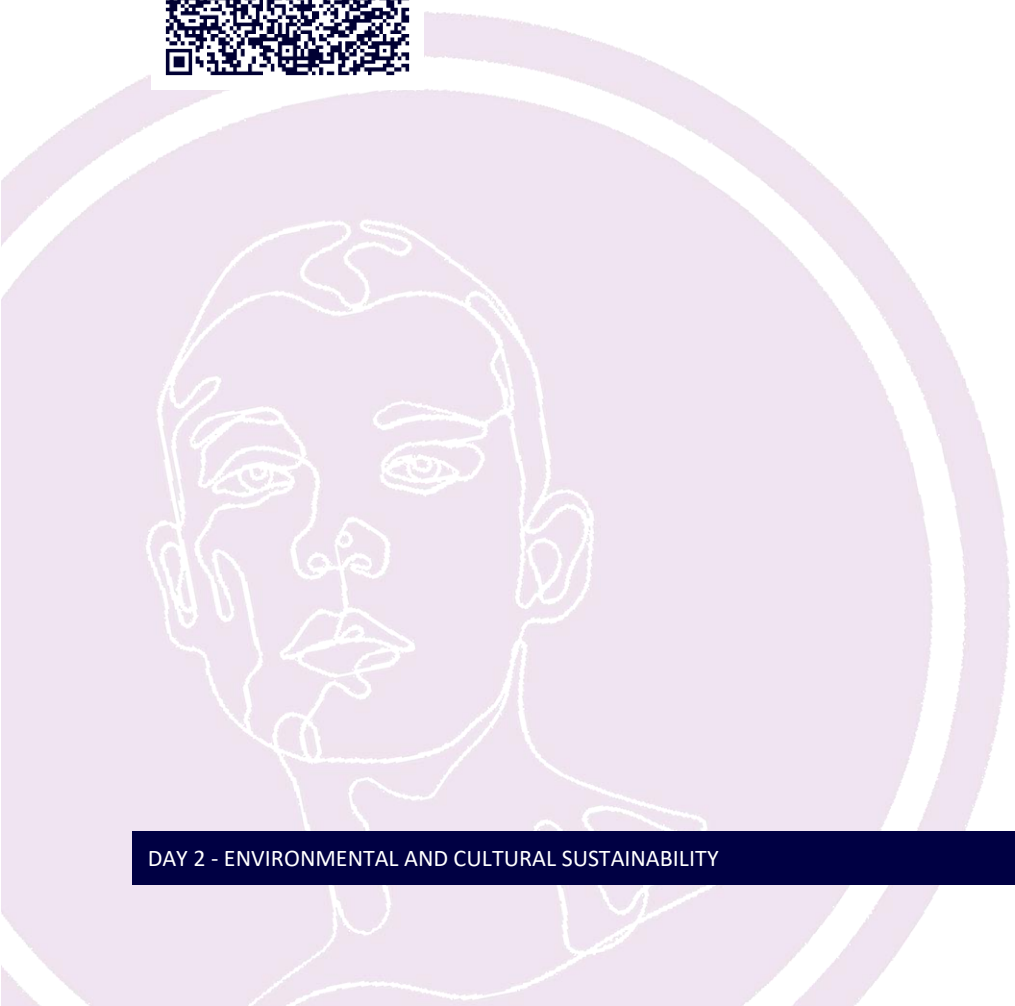
Project IMPACT aims to understand the nature and distribution of microplastic within Maltese waters. Whilst microplastics do not fall directly within the scope of Directive EUR 2019/904, they are considered specifically in descriptor 10 of the Marine Strategy Framework Directive [10.1.3 “Trends in the 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 aligns 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.

IMPACT (GA: PRD 002) is supported under the PARADISE Call for Start-up Actions 2020-Malta Council for Science and Technology.

MCAST Energy contribution towards EU 2050 climate-neutral vision

Brian Azzopardi, Somesh Bhattacharya, Marcin Pinczynski
Institute of Engineering and Transport

The EU aims to be climate-neutral by 2050 – an economy with net-zero greenhouse gas emissions. MCAST Energy, established in 2014, has worked on various externally funded projects that contribute directly to the EU vision on a local and international community level. In this presentation our research outputs of two H2020 projects JUMP2Excel.eu and NEEMO-project.eu, coordinated by MCAST, will be highlighted through their research themes and current endeavors.



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