



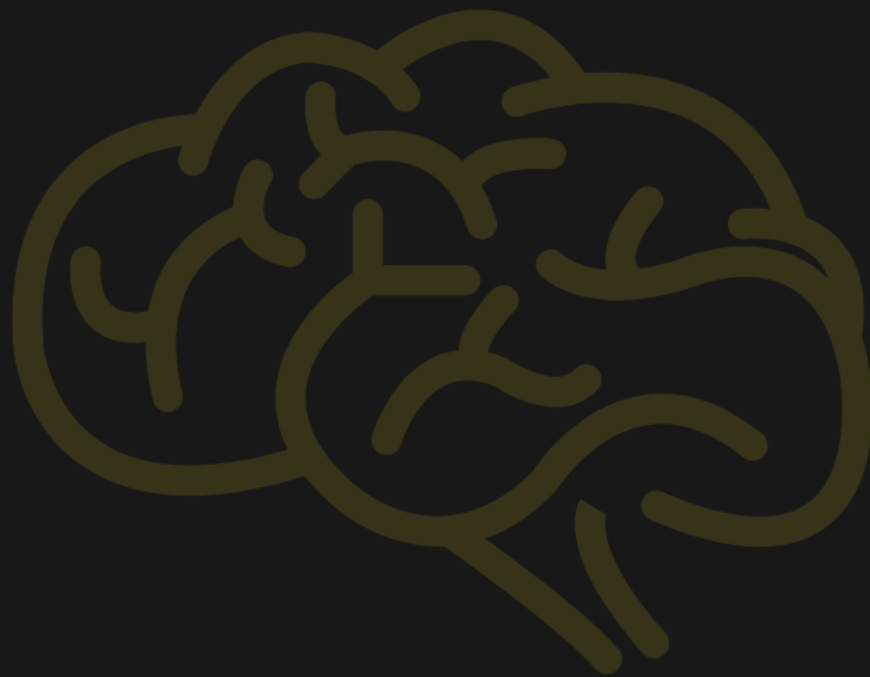
THE FIRST

# MCAST Research Symposium

2019

Applied Research Themes

Research *by* Masters students *for*  
Masters students



JULY 6, 2019

08:30 - 13:30



IAS Auditorium  
MCAST - Paola

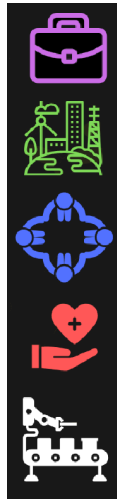


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MCAST Research Symposium Steering Committee  
**Alex Rizzo, Joseph Falzon, Stephen J. Hall**

Editorial Board

Production Manager - Joseph Falzon | Design, Layout & Editing - Stephen J. Hall | Cover Design - Edwin Zammit

# MCAST Research Symposium July 2019

8:30 — 9:00 **Registration**

9:00 — 9:20 **Welcome Address**

**Dr Architect Joseph Falzon**

**Dr Ing. Alex Rizzo**

**Dr Nadia Maria Vassallo**

**Keynote Message**

**Hon Evarist Bartolo** - Minister for Education and Employment

**Mr Frederick Schembri** - President of the Board of Governors

**Prof Joachim James Calleja** - Principal and CEO

9:20 — 9:35 **Presentation - Sustainable Development Goals**

**Dr Joseph Falzon / Mr Stephen J. Hall / Ms Eleni Tsitsirigou**

Applied Research & Innovation Centre MCAST

9:35 — 9:50 **Presentation— Masters in Vocational Education Applied Research 4.0  
 From Strategy to Practice**

**Dr Nadia Maria Vassallo**

Deputy Principal - Curriculum and Student Affairs MCAST

9:50 — 10:30 **Panel Debate— A Qualitative or Quantitative Methodology  
 Which one will set you up to fail?**

**Dr Ing. Alex Rizzo and Dr Ronald Aquilina**

Moderator: Mr Stephen J. Hall

## MCAST Research Symposium July 2019

10:30 - 11:30 **Paper Presentations - Moderator Ms Eleni Tsitsirigou**  
**Journal of Applied Research & Practice Volume 3, Issue 1, 2019**

**Doreen Susanne Micallef**

Physiological and Therapeutic Outcomes of Intermittent Fasting versus Calorie-Restriction Diet in Patients suffering from Metabolic Syndrome

**Theresa Demanuele Montebello**

Alleviating Poverty In Malta

**Daniel-Louis Tabone, Luke Vella**

Labour Migration into Malta and the Effect on the Maltese Economy

**Christian Camilleri, Luke Pace, Alex Rizzo**

Performance Analysis of Ageing Domestic Water Meters with Respect to Apparent Losses: A Case Study

**Rosienne C Farrugia**

Vocational Pedagogies for the Formation and Training of Early Childhood Educators: Perspectives of VET Lecturers and Level 5 Early Years Learners

11:30 - 12:00 **Scientific Poster Presentations of Research in Progress**  
 Coffee & biscuits

## MCAST Research Symposium July 2019

12:00 - 13:00 **Paper Presentations - Moderator Dr Mario Caruana**  
**Journal of Applied Research & Practice Volume 3, Issue 1, 2019**

**Robert Vassallo, Marco Dimech**

Irrigation-Water Demand in the Maltese Islands

**Colette Farrugia**

A Study of the Factors that Lead to Student Drop-Out

**Jesmond Agius**

Students' Perception of Global Warming on the Maltese Islands

**Kirsty Farrugia, Beverley Abela Gatt**

The Broken Rainbow: Same-Sex Intimate Partner Violence

**Josette Bonnici, Ronald Aquilina**

The Impact of Lecturers' Emotional Intelligence on Students

13:00 - 13:25 **Discussion—Moderator Dr Architect Joseph Falzon**  
 Exploring Potential Dissertation Themes

13:30 **Concluding Address**



The Ministry for Education and Employment positions itself at the forefront to provide present and future generations with the necessary skills and talents for employability and citizenship in the 21st century. Malta's education strategy is supported on seven key pillars that include governance of education organisations; social dimension; student focus; quality of education provision; international dimension; strategic innovation and performance dashboards. In order to achieve what we consider as realistic and ambitious targets we have called for collaboration of all stakeholders to come forward and develop our education framework starting from early childhood education and care to adult learning, vocational and tertiary education and encompassing formal, informal and non-formal learning.

While we seek home-grown solutions to address our challenges we look forward to learn from other in Europe, from European process such as the Bologna and the Copenhagen Processes and beyond, but knowing full well that we cannot simply import solutions from abroad without adapting and adopting them to our reality.

The United Nations Sustainable Development Goals [SDG] are presented in this First Mcast Research Symposium. The 2030 Agenda for Sustainable Development is a global commitment by the international community to wipe out poverty by sustainable development by 2030. It is comprised of 17 aspirational goals with Sustainable Development Goal 4 dedicated to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all".

Malta's education strategy is aligned with the SDG's and aims to cultivate student engagement and motivation, and to promote high aspirations in learning within an inclusive, safe and orderly environment both physical and psychological. Furthermore, the research endeavours presented in this symposium reinforces student participation as well as the teaching profession.

Research symposia offer participants another opportunity to enter into constructive dialogue on the challenges and the opportunities that education face in the coming years, that will result in economic growth, prosperity and a better quality of life for all the people living on the islands of Malta and Gozo. Strategies for education reform need to be flexible, ongoing, inclusive and embrace a long-term and sustainable vision that is democratic nationwide.



**Hon. Minister Evarist Bartolo MP**  
Minister for Education and Employment

Educators and education systems worldwide are reassessing the knowledge, skills, and dispositions students need for success in today's rapidly changing and complex world. In a remarkable moment of global consensus, the United Nations, through its adoption of the Sustainable Development Goals prioritized education for global citizenship and global competence and have worked with academics, educators, and stakeholders in the global education field to define global competence in education.

“Research” can bring to mind the type of work academic and research institutions do such as large-scale surveys or highly technical research projects in labs where people in white coats conduct intricate experiments. The goal of such research is to advance and expand human knowledge about the world by answering fundamental questions pertaining to the nature of the universe and societies.

Yet, most research actually happens outside colleges, universities or research labs. Employees and consultants in all industries – whether they are part of the government, non-profit, or private sector routinely engage in inquiries to help solve specific problems. For example, organizational and policy professionals are frequently compelled to answer such questions as: What do users/citizens want from us and what services should we offer or change to better meet their needs? What do we need to do differently to increase our impact? How do we know we are actually making a difference? What options do we have? What shall we prioritize given our limited resources? How did we do on this project or this year, and what can we learn from this experience? Such everyday context to solve specific problems of individuals, organizations, and/or industries is called “applied research.”

The Masters Programmes offered by MCAST are intended to apply knowledge to real world experience and promote research endeavours generating answers to solve specific down-to-earth problems that someone is facing using sound evidence and critical thinking.

The types of basic skills required in working life are changing all the time, which calls for further development and supplementation of existing labour force competencies. The skills to be developed include, cooperation and networking between different professional groups as well as technological competence and problem-solving skills. The keywords here are readiness for changes and continued education.



**Mr. Frederick Schembri**  
President of the Board of Governors

The first MCAST Research Symposium is setting its focus on three main themes - the United Nations Sustainable Development Goals Agenda 2030, the MCAST Masters in Vocational Education and Applied Research 4.0 and the presentation of papers published in the MCAST Journal of Applied Research and Practice.

The architecture of MCAST's strategic Plan 2019 – 2021 launched recently aligns within the framework of the UN Sustainable Development Goals that are constantly being shaped by the rapid developments of artificial intelligence and Industry 4.0. The fourth industrial revolution is bringing a series of social, political, cultural and economic impacts that will unfold over the 21st century. It calls on the education community to be among the key players in developing VET curricula, ensuring that learners will graduate into a world equipped with the right skill set, to shape the world rather than solely address the skills gap challenge.

Underpinning our vision at MCAST is the growing relevance of this institution to cater to the demands of our nation and its impact on society. MCAST programmes are flexible, relevant and responsive to the aspirations of the students and to the needs of industries which are constantly evolving to meet the challenges of a changing global economy. Malta is one of the fastest-growing economies in the European Union through the implementation of a long-term vision geared towards increased foreign and domestic investment, economic growth and increased productivity. Hence it is our responsibility to provide high-quality education that supports employment for all.

The Research Symposium is another opportunity for participants to present what they have learned through their research experiences to a larger audience. The Symposium also provides a setting for students and lecturers to discuss cutting edge research topics and to examine the connection between research, education, and industry. The Symposium includes posters and oral presentations by students from all academic disciplines.

Participating in the Symposium is a great way to learn about the broad range of opportunities available at MCAST and in applying research in social and scientific contexts. MCAST ultimate goal is to provide all students with the competencies required to use research as a means of contributing to the development of our country by providing evidence and new insights into how people can improve their quality of life. Research in a vocational and educational context has the primary aim of impacting positively on people's lives.



**Prof Joachim James Calleja**  
Principal and CEO





# Sustainable Development Goals Agenda 2030

Lead Author: Joseph Falzon

Co-authors and presenters: Stephen Hall / Eleni Tsitsirigou

Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. These goals build on the successes of the Millennium Development Goals, while including new areas such as climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities. The goals are interconnected – often the key to success on one will involve tackling issues more commonly associated with another.



The 2030 Agenda for Sustainable Development is an inter-governmental commitment and “a plan of action for people, planet and prosperity”. It comprises 17 Sustainable Development Goals (SDGs) that are “integrated and indivisible and balance the three dimensions of sustainable development: the economic, social and environmental”; and demonstrate the scale and ambition of the new universal agenda.



They result from what is arguably the most inclusive process of consultation in the history of the United Nations, reflecting substantive input from all sectors of society, all actors of the international community and all parts of the world. All Member States, the entire UN system, experts and a cross-section of civil society, business and, most importantly, millions of people from all corners of the globe, have committed themselves to this comprehensive agenda seeking to address globally-shared concerns and to promote the public good.

mitted themselves to this comprehensive agenda seeking to address globally-shared concerns and to promote the public good.

Five key objectives were set within the United Nations 2030 Agenda for Sustainable Development: (1) People - to end poverty and hunger; (2) Planet - to protect the planet from degradation (3) Prosperity - to ensure that all human beings can enjoy prosperous and fulfilling lives (4) Peace - to foster peaceful, just and inclusive societies and (5) Partnership - to mobilize the means required to implement this Agenda through a revitalised global partnership for sustainable development.

The concern for sustainable development and its three dimensions – economic, social and environmental - is at the heart of the 2030 global development agenda. This globally shared concern for sustainability implies a universal agenda relevant to all societies regardless of income and/or development status. This can be understood as a universality of principles (human rights), universality of reach (focus on equity and inclusion), and universality of country coverage.



Sustainable Development Goal 4 – Education 2030 presents a broad scope ensuring lifelong learning opportunities for all. The objective is to provide equitable opportunities to education in a holistic and lifelong learning perspective. It aims to ensure universal pre-primary and secondary education leading to effective and relevant learning outcomes for all children, youth and adults as a foundation for lifelong and life-wide learning. In addition, SDG4 also aims to ensure equal opportunity in access to further learning opportunities for youth and adults throughout life.

SDG4-Education 2030 includes a renewed and broader focus on inclusion, equity and gender equality. This aims to eliminate gender disparities and ensure more equitable access to all levels of education and vocational training for vulnerable populations including persons with disabilities and indigenous peoples.



Effective learning and the acquisition of relevant knowledge, skills and competencies are supported by the same agenda. This is evident in the targets and global indicators for pre-primary, primary and secondary education, as well as for youth and adult literacy. What's new in fourth sustainable development goals is the relevance of learning, both in terms of vocational and technical skills for decent work, as well as for

‘global citizenship’ in a plural, interdependent, and interconnected world.

The private sector, in this context, is an indispensable partner and has a critical role to play in advancing the global development agenda. In developing countries, private sector operations constitute, in average, 60 percent of GDP, while generating 90 percent of jobs and 80 percent of capital inflows (OECD).

The private sector further contributes to development by providing goods and services, financing social and economic investments through taxes, and creating innovative solutions to help tackle development challenges. Innovation in the private sector across the world is a prerequisite for achieving the 169 ambitious targets, which collectively make up the 17 SDGs.

## SUSTAINABLE DEVELOPMENT GOALS



Each of the targets presents a brief statement of the main policy commitments as derived from the Framework for Action.

It is important to recognize that the private sector is extremely diverse and not defined only by multinational corporations and industry giants. Unleashing the transformative capacity of the private sector for development is not possible without small and medium sized enterprises (SMEs) and social enterprises. For example, SMEs create over 50 percent of formal jobs globally and many innovation leaps have happened in SMEs as well as start-ups.

Knowledge is a catalyst – an indispensable ingredient in all human progress and development. Despite this, it is argued that knowledge is missing from Agenda 2030 and the Sustainable Development Goals. But recent developments seem to indicate that the UN, civil society and others are finding ways of putting knowledge back into the mix.

This increasing attention to knowledge and knowledge management from the international community is a positive trend – and may lead to the more effective implementation of Agenda 2030 and the SDGs. However, going forward, this attention needs to become more structurally embedded in development policies and practices. It also needs to be underpinned by new research on the potential contribution of local knowledge to specific SDGs.

The role of the private sector in knowledge brokering for international development presents challenges for researchers. Achieving the SDGs requires the partnership of governments, private sector, civil society and citizens alike to make sure we leave a better planet for future generations.

*MCAST's collective research potential is called upon to contribute towards SDG4.*

### Joseph Falzon

Architect in private practice, senior lecturer and researcher in policy development and applied innovative strategies for the built environment and Industry 4.0. Programme coordinator for Master of Science in High Performance Buildings at the MCAST Applied Research and Innovation Centre. Following Bachelor's degree from the University of Malta and doctoral degree in Built Environment Specialisms, Bolton Manchester University he pursued research with the U.S. Green Building Council and U.S. Green Building Institute. He holds professional accreditation in Leadership in Energy and Environmental Design [LEED AP]. He is a board member of the International round table 'Europe Chapter' of the International Academy for Design and Health. In addition to academic contributions and participation in conferences he is co-author of several resolutions, recommendations and author of reports for the Council of Europe in collaboration with the Organisation for Economic Cooperation and Development [OECD] UNESCO and Europa Nostra.



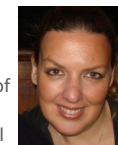
### Stephen J. Hall

Stephen is senior Lecturer in Information Systems Management with specializations in Knowledge Management and Advanced Network Security. His pedagogical interests include Network Protocol Design and Robotics Engineering and is currently managing MCAST's new MSc programme in IT Systems. His previous academic posts include lecturing undergraduate and postgraduate modules in Robotics Systems, Network Performance Protocols, Data Comms and Security Mechanisms. Stephen is also a seasoned IT consultant with extensive industry experience. He was conferred a BSc Honours in Computing & IS in 2005, awarded a scholarship and conferred MSc in Business IS Management in 2013 and most recently awarded a Post Graduate in Higher Education. His research interests lie within the field of Corporate Knowledge Management where he has publications in IEEE conference proceedings and is currently reading a PhD in the field.



### Eleni Tsitsirigou

Eleni is a Strategic Marketing specialist focusing on Cross Cultural Marketing and Tourism trends and planning. She joined MCAST in March 2018, and is the Programme Coordinator for the Masters in Lean Enterprise. Eleni has 19 years of experience in academia. Worked for a number of Universities in the UK and Greece like Hertfordshire University, Middlesex University, University of Wales and Coventry University as a full time lecturer and program coordinator. She has many years of know-how in Universities Collaborations, implementation of brand new programs as well as, programs validations. Eleni holds a BA(HONS) in Business Administration from Staffordshire University (UK), a Master's in Marketing Management from University of Middlesex (UK), a Master's in Business Research Methods from University of Middlesex (UK). Her PhD is focusing on creation of a strategic Tourism Model in the Mediterranean Region.



## Masters in Vocational Education Applied Research 4.0

### Moving from Theory to practice.

Inclusion – Excellence - Equity are the three pillars that hold together the newly launched Strategic Plan for MCAST for the next 3 years. Of course the micro cannot be separated from the macro and for the strategic plan to be effectively implemented we need to unpack the three very loaded terms in the light of the 4th industrial revolution, which will bring rapid and drastic changes that will affect the way we operate, the loss of jobs and the creation of new ones, and life in general.

This cannot be achieved unless we as educators, reinvent ourselves and go through a culture change. A systematic research approach embedded in the masters helps to build ways of inquiring into the everyday teaching and learning practices. The aim is to ensure that engagement with literature and the everyday practices, processes and action research will lead to the creation of new knowledge in context. This will hopefully impact policy development and implementation.

The MVEAR 4.0 has a fundamental objective to change the culture of participants to one of proactivity. It is hoped that through action research the practitioners come to recognise the key role they can have in the transformation of their own practices, the institution, the life of students, the workforce and society in general.

Does all this happen by default upon recruitment? Of course not! Reaching a stage of proactivity can mean a recognition that change can be very hard unless we, as educators, take a conscious decision to do something about it. An deep, self-reflection is necessary to understand how we perceive the College; how we position ourselves in terms of the College; what we expect or expected to find at the College; whether our expectations are being met; whether we feel connected to the College; and how committed we are, if at all, to promote the College.

As educators we can choose to live our experience by design or by default but, of course, the latter is far less empowering than the former.

### Nadia Maria Vassallo

Dr Nadia Maria Vassallo graduated as a teacher in 2001, has taught across all levels and areas of Compulsory and Post-Secondary education. Dr Vassallo continued her Post-graduate studies and specialised in the area of Family Literacy with the University of Sheffield and dyslexia specialist tuition with the University of York at Masters level. Nadia has been working within different roles in a VET setting since 2010. Within her current remit, Dr Vassallo is leading the Curriculum Department including the Key Skills, the Learning Support and Inclusive Education Departments of the College, the QA Department, the Department of Student Outreach and Integration, the Student support services, and the Department of apprenticeship and Work Based Learning. Dr Vassallo is also a leading the Centre for Professional Development which offers continuous professional development for staff including the Masters in Vocational Education Applied Research 4.0.



## Qualitative or Quantitative?

### Which one will set you up to fail?

Dr Ing Alex Rizzo and Dr Ronald Aquilina

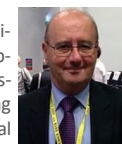
Panel Moderator: Stephen J. Hall

There's no such thing as the 'right' or 'wrong' research methodology for your thesis study, or is there? It's another one of those 'grey area' dilemma's which challenges us as we pursue our academic progression. An understanding of established research methodologies will undoubtedly contribute toward selecting what one would consider to be the more appropriate methodology for one's study but that's not to say that it's the only one! As moderator for this debate and a student of MCAST's Research Methods programme, I can tell you there's a lot more contrast to this dilemma than the spelling of these two words would have you believe. To advocate the differences between these two approaches, our debating panel will be Dr. Ing. Alex Rizzo for Quantitative and Dr. Ronald Aquilina for Qualitative methods.

Dr. Ing. Alex Rizzo's main expertise are in vocational education & training (VET), grounded theory research on organizational behaviour, and integrated water resources management. Alex presently acts as Deputy Principal for R&I, and was previously Head of the University College, at the Malta College of Arts, Science and Technology (MCAST). Prior to this he had set up and managed the MCAST Institute of Applied Sciences. Alex's previous engagements have included that of Deputy Chairman at the Malta Water Services Corporation (WSC), and he has taken on various engineering and management roles within the water sector 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 organizational behaviour. Alex is a Fellow and Chartered Member of the Institution of Engineering & Technology, the Chartered Management Institute and the Chartered Institution for Water and Environmental Management.



Dr. Ronald Aquilina is administering Masters Degree Programmes at Malta College of Arts, Science and Technology (MCAST). At MCAST, he is also lecturing in "Applied Research & Development", "Business & ICT Alignment" and Research Methods. He is also supervising for their Master's thesis. He was also a senior lecturer at St Martin's Institute of Higher Education, lecturing Information Systems and Management to St.Martin's undergraduates. He was also Vice-Principal of the same Institute between 2007 and 2011. Dr. Aquilina graduated in Economics with Honours from the University of Malta. He furthered his studies by reading for a Master's Degree in Business Administration (MBA) from the same University. He completed his formal education at the Robert Gordon University (RGU), Aberdeen. At RGU, he successfully completed the postgraduate certificate programme in Research Methods with distinction and earned his Doctorate by doing original research on IT strategizing in small firms. He also attained the Postgraduate Certificate in Higher education (PGCHE) at Saint Martin's Institute of Higher Education. He has participated in international conferences by presenting papers on Information Systems Management. He is also currently engaged as a Peer Reviewer of Higher Educational Institutions with the National Commission of Further and Higher Education in Malta. Dr. Aquilina was Atlas Technology Group' Support Manager. He also was Information Technology Manager at Marsovin Group and Systems Manager at Dowty (Malta) Limited.





**Doreen Susanne Micallef** graduated Bachelor of Science from the University of Malta in 1992, graduated Masters of Science in Weight Management from University of Chester, UK in 2017 and most recently Post-Graduate Certificate in Research from MCAST. She currently holds the post of Deputy Director at MCAST's Institute for Applied Sciences.

### Physiological and Therapeutic Outcomes of Intermittent Fasting versus Calorie-Restriction Diet in Patients suffering from Metabolic Syndrome

**Abstract:** The main objective of this study was to determine whether an intermittent fasting diet in combination with a CR diet results in better outcomes on risk factors associated with metabolic syndrome (such as lowering of triglycerides, fasting blood glucose, and blood pressure decrease in abdominal obesity and an increase in HDL-cholesterol and related weight loss for both male and female patients) than with a conventional CR diet alone. A 12-week retrospective case-control study was carried out and involved 78 females and 22 males who exhibited or were receiving medications for three or more conditions related to metabolic syndrome and who completed the study out of 120 participants at baseline. These were randomly assigned to either a conventional calorie-restriction diet or to an intermittent-fasting diet. Relevant baseline parameters were measured during the first encounter and were then repeated after twelve weeks. Professional contact was maintained on a fortnightly basis for both groups.

Subjects randomly assigned to the intermittent fasting diet lost more weight than subjects on a conventional calorie-restriction diet after 12 weeks (mean  $\pm$  SD,  $5.7 \pm 3.2$  kg vs  $11.4 \pm 6.4$  kg;  $p < 0.001$ ). There were also statistically significant decreases in waist circumference ( $10.1 \pm 7.2$  cm vs  $4.5 \pm 3.3$  cm;  $p < 0.001$ ), serum triglycerides ( $0.31 \pm 0.29$  mmol/l vs  $0.16 \pm 0.16$  mmol/l;  $p = 0.002$ ), and systolic blood pressure ( $11.1 \pm 8.2$  mm Hg vs  $5.2 \pm 4.8$  mm Hg;  $p < 0.001$ ) and an increase in HDL-cholesterol ( $0.25 \pm 0.16$  vs  $0.14 \pm 0.15$  mmol/l;  $p = 0.001$ ). However, no statistically significant changes in diastolic blood pressure and fasting blood glucose were recorded. The intermittent fasting diet gave better weight loss outcomes (6.67% vs 12.35%) than did the conventional calorie restriction diet when compared to the baseline weight after the conclusion of the 12-week programme. The intermittent fasting diet was also associated with statistically significant improvements in four out of the six parameters measured and associated with metabolic syndrome. Longer-term studies are required to determine whether these outcomes will be maintained over longer periods of time assuming that there is compliance by the participants.



**Theresa Demanuele Montebello** graduated Bachelor of Commerce from University of Malta in 1992 and later specialised in Accountancy. She obtained her Post-Graduate Certificate in Education from the University of Malta in 2001 and most recently obtained a Post-Graduate Certificate in Research from MCAST. She is now following the Masters in Research programme and currently holds the post of Senior Lecturer at MCAST's Institute of Business Management & Commerce.

### Alleviating Poverty in Malta: Changing Minds through Education

**Abstract:** Education plays an important role in minimizing the risk of a person falling into poverty. Studies have shown that persons who pursue an education to post-secondary and tertiary level are considered to be less at risk of poverty.

Studies also show that the impact of education and the risk of poverty may also be generational. Individuals born in families with a lower educational level are more likely to be at risk of poverty. Research has shown that children who experience poverty very early in life may tend to have issues with achieving a complete education. This may have a ripple effect since education affects employability; that, in turn, plays an important role to address the importance of improving the financial capability of the individual and his family.

This research aims to indicate strategies that may be drawn up in order to address the important role of education in eradicating poverty. A holistic approach which offers the right content, structure, and facilities is important in order to guarantee a sound basis on which more educational building blocks may be built by the individual during the educational path that the person decides to follow. Changing minds of professionals involved in planning and devising educational reforms and strategies, together with providing the most adequate support for inclusive education, key skills tutoring, and mentoring, will ensure more success stories.

All these strategies will concurrently help in different ways to address the issue of financial capability of an individual and his family, and thus alleviate poverty.



**Daniel-Louis Tabone** holds a Bsc (Hons.) in Financial Services Management from University College at MCAST and currently works for a public authority within the financial services industry in Malta. His main area of interest is Labour Economics and hence, he focused his undergraduate dissertation on the impact of international labour migration on the macroeconomic factors shaping the Maltese economy.



**Luke Vella** is an assistant lecturer in the Institute of Business, Management & Commerce. Luke joined MCAST in September 2016 and lectures in the Financial Services Degree. He has gained his Honours Degree in Economics from the University of Malta. Luke is in the final stages of obtaining his MSC in Economics from the University of Malta. Luke's research interests are in the areas of financial market anomalies, applied financial econometrics, finance and emerging market.

### Labour Migration into Malta and the Effect on the Maltese Economy

**Abstract:** Labour migration is a significant and yet still uncharted phenomenon in the context of the Maltese islands. This paper will examine the extent of the existence of the relationship between foreign workers and a set of macro-economic variables. Based on secondary data, time series data covering a 12-year period from 2006 to 2017 are used to establish and quantify the impact of inward labour migration onto the macroeconomic variables that make up the Maltese economy. These are tourism, minimum wage, gross domestic product, government expenditure, government revenue, the number of yearly crimes, total population, air pollution, unemployment rate, inflation, property prices, and inward foreign direct investment.

The Pearson Correlation Coefficient is utilized to determine the association between the independent and the dependent variables and Simple Linear Regression to statistically estimate and quantify the correlation between the dependent and each independent variable. Results show that 11 out of the 12 macroeconomic variables have a statistically significant correlation with the increase of foreign workers as operationalized through the population of foreign workers. While the most statistically significant relationship was observed between foreign workers and the population, the least statistically significant relationship was observed between foreign workers and government revenue.



**Christian Camilleri** graduated B. Eng. (Hons) in mechanical engineering from the University of Malta where he finalized his undergraduate study with thesis focused on additive manufacturing of biomedical parts and furthered his studies in micro manufacturing at postgraduate level. He currently holds the post of Project & Research Engineer with the Research & Innovation office at MCAST.



**Luke Pace** graduated with Honours in Mechanical Engineering from University of Malta in 2013 and a Master of Science in Engineering (Mechanical) following research at the Department of Industrial and Manufacturing Engineering at the University of Malta, Institut de Chimie de Clermont-Ferrand of the Ecole Nationale Supérieure de Chimie de Clermont-Ferrand.



**Alex Rizzo** is presently heads a number of research and skilling projects relating to the efficient use of water, as well as in grounded theory research on organizational behaviour. Alex is a Fellow and Chartered Member of the Institution of Engineering & Technology, the Chartered Management Institute and the Chartered Institution for Water and Environmental Management. Alex presently acts as Deputy Principal for R&I, and was previously Head of the University College, at MCAST.

### Performance Analysis of Ageing Domestic Water Meters with Respect to Apparent Losses: A Case Study

**Abstract:** In water distribution networks, a substantial amount of Apparent Losses result from water-meter errors. This study aims to evaluate water-meter under-registration, specifically the effect of ageing on the meter measurement errors, controlled at different flow-rates. The study was initiated by establishing a holistic methodology highlighting the planning process and meter-testing procedure. The results achieved show that the metrological percentage meter error is highly pronounced at low flow-rates. In the case of medium to high flow-rates for one-year, three-year, and five-year-old class of meters, meter errors were not statistically significant. However, an opposite outcome for the same flow-rates resulted for the seven-year class meter.



**Rosienne C Farrugia** is currently resident lecturer within the Faculty of Education at University of Malta and is also a member of the MCAST Research Journal editorial board. Her career began as a primary school teacher, a lecturing position at MCAST in 2012 and a managerial role in 2016. Her main research areas are giftedness and high ability, innovative pedagogies as well as teacher education.

### Vocational Pedagogies for the Formation and Training of Early Childhood Educators: Perspectives of VET Lecturers and Level 5 Early Years Learners

**Abstract:** This paper examines the kind of pedagogical approaches used in Higher Vocational Education, more specifically initial training programmes for early-years practitioners, from the perspectives of both VET lecturers and students currently involved or enrolled in these programmes. The focus is on understanding the ways in which the pedagogical models and tools adopted carefully match the requirements for the successful formation of early-years professionals. More specifically, this paper seeks to explore and understand the factors that influence the vocational pedagogical strategies used, the extent to which these pedagogies are learner-centred, the opportunities and challenges that Higher VET lecturers experience in their classrooms when embracing pedagogical innovation, the benefits for learners, as well as the impact on the quality of the training provided. Adopting a grounded theory methodology, with the aim of building theoretical ideas grounded in the data, two main data collection methods were used: one-to-one semi-structured interviews with a group of VET lecturers and a focus group with a group of Level 5 early-years learners who at the time of the study were in the process of completing the two-year higher diploma. Through a process involving inductive-abductive logic and the constant comparison, coding, and analysis of the data, a theoretical model of vocational pedagogies for the training and formation of early childhood educators emerged. The findings indicate the need for clear pedagogical direction and informed choices to be made individually and collectively by the team of lecturers teaching the programme; this requires the presence of an ethos and climate of critical reflective practice and life-long learning through the creation or seeking of opportunities for continuous professional development. Its relevance becomes more pronounced in the context of a training programme that prepares future educators as there is a greater application of the pedagogy used at higher vocational training level for its transfer to early-years classrooms and settings. The role of the VET lecturer as a role model is highlighted as being significant in the formation and training of early childhood educators by both sets of participants.



**Robert Vassallo** received the B.Sc. degree (with Honors) in Chemistry & Biology from the University of Malta in 2011 and, in 2017 an M.Sc. in Horticulture Sciences (biochemistry) from the Technical University of Munich. He joined the Agriculture Directorate, Malta in 2018 where he is currently working in the policy and regulatory framework of the agriculture sector .



**Marco Dimech** read for an undergraduate degree in Plant Production Technologies at the University of Bologna and subsequently obtained a Masters degree in International Horticultural Sciences from the University of Bologna in collaboration with the Humboldt University of Berlin. He currently holds the post of Assistant Director at the Directorate for Agriculture.

### Irrigation-Water Demand in the Maltese Islands – A Comparative Study between CROPWAT Analysis & In-Situ Monitoring for Ten Crops

**Abstract:** In Malta, freshwater resources are scarce and their availability and accessibility are likely to be further exacerbated as a result of changing climatic patterns and increased urbanization. The agriculture sector, namely the consequence of irrigation demand, is heavily dependent on freshwater, making use of private boreholes to extract freshwater from underground aquifers. Numerous studies and reports have attempted to quantify and estimate the water use by agriculture. However, there exists a great deal of variability in the reported estimates as well in the models themselves. This paper presents an up-to-date compilation of the current irrigation use models and datasets for the Maltese islands and provides a critical assessment of the main principles behind the methodologies used. In order to understand better the adequacy and suitability of current estimates, a series of field studies were carried out to monitor the irrigation use in ten horticulture crops and compared against evapotranspiration and irrigation demand modelling using CROPWAT analysis. Field studies have indicated that irrigation was applied with care and overall resulted in lower water consumption (44%) when compared to model-generated estimations. Our study indicates that water consumption for crop production on a national scale is significantly lower than previously reported estimates. For the first time, irrigation demand figures have been compiled on a crop-by-crop basis, based on both field data and CROPWAT estimates. This study leads the way for the inclusion of crop-specific parameterisation which can be implemented into future water demand models, thus minimizing the risk of parameter errors and uncertainty for national water-use estimations.



**Colette Farrugia** is a graduate of the University of Malta, acquiring a B.Sc. (Hons) in Mathematics and Statistics and Operations Research in 2011 and a PGCE with Mathematics in 2012. She has been working at MCAST within the Learning Support Unit since 2012. She has lectured Mathematics at various levels at MCAST in different institutes. Ms Farrugia obtained the PGCert in Research Methods from MCAST in 2018 and is currently doing a Masters in Research Methods.

### A Study of the Factors that Lead to Student Drop-Out: The VET Context

**Abstract:** This paper aims to investigate different factors which ultimately lead a student in a VET (Vocational, Education, and Training) context to consider dropping out of the course of study. This study was carried out within the Malta College of Art, Science, and Technology (MCAST) as it is Malta's leading VET institution. In order to address the major problem of school drop-outs, one has to understand why students consider dropping out of college. Identifying the reasons that lead to dropping out is extremely difficult because of the range of factors related to the individual student, the family, the community setting in which the student lives, and the school.

The purpose of this study is to explore reasons leading students to consider dropping out in a VET context. It seeks to analyse any relationship between different factors in the life of a student and whether these factors lead a student to consider dropping out of a course of study. The school drop-out rate is an important indicator in assessing the performance of the education system, by level of education. From another perspective analysis, it signals some aspects of social and economic life which can influence people's access to education' (Blandul and Abela 2015). Dropping out of school is the ultimate phase in a dynamic and cumulative process of disengagement (Newmann et al. 1992). The main objective of this research is to understand the main factors leading a student to consider dropping out of college in a VET context. It will also investigate what measures can be taken and what can be done within the college to minimize the drop-out rate. The independent variables in this study are the factors which previous studies have shown that they influence the drop-out rate. The dependent variable is the drop-out rate of students at MCAST. This analysis will study the existence of a relationship between these independent variables and the dependent variable.



**Jesmond Agius** graduated BSc (Hons) in Maths and Physics from the University of Malta in 2002 and is now furthering his studies in Research Methods at Masters level. He is currently lecturer and is appointed Mathematics key skills coordinator and Institute Vocational Coordinator. He is currently researching the phenomenon of global warming in a broader aspect specifically reducing the household carbon footprint to a net zero carbon emission.

### Students' Perception of Global Warming on the Maltese Islands

**Abstract:** In Malta, global warming (GW) can be perceived negatively or positively: negatively due to the effects caused by the rise in temperature, desertification effects, rise in illnesses, and others and positively due to the fact that people might invest in GW mitigation solutions, such as the selling of solar water panels and solar water heaters, developing new ways to mitigate GW, devising plans how to live comfortably even under a rise in temperatures, such as reaching a net carbon zero emission from households, and others.

This paper focuses on how the students at MCAST perceive GW in three different concepts, namely, meanings and related concepts, causes and effect of GW, and actions that can be taken to mitigate GW. The research aims to verify by means of enquiring data, through a closed questionnaire with a set of Likert-scale variables (dependent and independent) using a quantitative approach, to find out if there is a correlation between knowledge gathered through the course of study and the contribution that the students can input in mitigating GW effects. The analysis showed that it is possible to represent all variables by  $\pm$ ve factors and, by using regression analysis, it was possible to test the hypothesis. Results show that there is a strong correlation between knowledge gathered through the course of study and contributing to mitigate GW.

The knowledge contribution was mainly characterized by a strong belief that actions towards mitigating GW exists, and can be studied and implemented. Government initiatives and decisions taken towards mitigating GW contribute slightly to this correlation. The relationship is 100% there since the chance that this answer happened by chance is practically zero. All of this indicates that the studies being carried at MCAST are reflecting in the students' attitude towards greener initiatives.



**Kirsty Farrugia** graduated B.A (Hons) in Health and Social Care Management in 2018. One of her research interests is same-sex intimate partner violence, in fact her undergrad research focuses on SSIPV and service provision. Kirsty is currently in her first year in M.A in Gender, Society & Culture. She is one of the founding members of GSAM (Gay-Straight Alliance MCAST) and currently holds the role of administrator within the Malta LGBTIQ Rights Movement.



**Beverly Abela Gatt** graduated Bachelor of Arts (Hons) in Social Work Hons in 2004, and completed her Masters in Human Rights and Democratization in 2005 from University of Malta. Beverly worked as a social worker at Appogg and now delivers lectures in Health and Social Care at MCAST. As an activist for MGRM, she co-founded Rainbow Support Services and is a social worker and trainer. Her research interests are: gender, same-sex intimate partner violence and LGBTIQ issues.

### The Broken Rainbow: Same-Sex Intimate Partner Violence

**Abstract:** This paper focuses on same-sex intimate partner violence (SSIPV), the effects on the victim within a same-sex relationship, the services available locally for LGB victims, and the barriers encountered by the victims within the services. It explores whether the services offering aid to lesbian, gay, and bisexual (LGB) victims of same-sex intimate partner relationships are effective, since locally there is not a service that offers specific SSIPV support yet. It inquires if the services are gay-affirmative by implementing gay-affirmative strategies, policies, and procedures. It aims to create awareness that same-sex intimate partner violence takes place so as to break the silence in relation to this matter locally. The paper also outlines the importance of having both LGBTIQ services and DV services for the victims to turn to, services they feel comfortable with and can disclose to.



**Josette Bonnici** has been a Health and Safety Lecturer at the Institute of Community Services MCAST for the last 12 years. Her current research project includes the perspectives of students on how they perceive emotional intelligence within the institute with the chance of extending further this study across the Institute within MCAST.



**Ronald Aquilina** graduated BA Economics with Honours from the University of Malta. He furthered his studies by reading for a Master's Degree in Business Administration (MBA) and completed his formal education at the Robert Gordon University (RGU), Aberdeen where he earned his Doctorate by conducting original research on IT strategizing in small firms. He currently administers the Masters programmes at MCAST and serves as a Peer Reviewer of Higher Educational Institutions with the NCFHE.

### The Impact of Lecturers' Emotional Intelligence on Students

**Abstract:** This paper examines how Lecturers' Emotional Intelligence (EI) can have a positive impact on students' lives, both within the classroom and on the place of work. This research uses a grounded theory method as the findings are grounded in the data obtained from the participants. Through in-depth interviews and an interpretivist approach carried out with 4 lecturers working within an Institute at MCAST, the researcher explores and assesses the staff's perception of the importance of EI at the place of work, EI in the role of the lecturer, and EI in building trust between employees and students. It is hoped that the patterns that emerge from this research may be of benefit to both lecturers and students. This study provides a framework where lecturers may manage their students more effectively as disturbing emotions and impulses can be controlled, thus leading to more effective lesson delivery time. Moreover, EI may lead to further motivation to both staff and students. Consequently, more student retention and willingness to learn may lead to self-development and growth into the human beings' personal development.

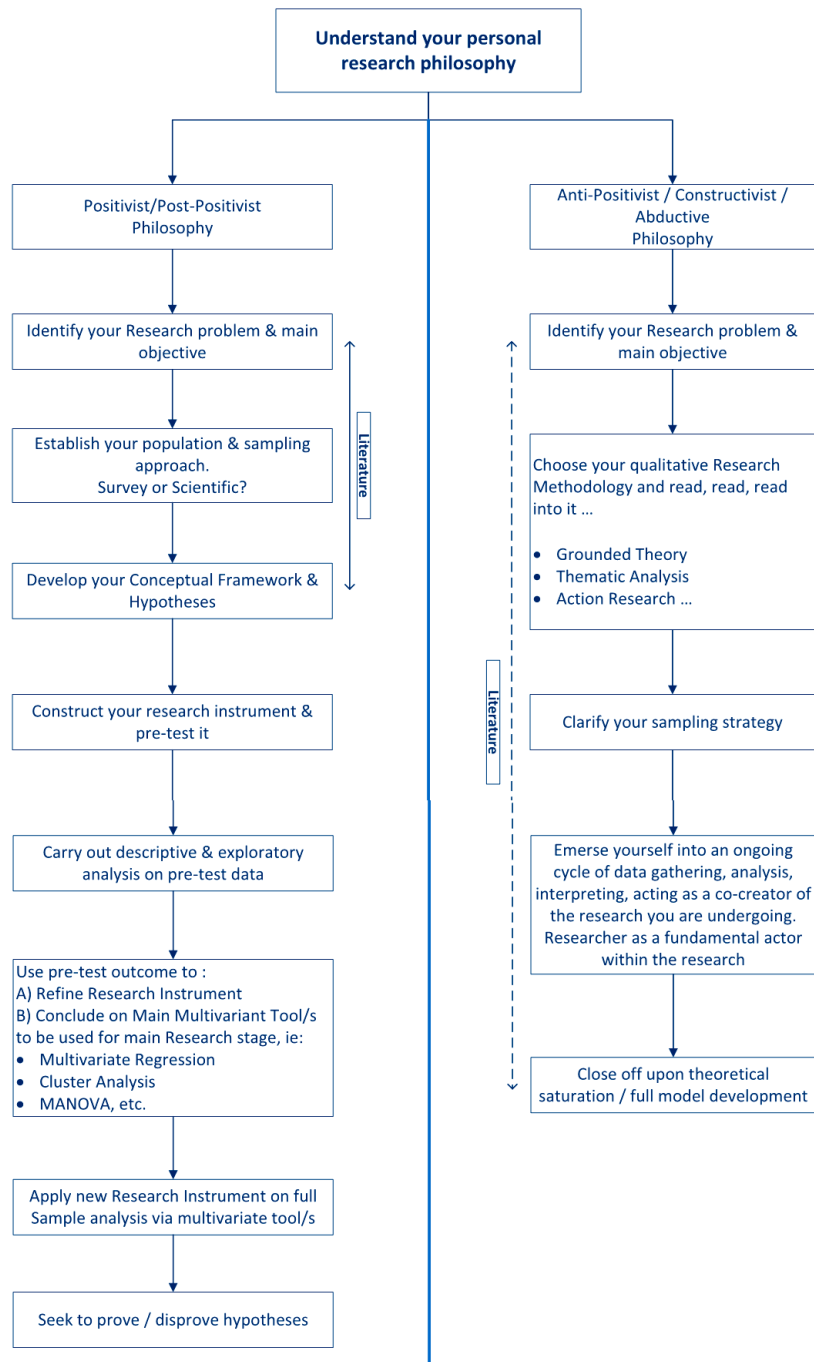


## Poster Presentations

- P01 Joseph Falzon, Stephen Hall, Eleni Tsitsirigou**  
UN Sustainable Development Goals - Agenda 2030
- P02 Rodienne Zammit**  
Predicting Bank Customer Product Using Machine Learning: A Case Study
- P03 Desiree-Marie Dalli Avallone**  
The impact of Information Technology Outsourcing on Small and Medium Firms
- P04 Jeffrey Mercieca**  
Overcoming barriers faced by small businesses in Malta a study with a European perspective
- P05 Karen Hautala-Hili**  
Educators' Perspectives on Teaching Culturally Diverse Students at the MCAST IBMC
- P06 Ing. Karl Camilleri**  
Traffic Congestion in Malta: A Quantitative Analysis of the factors leading to Congestion, attitudes towards Congestion, and acceptable solutions by the Maltese public
- P07 Dorianne Tabone Saliba**  
Achieving Sustainable Development Goals: the Role of the Accountancy Profession in Malta
- P08 Alexander Micallef**  
Decision Taking in the Food Retail area – A Maltese Entrepreneur's Perspective
- P09 Jurgen Borg Cilia**  
Implementation of Cost Planning and Cost Control in the Maltese Construction Industry
- P10 Stephen Gauci**  
Industry expectations from educators in a professional higher education – A STEM Perspective

## Poster Presentations

- P11 Jonathan Vella**  
Nursing education in the 21st century: Preparing nursing students for their clinical placements
- P12 Mireille Treeby Perko**  
The use of technology to enhance Student Engagement and understanding in the classroom
- P13 Andrea Pullicino**  
Examining the range of learning opportunities within Ceramics Education within a VET context.
- P14 Jonathan Micallef**  
Enhancing VET practices adopted in the learning and assessment of Food and Beverage at the Institute of Tourism Studies (Malta) through the deployment of technology.
- P15 Robert Buttigieg**  
The realities of Student Diverse Interactions towards their need for Cognition and Critical Thinking.
- P16 Marina Mizzi Gennadyevna**  
Mobile Information Access in VET classrooms
- P17 Rozita Lautier:**  
Benefits of Diversity In a Vocational classroom from Students Perspective
- P18 Francesca Mizzi Caruana**  
Industry 4.00: Harnessing the Potential of All.  
How are Engineering Students Being Prepared for Industry 4.0?
- P19 Edward Gauci Borda**  
Implementation of Cost Planning and Cost Control in the Maltese Construction Industry
- P20 Matthew Sammut**  
Enhancing VET Practices in the Learning and Assessment of Avionics at MCAST through the Deployment of Technological Solutions
- P21 Darren Mifsud**  
The Benefits of Diversity with regards to Critical Thinking Innovation Employment & Entrepreneurship: A Focus to Diversity Inclusion.



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