2nd SYMPOSIUM ON SUSTAINABILITY IN UNIVERSITY CAMPUSES (SSUC- 2018)

Florence, Italy, 10th-12th December 2018

Abstract Booklet

Edited by

Summary

General information

Venues:

Aula Magna del Rettorato (Main Location) – Piazza San Marco 4

Aula Strozzi (School of Earth Sciences) – Via La Pira, 4

Aula Ostensio Del Giardino dei Semplici (Botanical Garden) – Via Micheli 3

Monday, 10th December 2018

Arrival and set-up of displays (17:00-18:30) – Aula Strozzi

Evening: free

Tuesday 11th December 2018:

8:25-8:55 – Registration and Opening – Aula Magna

8:55-9:10 – Welcome and Introductory notes: Walter Leal and Ugo Bardi

9:10-9:25 – Introductory speech of the President of the University of Florence, Professor Luigi Dei

9:25-9:30 – Welcome: Franco Bagnoli, Delegate of Sustainability of the University of Florence

9:30-10:10 – Key note speech I - "*Integrated sustainability, the experience of the Italian network of Universities for Sustainable Development*" Fabio Pranovi, Università Ca' Foscari, Italy - Network of italian sustainable universities (RUS).

10:10-10:20 – Key note speech II - *"Engaging students at campuses: the experience of the School of Economics and Management in Florence"*, Marco Tortora, University of Florence, Italy

10:20-10:50 – Key note speech III - "*The European School of Sustainability Science and Research"*, Walter Leal, HAW Hamburg, Germany

10:50-11:00 – Discussion

11:00-11:30 – Break

11:30-13:00 – Parallel Sessions: Session 1 (Aula Magna), Session 2 (Aula Strozzi), Session 3 (Aula Ostensio)

13:00-14:00 – Lunch

14:00-15:00 – Plenary Session (Aula Magna)

15:00-15:30 – Coffee Break

15:30-19:00 – Parallel Sessions: Session 4 (Aula Magna), Session 5 (Aula Strozzi), Session 6 (Aula Ostensio)

Wednesday, 12th December 2018:

09:00-11:00 – Plenary Presentations

11:00-11:30 – Break

11:30-13:00 – Parallel Sessions: Session 1 (Aula Magna), Session 2 (Aula Strozzi), Session 3 (Aula Ostensio)

13:00-14:00 – Lunch

14:00-14:30 – Final Session and hand over of best paper awards (Aula Magna)

15:30 – **Optional group tours** – Meeting point: the entrance of the "Rettorato" – where the Aula Magna is (piazza San Marco 1). Transportation to the Florence Waste Management Plant will be provided. The other locations can be reached on foot. Please enlist in advance in the tour you would like to be part of.

Tour 1: The Alia Florence Waste Management Plant (tour guide: Dr. Sara Falsini) Tour 2: The Giardino Dei Semplici Botanical Garden. (tour guide: Dr. Marina Clauser) Tour 3: Florence Downtown Art and History (tour guide, Prof. Ugo Bardi)

Tuesday, 11th December 2018

11:30-13:00 - *Session 1 - Aula Magna*

Implementation and Evaluation of a Didactic Proposal to Mitigate Climate Change in Higher Education

Pedro Vega-Marcote [1], Mercedes Varela-Losada [2]

The environmental crisis, caused by unsustainable development and an unfair model, requires a global change. This crisis is defined by multidimensional problems that are interrelated and not limited by political frontiers such as climate change (CC). Taking the Objetives of Sustainable Development as a reference, a didactic proposal for environmental action was designed and implemented, based on participation, information processing, and the development of critical thinking and decision-making in an autonomous and informed way. The main objective of this study was to design and evaluate an experience for future teachers focused on the study of climate change and the participatory search for local solutions, so that outcomes related to improving their commitment to mitigate CC and the way they see the world could be analysed. The educational experience carried out puts emphasis on the fact that it addresses the necessary teaching skills to face present and future socio-environmental challenges, related to CC. They also seek to improve their knowledge, encourage awareness, and promote sustainable actions with the aim of diminishing the environmental impact in the university campuses.

[1] Faculty of Educational Science, University of A Coruña, Campus Elviña, A Coruña 15071, Spain 0034981167000

[2] Faculty of Educational Science, University of Vigo, Pontevedra 36005, Spain

Pedro Vega-Marcote, Professor of Environmental Education and Sustainable Development and Experimental Science Teaching at the Faculty of Educational Sciences of the University of A Coruña (UDC). He has carried out research in Training of teachers and Sustainability, the Ecological Footprint and reduction of emissions of Greenhouse Gases, Climate Literacy and Innovations in Climate Change Education.

Email contact:

pedro@udc.es

Adapting the Economy for the Common Good for Research Institutions - Case Studies from the IGC Bremen and IASS Potsdam

Sara Franzeck [1], Tim Goydke [2]
David Löw Beer [3], Daniel Oppold [4]

Social and sustainability reporting in universities and research institutes is still in its early stages compared to CSR reporting in corporations. Nevertheless, a growing number of institutions of higher education seek ways to integrate sustainability into their internal processes. The Economy for the Common Good (ECG) balance sheet provides a framework to measure an organizations' contribution to the common good, focussing on dignity, solidarity, sustainability, justice and democracy. This paper presents case studies of the experiences of the International Graduate Center at City University of Applied Sciences Bremen (IGC) and the Institute for Advanced Sustainability Studies (IASS) in Potsdam with adapting the ECG framework for strategic management and as an orientation for teaching. It will discuss the challenges in the development of an ECG-based social and sustainability reporting framework, particularly regarding the adaption of the ECG balance sheet which has been originally designed for corporations. Furthermore, the paper will put the ECG framework in relation to other evaluation methods, and outline the impact it has had on major stakeholder groups like students, faculty, staff, and the way in which organisational change has occurred and led to improved accountability and changes in sustainability performance in an academic setting.

[1,2] International Graduate Center
City University of Applied Sciences
Langemarckstr. 113, 28199 Bremen,
Germany

[3,4] Institute for Advanced Sustainability Studies
Berliner Str. 130
14467 Potsdam, Germany

David Löw Beer works as a research associate in the project Futurisation of Politics. He researches how economic processes and structures should be designed to enable long-term and sustainable decisions and how more public and private investments can be targeted towards social-ecological transformation, looking e.g. at sustainability criteria for pension funds, financial education for sustainable development or the design of a transformative sovereign wealth fund.

He completed his PhD at the universities of Koblenz-Landau, Germany and the University of Vermont, Burlington. David Löw Beer´s PhD focused on teacher education in economics from the perspective of ecological and environmental economics. He has studied international economics and political science in Tubingen, Germany and Niteroi, Brazil.

David Löw Beer worked in a comprehensive school for two years. He has taught and developed teaching materials on numerous aspects of political science and economics such as work, globalization, fair trade, sustainability economics and management, education for sustainable development, gender and diversity.

Daniel Oppold studied Politics and Public Administration (M.A. at University of Konstanz) and Public Management and Governance (B.A. Zeppelin University Friedrichshafen). He is particularly interested in participation-centred theories of democracy and the exploration of dialogue-oriented forms of participation. After his bachelor's studies, Daniel Oppold worked as the Personal Officer of the CEO of social service provider "Die Zieglerschen e.V." in Wilhelmsdorf (Baden-Württemberg), where he was also responsible for tasks in the Organizational Development and Planning Unit.

Daniel Oppold has many years of experience in the field of workshop facilitation. He has been working at the Institute for Advanced Sustainability Studies (IASS) since October 2016 in the research project “Co-Creation and Contemporary Policy Advice”. He is also a member of the Research Management and Organizational Development Unit at the IASS.

Email contacts:

sara.franzeck@hs-bremen.de

tim.goydke@hs-bremen.de

David.LoewBeer@iass-potsdam.de

Daniel.Oppold@iass-potsdam.de

Mind the Gap! Developing the Campus as a Living Lab for Student Experiential Learning in Sustainability

Tela Favaloro [1], Tamara Ball [2], Ronnie D. Lipschutz [3]

This chapter develops a new approach to experiential learning for sustainability and will be of interest to those seeking a baseline for the distinct conceptualizations of experiential learning and their impacts on matriculating (or matriculated) students in the longer term. College campuses are communities unto themselves and, as with communities everywhere, confront the challenges of becoming sustainable. Students attend college to learn and become knowledgeable in their chosen fields, but, perhaps with the exception of research labs, rarely have the opportunity to apply their skills to authentic or "real world" problems—experience that would allow them to become adept at both technical and cognitive process skills needed after graduation. This is especially true for projects focused on sustainability, which require multidisciplinary perspectives and interactions and thus are difficult to launch and complete.

We suggest that the college campus is an ideal "living lab" that not only allows students to encounter and think about complex and wicked issues, but also to define actionable opportunities and address really-existing problems through collaborative projects that materially contribute to the sustainability of a real-world system. Pedagogy supporting "experiential learning" can play a critical role in teaching sustainability concepts and practices and thus in bolstering the Campus as a Living Lab agenda. However, we find competing or ambiguous definitions of experiential learning in the literature and no complete framework for its application in sustainability praxis. This chapter reports on research into sustainability pedagogy and assessment of the educational opportunities in experiential learning at the University of California, Santa Cruz, based on campus efforts to become a more integrated sustainable system. Accordingly, we first unpack terminology applied to "experiential learning in sustainability" from multidisciplinary and multi-departmental perspectives. This review of selected literature combined with data accumulated from students and program facilitators compares and contrasts both the historical significance and current practices of experiential learning to provide a more explicit framework for its implementation in sustainability as part of a coordinated network of distinct living lab entities. We then employ this framework to discuss a "critical gap" in college curriculum that was exposed during our investigation into the efficacy of these projects and programs at UC- Santa Cruz that may be inhibiting student preparation and their ability to contribute to the campus achieving sustainability benchmarks. Finally we propose that this lacuna can be mended by working towards a strategic integration of key experiential learning activities earlier in an undergraduate's career.

Keywords: experiential learning; sustainability; living lab; interdisciplinary; higher education; problem-based learning; project-based learning; hands on

[1,2,3] University of California, Santa Cruz
1156, High Street Santa Cruz, CA 95064, USA

Tela Favaloro, PhD, is Manager of the S-Lab (Sustainability Lab) at UC Santa Cruz. After receiving a Bachelor's of Science in Physics, she directed her efforts into the field of renewable energy focusing on advanced electronic devices for waste heat recovery to receive her PhD in Electrical Engineering at the University of California, Santa Cruz. She emphasizes engineering solutions from a holistic perspective, incorporating analysis of the full technological life cycle and socioeconomic impact in her research and in her development of interdisciplinary, human-centered design curriculum. Dr. Favaloro teaches and mentors projects within the Sustainability Studies minor at Rachel Carson College and in Senior Capstone Design in Electrical Engineering at the Baskin School of Engineering.

Tamara Ball is an Assistant Project Scientist working with the Institute for Scientist and Engineer Educators (ISEE) and uses her doctoral degree in science education to ground ISEE's programs and projects in the learning sciences. She also works part time as an Academic Coordinator for a new Sustainability Studies Minor at Rachel Carson College, UC Santa Cruz which provides experiential learning opportunities for students interested in the nexus of environment & society. Her research and teaching converge on understanding how extracurricular and co-curricular innovations can improve learning outcomes and is largely informed by the principles and perspectives on human development and cognition articulated by Cultural Historical ActivityTheory

Ronnie D. Lipschutz has been Professor of Politics at University of California, Santa Cruz since 1990. He received his Ph.D. in Energy and Resources from UC-Berkeley in 1987 and an SM in Physics from MIT in 1978, worked on Energy and Buildings at Lawrence Berkeley National Lab, and teaches about energy, resources and social sustainability. He is the author/co-author and editor/co-editor of numerous books and articles. With Dr. Doreen Stabinsky, he has recently completed Environmental Politics for Changing World—Power, Perspectives and Practices (Rowman & Littlefield, 2019)

Email contacts:

tela@soe.ucsc.edu

tball@ucsc.edu

rlipsch@ucsc.edu

National Sustainability Transitions and the Role of University Campuses: Ireland as a Case

William Horan [1], Rachel Shawe [2]
Richard Moles [3], Bernadette O'Regan [4]

University Campuses (UC) have the capacity to experiment with and demonstrate innovative sustainability solutions in a 'real-world' context that may serve as possible pre -configurations of sustainable societies. While there is potential for universities to improve their own operational sustainability by experimenting with innovative sustainability solutions on campus, the greatest potential of the sector is their multiplier effect on catalysing wider society's transition towards sustainable communities. To evaluate UC potential contribution towards catalysing wider society's transition towards sustainable communities, no single perspective is adequate due to the multi-dimensional nature of sustainability transition pathways. As a result an integrated approach titled the Higher Education Advancing Development for Sustainability (HEADS) approach was developed and applied to the UC sector in Ireland utilising the perspectives of initiative-based learning (or living lab), sociotechnical analysis and quantitative systems modelling. By utilising this integrated approach, a fuller picture is achieved by bridging the partial understanding obtained from each of these perspectives as to how UC may contribute to national transition toward s sustainability.

Keywords: Sustainability Transitions, University Campus, Living Labs, Sociotechnical Transitions, Integrated Approach.

[1,2,3,4] Department of Chemical Sciences, School of Natural Sciences, Faculty of Science & Engineering, University of Limerick, Limerick, Ireland.

William Horan is a Ph.D. student at the Centre for Environmental Research at the University of Limerick Ireland. He is currently working an Irish Environmental Protection Agency funded project titled 'Developing the Potential of Third Level Institutions as Change Agents in Transitioning towards Sustainable Communities'. This research project aims to identify the most innovative approaches to sustainability in higher education and explore the role of campuses as living laboratories, driving the transition to sustainability both locally and globally.

Rachel Shawe is a sustainable development and earth science enthusiast. She is a driven professional with three years' field experience in Geology, now employed in research. She has recently completed an MSc in Sustainable Resource Management: Policy and Practice. She possesses the ability to manage people; capable of delivering results under pressure and has a flexible approach due to extensive exposure to working in a dynamic, cross-cultural environment. Outside of work and study, she enjoys cycling and being outdoors. If you would like to know more about her, please reach out via email.

Bernadette O Regan, Environmental Scientist, Senior Lecturer in Environmental Science, Centre for Environmental Research, University of Limerick. Lectures in Environmental Management, Material Flow Management, Sustainable Development, Systematic Environmental Science, Environmental Impact Assessment, Conservation Ecology at both undergraduate and postgraduate levels. Research expertise in system dynamics modelling, LCA, sustainability modelling/metrics and environmental/ sustainability indicator development. Project leader for: Sustainable Settlements Research, Waste Management in Healthcare, Material Flow Management and Resource Efficiency, Metabolism and Material Flow Management Project for EU, UL team leader for 2 EU funded projects on waste management and carbon reduction. Supervised 14 PhD Candidates and 3 Research MSc Candidates as well as 6 taught MSc students, mentor for 2 Postdoctoral Researchers and 2 Research Assistants. Grantee EU, EPA, Local Authorities, Department of the Environment, Higher Education Authority, Irish Research Council, Industry.

Email contacts:

William.Horan@ul.ie

researchdevelopment@ul.ie

Tuesday, 11th December 2018

11:30-13:00 - *Session 2 - Aula Strozzi*

Putting Sustainable Campuses into Force: Empowering Students, Staff and Academics by the Self-Efficacy Green Office Model

Maik Adomßent [1], Anselm Grahl [2], Felix Spira [3]

In their joint endeavour, rootAbility and the UNESCO Chair Higher Education for Sustainable Development are advancing sustainability at university campuses. By means of self-efficacy approaches they aim to strengthen the collaboration among all members of higher education communities. The Green Office Model addresses the lack of change structures, which can be seen as an important reason why sustainability is a niche topic in most higher education organisations. This is a problem because universities can leverage their teaching, research and operations to advance solutions to climate change, hunger, sustainable urban development and other Sustainable Development Goals.

The self-enabling Green Office model – co-managed by students and university staff, and supported by the university administration through funds, mandate, and office space – provides inspiration for what a sustainability office on campus can look like.

A Green Office thus represents a change structure in order to support students and university employees across the groups in implementing the idea of sustainability in teaching, research, business and outreach. As a main leverage point, a peer-to-peer digital training program is developed and tested, aiming to provide students, staff and academics with the knowledge and skills to establish more sustainability offices in higher education institutions and improve the work of existing offices.

[1,2,3] UNESCO Chair 'Higher Education for Sustainable Development'
Institute for Environmental and Sustainability Communication - INFU
Leuphana University Lüneburg,
Universitätsallee 1, D-21335 Lüneburg

Maik Adomßent is Senior Research Fellow at the Institute for Environmental and Sustainability Communication/Faculty of Sustainability Sciences, and the UNESCO Chair "Higher Education for Sustainable Development" at the Leuphana University of Lüneburg, Germany. He is also in charge of coordinating Leuphana's Complementary Studies Programme. His activities in teaching and research are centered on (higher) education for sustainable development (HESD), sustainability science and research, inter- and transdisciplinary teaching and learning, and biodiversity.

Currently, he leads the activities for SDG 4 in the actual project of the International Association of Universities' (IAU) thematic Cluster on HESD, and is also engaged in the Global Action Programme (GAP) on Education for Sustainable Development where he works with the Partner Network "Transforming learning and training environments". Recently, he was also Steering Committee member of the project „Broadening the Application of the Sustainability Science Approach" initiated by UNESCO Natural and Social Sciences Sectors together with the Japan Ministry of Education, Culture, Sports, Science and Technology (Japan/MEXT).

Felix Spira, Impact entrepreneur and sustainability activist passionate about empowering change makers to transform their organisations towards sustainability. Professional expertise in organisational change towards sustainability, supporting bottom-up initiatives, and scaling the impact of social innovations.

Email contacts:

adomssent@uni.leuphana.de

felix.spira@rootAbility.com

Green design, Identity or Both? Factors Affecting Environmentally Responsible Behaviors in Student Residences

Martyna Mokrzecka [1], Krzysztof Nowak [2]

Occupant behavior is one of the most important contributors to a building's energy and water consumption. This study investigates the influence of: environmental attitude, identity, and presence of green building features on students' environmentally responsible behavior. Study was conducted at university campus settings. 121 residents of green andconventional student residences have completed a survey, answering the questions about their behaviors, beliefs, and the perception of green features in their residence. Green building features have been divided into two categories: visual and conceptual. The results of statistical analyses have shown that the main determinant of students' behavior is the level of their environmental identity. Students who live in green residences declare lower environmental identity and less pro-environmental behaviors than students in conventional residences. In green residences, environmentally responsible behaviors are more frequent when students are aware of the presence of visual green building features. At the same time, despite declaring less pro-environmental behaviors, students in green dormitories feel they have become more pro-environmental since they moved to green dormitories.Implications of these findings are discussed, in the context of previous studies on architectural and psychological factors affecting environmentally responsible behaviors and in the context of moral licensing.

Keywords: Student residence, green building, environmentally responsible behaviors, pro-environmental identity, moral licensing, pro-environmental architecture

[1] Facultyof Architecture
Wroclaw University of Science and Technology, Prusa 53-55, 50-317 Wroclaw, Poland

[2] Faculty of Management
University of Warsaw, Szturmowa 1/3, 02 -678 Warsaw, Poland

Martyna Mokrzecka has graduated from Poznań University of Technology, Faculty of Architecture, in 2012. After graduation she has started her PhD at Faculty of Architecture, Wrocław University of Science and Technology. She is work in gunder the supervision of professor Zbigniew Bać. Her field of research is pro ecological aspects in design and management of student residences. During her PhD studies she was awarded with Endeavour Research Fellowship and spent five months at Faculty of Architecture, Design and Planning, University of Sydney. She was conducting research on sustainability approaches at four university campuses in Sydney. After coming back from Australia, she received Small Research Grant, financed by Baltic University Programme to conduct research on factors influencing environmental behaviors of students living in student residences.
As an architect she was involved in several projects of refurbishment and redesign of student residences.

Email contacts:

martyna.mokrzecka@pwr.edu.pl

A Review on Integrated Information System and Sustainability Implementation Framework in Higher Education

Mona Al-Kuwari [1], Muammer Koc [2]

Higher Education Institutions (HEIs) hold an essential societal position as a micro model for the larger community of cities, countries, and the World in demonstrating a commitment to, contribution for, and transformational example of sustainability. HEIs have a significant prospect for enabling change towards a sustainable future and development. An extensive number of studies present sustainability ideation and implementation in HEIs with a large variety of approaches along with an emphasis on the main factors affecting its implementation. In addition, other studies report on different strategies used for aligning information systems (IS) with sustainability. This present study is a review aiming at investigating the existing gaps and identifying opportunities for future research towards developing an effective and integrated IS framework to enhance and support sustainability implementation in HEIs. Findings reveal that there is a necessity for further investigation on the linkage between all phases of implementing sustainability in HEIs through integrating sustainability and IS frameworks while considering all main factors that influence this shift.

Keywords: manufacturing technologies; manufacturing system design; material forming plasticity; and the mechanical behavior of materials.

[1,2] Division of Sustainable Development (DSD) Hamad Bin Khalifa University (HBKU), Qatar Foundation (QF), Education City, Doha, Qatar

Mona Al-Kuwari hold a Master degree in computing from the College of Engineering and Bachelor Degree in Statistica from the College of Science both from Qatar University. Her Master's thesis was entitled "The National Students Information System (SIS)" and it examined the impact of the N-SIS on the learning environment in the Qatari schools. She is currently in her second year of her PhD in Sustainability studies at Hamad Bin Khalifa University. In 2014, she joined Qatar Foundation as Program Analyst in QNRF and one of her mani responsibilities is to invest in QNRF data by managing and analyzing research data. Before joining QNRF, she has spent over eight years as a statistician holding the position of Head of Statistical Department, conducting research in Ministry of Education and Higher Education, on education system in Qatar.

Muammer Koç is a founding professor of sustainability at HBKU in 2014. Before, he held professor, director, chair and dean positions at different universities in Turkey and the USA between 2000-2014. He has a Ph.D. degree in Industrial and Systems Engineering from the Ohio State University (1999) and an Executive MBA degree from the University of Sheffield, UK (2014). He has published 130+ publications in various international journals and conferences; edited three books; organized, chaired, and co-chaired various international conferences, workshops and seminars on design, manufacturing and product development. In addition to his academic and educational activities, he provides consulting services to industry, government and educational institutes for strategic transformation, business optimization, organizational efficiency, lean operations, restructuring and reengineering initiatives. He has taught courses across a range of subjects, including product/process/ business innovation and development; medical design and production; energy and efficiency; computer-aided engineering, design and manufacturing; modern manufacturing technologies; manufacturing system design; material forming plasticity; and the mechanical behavior of materials.

Email contacts:

monalkuwari@hbku.edu.qa

mkoc@hbku.edu.qa

Sustainability in Higher Education: The Impact of Transformational Leadership on Followers' Innovative Outcomes
A Framework Proposal

Reem S. Al-Mansoori [1], Muammer Koç [2]

Higher Education Institutes (HEI) initiate, accelerate and facilitate regional and national development through human capital development, knowledge creation, innovation capacity building and technology transfer. As contemporary global challenges are of a mixed and multi-dimensional nature, interdisciplinary education and innovative research are needed more than ever. Thus, leaders of HEI are required to transform their institutions to respond to these challenges and the pressures created by global dynamics. This study is dedicated to designing a framework to enhance the relationship between the leadership styles and their followers' innovative outputs. The suggested framework is based on the model of Kong et al. for leadership implicit follower theory (LIFT) and suggests the transformational leadership (TL) style to initiate the positive LIFT. This methodology proposes a set of indicators to assess innovation outputs quantitatively and intends to use engineering schools of HEIs as a sample to test the framework. It is suggested that this framework can be adjusted to examine different HEIs, colleges and R&D institutes in different contexts and at multiple leadership levels. The main outcome of this study is a framework that can be used to evaluate, assess and train existing or prospective HEI leaders, develop tailored human resources strategies, and design leadership training for students, researchers and young faculty members for their future career development in creative ventures.

Keywords: Leadership, transformational, innovation, sustainability, higher education

[1,2] Division of Sustainable Development Hamad Bin Khalifa University, Education City, Doha, Qatar

Reem S. Al-Mansoori holds a bachelor of science in petroleum engineering from Texas A&M University, Qatar (2008), and masters of sustainability from Monash University, Melbourne, Australia (2015). Currently, she is doing her PhD in the Division of Sustainable Development (DSD) in the College of Science and Engineering at Hamad bin Khalifa University, Qatar. Her research interest is in topics related to leadership, transformational leadership, creativity, innovation, positive psychology, and education for sustainability. For her masters, she developed a workshop for high school students that focuses on stimulating creativity to generate innovative and sustainable solutions for the current environmental challenges. This was part of a granted internship offered by sustainable development solution network (SDSN) youth division, Australia/Pacific region, which is an initiative by the United Nation. Prior to her masters, Reem worked as a reservoir and petroleum engineer in Qatar Petroleum and TOTAL for five years.

Prof. ***Muammer Koc*** is Founding Professor and Coordinator of the Division of Sustainable Development at HBKU / QF. Previously, he held senior scientist, director, professor, chair and dean/director positions at various universities in the US and Turkey. He has a PhD degree in Industrial and Systems Engineering from the Ohio State University (1999) and Executive MBA degree from the University of Sheffield, UK (2014). His research and teaching interests are on sustainability, knowledge-based economy, human and social capital development, organizational and social efficiency, near-zero waste policies and technologies; renewable energy policies and technologies; design innovation and entrepreneurship; design and manufacturing. He has 200+ publications in various international journals and conferences. In addition to his teaching and research activities, he provides consultancy to business, government and educational institutes for strategic transformation, business optimization, restructuring, business reengineering.

Email contacts:

reealmansoori@hbku.edu.qa

mkoc@hbku.edu.qa

Tuesday, 11th December 2018

11:30-13:00 - *Session 3 - Aula Ostensio*

Generating a New Idea of Public Mission for Universities. A Sustainable Communication Paradigm for Community Building

Viola Davini [1], Ilaria Marchionne [2], Eugenio Pandolfini [3]

In the last decades, at international level, universities have been facing an important and essential challenge: to define and promote a "sustainable" communication model able to aggregate different skills and resources - internal and external to the academic field - that effectively respond to the needs of the social and productive fabric.

Starting from this idea, the *Generating a New Idea of Public Mission for Universities research project, conceived and developed by the Center for Generative Communication (CfGC) of the University of Florence, aims to redefine the relationship between Research, Education, Third Mission and Territory.*

The conviction that drives this research work is, in fact, that universities can be characterized as a prototype for any enterprise. Universities, in fact, intervene at the same time on the front of education, research and development and can initiate a significant reflection on the modalities that today distinguish the definition of services, goods and products. These institutions create and disseminate a new model of sustainable communication that identifies the skills and resources necessary to generate truly innovative products, taking into account social and productive fabric needs.

The main purpose of the project, therefore, is precisely to introduce a new vision of Technology Transfer as a means to: identify the needs coming from the society, highlight the critical issues that need to be solved, promote for the skills and human resources (before economic ones) necessary to find innovative solutions for the identified problems.

After an introduction of the topic and an overview of its scientific context, this paper will examine two research experiences (*Good practises of Job Placement and Generative Communication for CsaVRI) developed by the CfGC in the last few years. These research projects focus on the analysis of expressed and unexpressed needs within the Florentine university community: students, recent graduates, doctoral students, grant holders, teachers and, last but not least, the administrative staff.*

Keywords: Public mission, Community building, Generative communication, Sustainability, Innovation development

[1,2,3] Center for Generative Communication, Department of Political and Social Sciences University of Florence, Via Laura 48, 50121, Florence (Italy)

Viola Davini is a PhD student at the University of Florence, Italy. In 2015 she began collaborating with the Center for Generative Communication, a research unit directed by prof. Luca Toschi at the Department of Political and Social Sciences of the University of Florence. Within the CfGC, she carries out research activities related to communication strategies aimed at developing an applied research model to strengthen the relationship between universities and the territory.

Ilaria Marchionne is a PhD student at La Sapienza University of Rome, Italy. In 2015 she began collaborating with the Center for Generative Communication, a research unit directed by prof. Luca Toschi at the Department of Political and Social Sciences of the University of Florence. Inside the CfGC, she carries out research activities related to the conception, design and testing of organizational models that facilitate the definition of interdisciplinary projects through community building actions.

Eugenio Pandolfini obtained a PhD in Advanced Architectural Projects at the Technical School of Architecture in Madrid. In 2014, he began collaborating with the Center for Generative Communication, a research unit directed by prof. Luca Toschi of the Department of Political and Social Sciences of the University of Florence. Inside the CfGC, he carries out research activities on languages and communication strategies in relation to architecture, urban planning and, above all, territory and landscape, intended as complex systems and macro-active socio-economic subjects.

Email contacts:

viola.davini@unifi.it

ilaria.marchionne@unifi.it

eugenio.pandolfini@unifi.it

Creating Collaborative Spaces to Foster Education for Sustainable Development in Multidisciplinary Campus in a Mexican Higher Education Institution

Jairo Agustín Reyes-Plata [1], ***Ilane HernándezMorales*** [2]

Higher Education Institutions, characterized by multidisciplinary environments, offer meaningful opportunities for education and research on sustainable development.

However, the collaborative work to deal with problems on sustainability is not as common as it should. Part of the problem lies in the misunderstanding of the sustainability concept and monodisciplinary approaches. The present study built upon a diagnosis on education for sustainability at undergraduate level at the largest University in Mexico. Particularly, the interest resides on analyzing perceptions of students and academics on the sustainability concept and the interdisciplinary and transdisciplinary practices. The results illustrate two aspects that are fundamental to support education on sustainability, (i) strengthening the conceptual perception, and (ii) stimulating the collaborative interdisciplinary work.

Keywords: Sustainability, Education for Sustainable Development, Interdisciplinary Work, Collaborative Space, Higher Education Institutions.

[1,2] Escuela Nacional de Estudios Superiores, Unidad León Universidad Nacional Autónoma de México Blvd. UNAM 2011, León, Guanajuato, México

In 2015, ***Jairo Agustín Reyes Plata*** joined the ENES-Leon UNAM, where he was appointed Professor-Researcher in the Department of Territorial Studies. There, he is teaching on Environmental and Sustainability in Urban Planning. He received his doctorate in landscape planning from Kyushu University in Japan in 2014. He graduated from UNAM as a Landscape Architect in 2003. His research focuses on the regional planning of green infrastructure.

In 2017, ***Ilane Hernández Morales*** was appointed Professor-Researcher at ENES-Leon UNAM in the Agricultural Business Management Department. There, she is teaching Organic Agriculture and Sustainability for Enterprises. In addition, she is finishing her doctorate studies in Immunology and Microbiology at KU Leuven in Belgium. She has a Master in Science degree in Biotechnology from Wageningen University, The Netherlands. Ilane graduated from UNAM in 2009 as a Doctor in Veterinary Medicine. Currently, her research focuses on developing vaccines and antiviral drugs to treat viral diseases in animals and humans. In addition, she analyses the economic impact of infectious diseases for health systems.

Email contacts:

jreyes@enes.unam.mx

ilane.hernandez@comunidad.unam.mx

How Green Can You Go? Initiatives of Dark Green Universities in the Philippines

Jocelyn C. Cuaresma

A number of Philippine universities have called themselves green schools. Others have gone beyond being green and consider themselves dark green campuses. Sustainability initiatives in campuses called dark green school (DGS) have been around since the 1970s. A DGS is considered both a status and a process of certification or accreditation. As a status, a certified DGS means that the school has met certain standards of quality set by the accrediting agency. As a certification process, it signifies the school's commitment to continuously enhance and sustain one's accomplishments. This paper used the case study method to showcase the policies and practices of selected dark green universities in the Philippines that have met the standards of quality of a DGS. Using a combination of research methods that includes an analysis of documents, ocular visits and interviews, this paper examines the strategies and initiatives of four universities that are accredited- and/or self-assessed DGS and how they operationalized the DGS as a whole-of-school approach. Data gathered illustrate that beyond the integration of the elements of sustainable development, climate change and disaster management into the university vision and mission, curriculum, research and extension services, the selected universities have adopted campus policies and programs on solid waste management, energy, water and paper conservation, water conservation and treatment, anti-pollution and clean transport. More than this, the schools studied have transformed the academic campus into green living spaces, providing the academic community with green gardens, parks, forests, and native tree production. The practices of four case universities towards not only a green-, but a dark green school, show that achieving environmental sustainability requires a whole-of-school approach where students, faculty, administration, and the rest of the academic community cooperate towards achieving sustainability at the university and community levels.

Keywords: dark green campus, universities, environmental education, sustainability

National College of Public Administration and Governance
University of the Philippines, Diliman Campus, Quezon City, Philippines

Jocelyn C. Cuaresma is currently Associate Professor and College Secretary at the National College of Public Administration and Governance (NCPAG), University of the Philippines (UP) Diliman. She earned her Bachelor of Arts in Economics at the University of the Philippines Manila. She earned a Master of Public Administration degree also at UP-NCPAG, and a Master of Administrative Sciences at the German University of Administrative Sciences Speyer in 1988. She finished her Doctor of Public Administration degree also from the UP-NCPAG. She briefly worked in government, particularly at the Office of the President of the Philippines, Malacañang, as Director IV of the Correspondence Office, and Director III of the Administrative Service of the Department of the Interior and Local Government-Central Office.

Her teaching and research interests include public administration theory, PA and economics, public finance, local government financial equalization, privatization, sustainable development, and role of PA in climate change.

Email contacts:

joycepcc@yahoo.com

- **The Maturation Process of Incorporating Sustainability in Universities: Early Experiences in Belgium and Chile.**
  Luis Vargas, Claudia Mac-Lean and Jean Hugé, University of Chile, Chile and Université Libre de Bruxelles, Belgium

Tuesday, 11th December 2018

14:00-15:00 - *Plenary Session - Aula Magna*

Using the Learning in Future Environments (LiFE) Index to Assess James Cook University's Progress in Supporting and Embedding Sustainability

Colin J. Macgregor [1], Adam Connell [2]
Kerryn O'Conor [3], Marenn Sagar [4]

Increasingly, higher education institutions (HEIs) are seeking to assess and report on their sustainability performance. One of the more widely known assessment tools is STARS (Sustainability Tracking, Assessment and Rating System). Developed in 2007, STARS has been criticised because of its pressuring characteristic i.e. it has been designed to support external performance reporting. The LiFE (Learning in Future Environments) index is a non-committal assessment tool that allows HEIs to monitor their progress in supporting and embedding sustainability without the need to reveal their performance externally. LiFE has been adopted by members of the Environmental Association of Universities and Colleges (EAUC) and Australasian Campuses Towards Sustainability (ACTS). This paper presents findings from a study of James Cook University's experiences with LiFE since 2013. Scores suggest JCU has had an inconsistent response to sustainability over the last five years. The paper describes and discusses some of the factors that have influenced JCU's scores and highlights some of the factors that emerged to support or interfere with the University's sustainability aspirations. The paper will be of interest to any HEI using or considering using the LiFE index or anyone who is interested or involved with embedding sustainability in HEIs .

Keywords: Sustainability Assessment, Reporting, Higher Education Institutions, LiFE Index

[1,2,3,4] College of Science and Engineering
James Cook University
PO Box 6811, Cairns, Qld 4870, Australia

Colin Macgregor is a Senior Lecturer in Sustainability within the College of Science and Engineering at JCU. He is also a member of JCU's Sustainability Advisory Committee (SAC) and a member of JCU's Sustainable Development Working Group (SDWG).

Adam Connell is the Manager, Environment within the Estate Directorate at JCU and is also a member of JCU's SAC and SAG.

Kerryn O'Conor is the Sustainability Officer at JCU operating from within the Office of the Chief of Staff.

Marenn Sagar is the Assistant to the Manager, Environment providing supporting JCU in its various sustainability endeavours.

Email contacts:

colin.macgregor@jcu.edu.au

kerryn.oconor@jcu.edu.au

adam.connell@jcu.edu.au

marenn.sagar@jcu.edu.au

How Can Ecological Fairs Increase Sustainability in a University Campus?

Luciana Londero Brandli [1], Amanda Lange Salvia [2], Leila Dal Moro [3], Vanessa Tibola da Rocha [4], Janaina Mazutti [5], Giovana Reginatto [6]

Over the last thirty years, the idea of Sustainable Development, conceived in 1987, has spread globally. The adoption of a sustainable stance has become urgent at local and global level and many institutions are now committed to promoting their development in a sustainable way, including Higher Education Institutions (HEIs). University of Passo Fundo has been promoting several events for local and academic community, and among them, the most outstanding are the ecological fairs. Thus, the aim of this paper is to highlight the contribution of these events to the promotion of sustainability in a university campus, based on a case study carried out at the University of Passo Fundo, located in Southern Brazil. For this, it was analysed how the social, economic and environmental spheres of sustainable development are impacted by ecological fairs. The results showed how fairs positively impact the academic and local community while bringing sustainability into university campuses. This case study demonstrated how the promotion of ecological fairs on a university campus plays an important role in the implementation and practice of sustainability and can serve as an example for other institutions that intend to work with similar projects.

Keywords: Familiar agriculture, Sustainable Practices, University Campuses.

[1,2,3,4,5,6] Graduate Program in Civil and Environment Engineering
University of Passo Fundo, Brazil

Luciana Londero Brandli is graduated in Civil Engineering (1995), master's degree in Civil Engineering (1998) and Ph.D. in Production Engineering (2004). Pos Doctorial Research at Hamburg University of Applied Sciences (2014). She is currently Associate Professor in the University of Passo Fundo, south of Brazil, working in the Master Program in Engineering and Environment. Her current research interests include sustainability in high education and green campus, environment management, management of urban infrastructure, sustainable cities and green buildings.

Amanda Lange Salvia has a degree in Environmental Engineering (2014) and she is currently a doctoral student in Civil and Environmental Engineering at Passo Fundo University, in South of Brazil. She has experience in research since 2011, and current interests include energy efficiency, sustainable cities, environment management and Sustainable Development Goals.

Leila Dal Moro is graduated in Public Management from the Southern University (IMED), master in Engineering, Infrastructure and Environment by the Post-Graduate Program in Civil and Environmental Engineering of the University of Passo Fundo (UPF), where she is currently a student of the doctorate (CAPES). Areas of scientific interest: Sustainable Development Gols; Sustainable Production and Consumption, Sustainable Agriculture.

Vanessa Tibola da Rocha is graduated in Architecture and Urbanism from the University of Passo Fundo (UPF-2013), master's degree in Engineering by the Post-Graduate Program in Civil and Environmental Engineering (concentration area of infrastructure and environment) of the University of Passo Fundo (UPF-2016), where she is a doctoral student (CAPES). It presents scientific experience in the areas of infrastructure, environment, sustainability, urbanism, architecture, urban planning and management.

Mazutti Janaina is a student of the graduation course in Environmental Engineering at Passo Fundo University, in South of Brazil. She is also a scholarship student FAPERGS. Her interests are related to sustainable management projects, sustainable development goals and sustainable and smart cities.

Giovana Reginatto is a student of the graduation course in Civil Engineering at Passo Fundo University, in South of Brazil. She is also a scholarship student Pibic/CNPq. Her interests are related to sustainable management projects, sustainable development goals and energy efficiency.

Email contacts:

brandli@upf.br

amandasalvia@gmail.com

leidalmoro@yahoo.com.br

vanessat.rocha.arq@gmail.com

janainamazutti@gmail.com

gioreginato@gmail.com

Tuesday, 11th December 2018

15:30-17:00 - Parallel Sessions

Session 4, Aula Magna

Bridging the Gap between Theory and Design: a Proposal for Regenerative Campus Development at the Swedish University of Agricultural Sciences (SLU) in Ultuna, Sweden

Daniel Bergquist [1], A. Christine Hempel [2], V. John Lööf Green [3]

Global challenges call for designs that enhance environmental and human resources and their capacity to regenerate over time. Sustainability objectives are particularly crucial when envisioning university campuses; the environment serves as a laboratory for researchers, teachers, students, and residents of the surrounding community. This paper describes an exploratory research and design process that uses illustrative techniques with the aim to bridge the gap between theoretical principles of systems ecology and a workable physical planning strategy for Ultuna Campus in Uppsala, Sweden. A large-scale modern building program is already underway, and rapid urbanization in the surrounding region coupled with projected growth on campus suggests future intensification of university lands. A master plan to be implemented until 2040 is now in the preliminary design phase. Ultuna is home to significant cultural and ecological landscapes, and a holistic approach is called for. Central principles of self-organizing systems are selected and concretized as visionary hypotheses in a physical context. Stakeholder interviews provide the empirical basis for this exploratory design process. Preliminary design concepts and plans illustrate sustainable systems while supporting new functional programmatic requirements: housing, industry-research collaboration, transportation, and community-integrated landscapes. The result is a proposal based on regenerative landscape design, envisioning campus Ultuna as a coherent whole.

Keywords: Campus development, Systems theory, Regenerative design, Place attachment, Illustrations

[1] Division of Landscape Architecture, Department of Urban and Rural Development
Swedish University of Agricultural Sciences. P.O. Box 7012, SE-750 07 Uppsala, Sweden

[2] Design and Planning
Agersnapsvej 3-ST, 7100 Vejle, Denmark

[3] Division of Facility Management
Swedish University of Agricultural Sciences

Daniel Bergquist has a PhD in human geography from Uppsala University. Since 2014 he is a researcher in landscape architecture at the Department of Urban and Rural Development of Swedish University of Agricultural Sciences, SLU. He has a background in interdisciplinary studies in systems ecology and geography. His current research areas are sustainable (urban) development, spatial planning and systems theory.

Christine Hempel is an illustrator and urban designer, and has a PhD in Rural studies from teh University of Guelph, Canada, where she specialised in design for sustainable communities and landscape. She recently relocated to Scandinavia and is establishing a design practice. She uses a combination of illustration techniques and collaborative research to hep communities envision sustainable physical dsign.

John Lööf Green has studied Landscape Architecture at the Swedish University of Agricultural Sciences. Since 2018 he is coordinator of outdoor environment at the Division of Facility Management of the Swedish University of Agricultural Sciences (SLU). He has got a background in horticulture and field biology. Current work includes grounds management, construction and planning mainly at Ultuna Campus as well as other locations where SLU is located in Sweden.

Email contacts:

daniel.bergquist@slu.se

chempel@fastmail.com

ohn.loof.green@slu.se

A pragmatic Framework for Setting Up Transdisciplinary Sustainability Research On-Campus That Can Make a Difference

Griet Ceulemans [1], Nathal Severijns [2]

Higher education student sustainability projects should really deviate from a business-as-usual scenario. They need to question the ecological modernization thought. They should highlight the need for a dramatic paradigm shift specifically towards sufficiency and equity. They ought to make explicit what is required to make such a change.
The course science and sustainability at KU Leuven makes natural science students experience the challenges of setting up transdisciplinary sustainability research that can truly make a difference. Making the campus more sustainable then requires dramatic shifts in trivial routines. One team chose to help reduce the carbon footprint of the university staff and students by setting up some basic conditions for nudging towards a vegan food choice. This paper describes the sustainability framework the students started from and the experience and insight they gained tackling the specific issue. It is relevant to anyone interested in using on-campus project work to provide students with basic insight in how sustainability might really be attained and what minimal transdisciplinary methods are needed.

[1] Department of Chemistry & Specific Teacher Education Centre of the Natural Sciences (option Chemistry), University of [1]Leuven, Celestijnenlaan 200C box 2406,B-3001 Leuven, Belgium

[2] Department of Physics and Astronomy, University of Leuven, Celestijnenlaan 200D box 2418, B-3001 Leuven, Belgium

Griet Ceulemans

- PhD in Pharmaceutical Sciences, 1997
- Postdoctoral fellow at the Scripps Research Institute (California, USA), 1997
  Honorary fellow of the Belgian American Educational Foundation, 1997
- Postdoctoraal Researcher, University of Leuven (Belgium), 1998
- Project manager biosensors, IMEC Microelectronics Research Institute (Leuven, Belgium), 1998-2000
- Lecturer, University of Antwerp (Belgium), Faculty of Pharmaceutical, Biomedical and Veterinary
  Sciences, 2000-2009
- Professor, University of Antwerp (Belgium), Faculty of Pharmaceutical, Biomedical and Veterinary
  Sciences, 2009-2012
- Professor, University of Leuven (Belgium), Faculty of Science, Department of Chemistry – Teacher
  Education Chemistry, 2012 - now

Nathal Severijns

- PhD in Sciences (Physics), 1989
- Postdoctoral Researcher, Université Cath. de Louvain (UCL; Louvain-la-Neuve, Belgium), 1989-1991
- Research Associate, University of Leuven (KU Leuven, Leuven, Belgium), 1991-1993
- Senior Research Associate, University of Leuven (Belgium), 1993-2000
- Professor, University of Leuven (Belgium), 2000 - now

Email contacts:

griet.ceulemans@kuleuven.be

nathal.severijns@kuleuven.be

Biodiversty Conservation in University Campus - a Case Study from South India

B.C.Nagaraja

Biodiversity in urban areas could undergo changes in time due to many factors. Increase in population and urbanization demand on land for infrastructure and industrial development, which diminish the local biodiversity. With this background Bangalore University has developed Biodiversity Park in 323 ha of vacant land of the campus from 1999 to 2003. Sixty years ago, the area was a sandalwood reserve, used as an elephant corridor between two protected forests. The area, not protected under the Forest Act, underwent unchecked degradation until the time that it was handed over to Bangalore University nearly 30 years ago. The University in collaboration with State government constructed of check dams to harvest rain water. Since then, 323 ha has been planted largely consisting of indigenous tree species Western Ghats, which is one of the world biodiversity hotspot of the world, in a bid to enable faunal regeneration, as well as conduct research on a number of trees known to be native to the Western Ghats. The study aims at understanding establishment patterns of native species and their role in carbon sequestration. For this purpose a total of 22 permanent quadrates of 25X25 were established in 2004 covering 323 ha of Biodiversity Park of the campus.

Among the species *Pongamia pinnata, Gmelina arborea and Tectona grandis sequesters highest carbon in the biopark. It was found that Acacia auriculiformis had a great potential to store carbon with 21.32 % and Lagerstroemia lanceolata was the least with 0.11%. The total carbon sequestration of Biopark is 1361.83 t/ha with an average of 68.09 t/ha for each plot. The soil carbon storage for Biopark is 782 t/ha with an average of 39.14 t/ha. The results of this study may facilitate further planning and decision making on increasing green cover and carbon sequestration.*

Department of Environmental Science
Bangalore University
Bangalore – 560056
Karnataka, INDIA

B.C.Nagaraja, Completed Doctoral degree on restoration ecology from Bangalore University in the year 2000 and worked as post doctoral fellow for five years at Center for Ecological Sciences of Indian Institute, Bangalore. Since 2006 working as Assistant Professor in Environmental Science department of Bangalore University. I have been published more than fifty research papers in the field of forest ecology, biodiversity and ecosystem services and presented papers in many international conferences. Since from last two decades actively involved with our University in establishing biodiversity park and undertaken many studies on biodiversity, ecosystem services and climate change issues.

Email contact:

nagenvi@gmail.com

Challenges and Benefits of On-Campus and Off-Campus Sustainability Research Projects as an Approach to Education for Sustainability

Nathal Severijns [1], Griet Ceulemans [2]

The course 'Science and Sustainability' at the University of Leuven is a stand-alone course that aims at providing master students in the natural sciences, education for (the benefit of) sustainability action. It was launched in 2016-2017 and several elements in the setup have been changed to a considerable extent in the second year it is now running.

The first year basic considerations drove the course development: students needed to acquire a similar level of knowledge in sustainability, so course materials and time were allocated to achieve this goal. On a higher level, the experiential learning phase (project work) was supported with specific reflection assignments that were developed at the time of need.

The second year more specific attention was directed towards allowing students to get acquainted with systems thinking, and deal with inter- and transdisciplinary issues by approaching problems from a multi-stakeholder view.

The educational benefits and challenges of introducing natural science students to on -campus and off-campus sustainability research projects as an approach to education for sustainability, are discussed. This is based on a reflective interpretation of the students' self-reported sustainability competence development.

[1] Department of Physics and Astronomy, University of Leuven, Celestijnenlaan 200D box 2418, B-3001 Leuven, Belgium

[2] Department of Chemistry & Specific Teacher Education Centre of the Natural Sciences (option Chemistry), University of Leuven, Celestijnenlaan 200C box 2406,B-3001 Leuven, Belgium

Nathal Severijns

- PhD in Sciences (Physics), 1989
- Postdoctoral Researcher, Université Cath. de Louvain (UCL; Louvain-la-Neuve, Belgium), 1989-1991
- Research Associate, University of Leuven (KU Leuven, Leuven, Belgium), 1991-1993
- Senior Research Associate, University of Leuven (Belgium), 1993-2000
- Professor, University of Leuven (Belgium), 2000 - now

Griet Ceulemans

- PhD in Pharmaceutical Sciences, 1997
- Postdoctoral fellow at the Scripps Research Institute (California, USA), 1997
  Honorary fellow of the Belgian American Educational Foundation, 1997
- Postdoctoraal Researcher, University of Leuven (Belgium), 1998
- Project manager biosensors, IMEC Microelectronics Research Institute (Leuven, Belgium), 1998-2000
- Lecturer, University of Antwerp (Belgium), Faculty of Pharmaceutical, Biomedical and Veterinary
  Sciences, 2000-2009
- Professor, University of Antwerp (Belgium), Faculty of Pharmaceutical, Biomedical and Veterinary
  Sciences, 2009-2012
- Professor, University of Leuven (Belgium), Faculty of Science, Department of Chemistry – Teacher
  Education Chemistry, 2012 - now

Email contacts:

griet.ceulemans@kuleuven.be

nathal.severijns@kuleuven.be

Tuesday, 11th December 2018

15:30-19:00 - Parallel Session

Session 5, Aula Strozzi

Closing Graduates' Sustainability Skills Gaps by Using the University as a Live Sustainability Case Study

Kay Emblen-Perry

Despite the adoption of specialised sustainability programmes and incorporation of some sustainability content into business curricula, Business Education for Sustainability for business management students still fails to meet needs of graduates in the workplace, creating a sustainability skills gap.

In order to address this sustainability skills gap, the Level 5 business sustainability curriculum engages students in practical methodologies for business sustainability learning, teaching and assessment using the university as a live sustainability case study. This introduces students to real-world sustainability challenges and opportunities through a known organisation in the safe environment of the classroom.

This paper presents qualitative evidence from research conducted to investigate the effectiveness of using the university as a live sustainability case study for business sustainability learning, teaching and assessment. Findings suggest using the university as a live sustainability case study provides a real world, experiential learning environment that encourages students to engage with the key principles of business sustainability and develop sustainability literacy and employment skills.

This study will assist members of the sustainability community seeking to engage students in generative sustainability through real-world experiential learning. It builds on existing pedagogic discourse on innovative approaches for business sustainability learning, teaching and assessment and contributes to research into participatory Business Education for Sustainability.

University of Worcester Business School, City Campus, Castle Street Worcester, WR1 3AS, United Kingdom.

Kay Emblen-Perry has several years of senior environmental and ecology consultancy experience delivering consultancy projects in renewable energy technologies, contaminated land remediation, biodiversity offsetting and ecological assessment for UK organisations. She is qualified as an environmental and quality lead auditor; has implemented environmental management systems for both UK and multinational organisations and has trained environmental and quality assessors. In previous roles, Kay gained senior project management and purchasing management experience in international automotive companies. She project managed the implementation of sustainable supply chain strategies, new vehicle projects and EU REACH Regulations. Kay's specialisation is in Sustainable Management including Environmental Management and Justice, Social Responsibility and Economic Sustainability.

Email contact:

k.emblenperry@worc.ac.uk

Open Source and Sustainability: the Role of University

Giorgio F. Signorini

Dipartimento di Chimica, Università di Firenze via della Lastruccia, 3 I-50019 Sesto F. (Firenze), Italy

One important goal in sustainability is making technologies available to the maximum possible number of individuals, and especially to those living in less developed areas (Goal 9 of SDG). However, the diffusion of technical knowledge is hindered by a number of factors, among which the Intellectual Property Rights (IPR) system plays a primary role. While opinions about the real effect of IPRs in stimulating and disseminating innovation differ, there is a growing number of authors arguing that a different approach may be more effective in promoting global development. The success of the Open Source (OS) model in the field of software has led analysts to speculate whether this paradigm can be extended to other fields. Key to this model are both free access to knowledge and the right to use other people's results. After reviewing the main features of the OS model, we explore different areas where it can be profitably applied, such as hardware design and production; we then discuss how academical institutions can (and should) help diffusing the OS philosophy and practice. Widespread use of OS software, fostering of research projects aimed to use and develop OS software and hardware, the use of open education tools, and a strong commitment to open access publishing are some of the discussed examples.

Giorgio F. Signorini graduated in Chemistry at the University of Florence in 1985 and earned a doctorate in Solid State Chemical Physics in the same University in 1989 with a thesis on "Dynamical Properties and Relaxation Processes in Condensed Molecular Systems". He has worked since in the field of physical chemistry and computational chemistry, mainly dealing with MD simulations of systems in the condensed state. In this subject area he took part in more than 40 Italian and international research projects during the years 1991-2018, publishing many articles on international journals, and contributing to the development of the ORAC software for advanced simulations of molecular systems. In the School of Natural, Physical and Mathematical Sciences of the University of Florence he has taught in many courses, ranging from theoretical chemistry to structure and dynamics of proteins, to glass and ceramics, to informatics. Since 1991 is member of the scientifical-technical staff of the Department of Chemistry of the same university, being in charge of computer facilities for scientific computations. In the many facets of his activity, he has advocated open source software use and development, both with students and colleague scientists. Signorini has been part of the University of Florence working group on sustainability since 2016, with a special commitment to diffusing the open source model as a key to technology transfer and sustainable development.

Email contact:

giorgio.signorini@unifi.it

“Salomone Sostenibile”: an Award to ‘Communicate’ the University's Leading Role in Sustainable Development

Luca Toschi [1], Marco Sbardella [2], Gianluca Simonetta [3]

This paper illustrates the process of designing and implementing the "Salomone Sostenibile" award. This initiative was born in conjunction with important efforts by the University of Florence, the Center for Generative Communication (CfGC), and the "Ateneo Sostenibile" group over the last two years to enhance and communicate knowledge and skills related to the complex sphere of sustainability. The award is an initiative aimed to promote, aggregate and systemize the best practices, experiences and studies on sustainability matters.

More than a simple award, Salomone Sostenibile is a true communication environment designed to aggregate the innovation and research generated by the University through their application in production processes and projects to improve well-being and quality of life at local and national level. The main innovative feature of this award is that it can create a community of interests, knowledge, competencies, and skills to innovate and generate sustainable behaviors at both individual and collective levels. In other words, not just a point of arrival and gratification for the best research and development experiences, but rather a starting point for identifying and creating relationships among the range of realities in education, research, production, associationism and civil society that contribute to promoting sustainable development. Thus, promoting this award, University of Florence can strengthen the leadership that universities have claimed for decades in this area.

In this sense, the award reinforces the univerisity’s Third Mission and bolsters relationships and mutual exchanges with the territory and its economic, institutional and social actors.

The award consists of four sections:

- best thesis;
- best project of a profit company;
- best project of a non-profit association;
- ambassador of sustainability. The first edition of the award will be celebrated during the II Symposium on Sustainability in University Campuses.

Keywords: Generative Communication; Sustainability Paradox; Community building; Salomone Sostenibile Award

[1,2,3] Center for Generative Communication, Department of Political and Social Sciences University of Florence, Via Laura 48, 50121, Florence (Italy)

Luca Toschi is the founder and director of the Center for Generative Communication (CfGC) and a full professor of Sociology of Cultural and Communicative Processes in the Department of Political and Social Sciences at the University of Florence (Italy). Author of La Comunicazione Generativa (Apogeo, 2011), he conceived of and promotes the generative communication paradigm in all areas of his work. Prof. Toschi, with the support of his team of CfGC researchers, explores the broad field of communication for technology transfer in numerous areas of society, economy and culture, as guided by complexity theory, his dedication to sustainability and the culture of peace, and philological methodology. He's committed to strong community building based on shared knowledge and developing communication able to generate common projects among subjects with different missions and visions to enrich and reinforce all involved parties with regard to their cultural, social, economic and political roles. He collaborates and consults, with regard to the sociology of communication, with governmental entities, enterprises, including publishers and publishing groups, and research and higher education bodies both in Italy and elsewhere. He is particularly interested in the relations between automation systems and human languages, and directs special attention to the impact of automation on cultural, social, and economic spheres. Throughout his career he has been committed to public engagement and the university's Third Mission.

Marco Sbardella, Ph.D., is research fellow (SPS/08) at the Center for Generative Communication (CfGC) of the Department of Political and Social Sciences, University of Florence. He teaches "Communication Theory and Techniques" in the degree course in "Humanities for Communication". Within the CfGC he develops research and projects related to sustainable behavior, international cooperation, governance and participation and mobilities

Gianluca Simonetta, Ph.D, is research fellow (SPS/08) at the Center for Generative Communication (CfGC) of the Department of Political and Social Sciences, University of Florence. He teaches "Communication Theory and Techniques" and holds the "Laboratory of Communicative Strategy, Analysis and Design" in the degree course in "Humanities for Communication". Within the CfGC he deals with content publishing and takes care of research and projects on digital writing for organizational communication and knowledge management.

Email contacts:

luca.toschi@unifi.it

marco.sbardella@unifi.it

gianluca.simonetta@unifi.it

Round Table Discussion: A College-Level Social Science-Based Sustainability Curriculum: Its Time has Come!

Nancy Lee Wood

Sustainability Studies from a multi-disciplinal Social Science perspective is an emerging field and, as such, has no traditional nor universal course requirements. Moreover, there are very few colleges or universities in the United States awarding degrees or certificates in Social Science- based "Sustainability Education." When Sustainability is the focus, it most often is relegated to Engineering and Environmental Studies, and increasingly to Agriculture and Business. This Round Table Discussion focuses on the need for and development of a multi-disciplinal Social Science-based Sustainability Curriculum oriented toward undergraduate college students. In the face of this century's crises emanating from climate change, resource depletions and species extinctions, the general public - including college youth - is woefully unprepared for the challenges and opportunities ahead. Using the newly minted Sustainability Studies Program at *BRISTOL Community College as an example, this Round Table Discussion focuses on opening dialogue among the session's participants in order to share information and experiences and to explore potential bridges of collaboration as we seek innovative, effective ways of educating students, colleagues, and education policy makers regarding Social Science-based transformative societal sustainability and resilience. This session will require technology for Power Point Presentations as discussants may wish to convey their work and ideas through slides.

*A two-year US institution of which there are approximately 1,400 educating 6.2 million students annually.

Program in Sustainability Studies Institute for Sustainability and Post-carbon Education BRISTOL Community College 777 Elsbree Street, E112 Fall River, Massachusetts 02720 United States of America

Nancy Lee Wood, Ph.D. is a Sociologist teaching at BRISTOL Community College in the United States. She is the Director of the Institute for Sustainability and Post-carbon Education and the Coordinator of the college's Program in Sustainability Studies. She writes and lectures frequently on issues of climate change and resource depletions and their impacts on developing, industrial, and post-industrial societies. She holds graduate degrees from the Graduate Faculty of the New School for Social Research in New York City (MA, Psychology) and the University of Colorado-Boulder (Ph.D., Sociology).

Email contact:

NancyLee.Wood@bristolcc.edu

- **Governing the university in the perspective of the United Nations 2030 Agenda: The case of the University of Bologna.**

  Paletta A., Degli Esposti M., Siboni B. and Bonoli A., University of Bologna,

Tuesday, 11th December 2018

15:30- 17:00 - Parallel Sessions

Session 6, Aula Ostensio

Students' Opinion about Green Campus Initiatives: A South American University Case Study

João Marcelo Pereira Ribeiro [1], Lenoir Hoeckesfeld [2], Stephane Louise BocaSanta [3], Giovanna Guilhen Mazaro Araujo [4], Ana Valquiria Jonck [5], Issa Ibrahim Berchin [6], José Baltazar Salgueirinho Osório de Andrade Guerra [7],

High Education Institutions are of strategic importance to increase the awareness on sustainable development. The Green Campus initiative planned to implement infrastructures on universities campuses, regarding environmental, economic, and social impacts. By involving the campus users, sustainable infrastructures, classes, research, management, communication and by outreach. These initiatives develop support for environmental education and campus users about sustainable development. Therefore, this research intents to analyze a South American University student's opinion about sustainable development (people) and university infrastructure for sustainable development (place). This study was developed by descriptive statics techniques, and by a survey that resulted in 305 answers from students at the Business Department of the University. This article will increase the academic knowledge about Green Campus through empirical data and will provide recommendations for the next path regarding sustainable initiatives in Higher Education Institutions.

Keywords: green campus; green universities; sustainable development; sustainable universities

University of Southern Santa Catarina (Unisul), Brazil

João Marcelo Pereira Ribeiro, Researcher at Group on Energy Efficiency and Sustainability- GREENS.

Lenoir Hoeckesfeld, Researcher at Process and Develop of Management Strategies (PROFORME/UNIVALI).

Stephane Louise BocaSanta, Researcher at Nucleus of Studies on Environment and Accounting (NEMAC/UFSC).

Giovanna Guilhen Mazaro Araujo, Researcher at Energy Efficiency and Sustainability Research Group (Greens/UNISUL)

Ana Valquiria Jonck, Researcher at Energy Efficiency and Sustainability Research Group (Greens/UNISUL)

Issa Ibrahim Berchin, Researcher at Group on Energy Efficiency and Sustainability- GREENS

José Baltazar Salgueirinho Osório de Andrade Guerra, Leader of the Research Group in Energy Efficiency and Sustainability – GREENS.

Email contacts:

joaomarceloprdk@gmail.com

leno.adm@gmail.com

stephanelou.bs@gmail.com

guilhengiovanna@gmail.com

anajonck15@gmail.com

issaberchim@gmail.com

baltazar.guerra@Unisul

Engaging Students in Cross-Disciplinary Research and Education A Processual Approach to Educational Development

Ulla A. Saari [1], Saku J. Mäkinen [2], Pertti Järventausta [3], Matti Vilkko [4], Kari Systä [5], Kirsi Kotilainen [6], Jussi Valta [7], Tomas Björkqvist [8], Teemu Laukkarinen [9]

The creation of future sustainable and efficient energy systems requires a cross-disciplinary approach in engineering education. In order for energy-related engineering students to be prepared for real -world situations after their studies, it is important that, while they are still studying, they obtain the basic skills for handling different concepts, theoretical frameworks and solution types created in the various disciplines involved. At the Tampere University of Technology (TUT), a cross-disciplinary team was formed from four different departments in three different faculties to create a platform for research and education purposes on the university campus. The purpose was to coordinate research and provide students with a wider picture and a concrete implementation of the different layers and aspects that need to be taken into account when creating innovative solutions for future digital energy systems. The creation of the platform started from a successful student ideation competition that produced many viable solutions. This paper describes the bottom-up incremental process by which the cross-disciplinary platform was created. The innovative solutions created in the student ideation competition convinced the university organization that the cross-disciplinary collaboration should have a more permanent platform on the university campus, allowing researchers and students to incorporate more sustainability and systemic aspects into their work, and having a positive impact on the sustainable energy consumption on the campus.

Keywords: Cross-disciplinary, Engineering education, Education for sustainable development, Sustainable energy

[1,2 6, 7]Laboratory of Industrial and Information Management, Tampere University of Technology, Finland

[3] Laboratory of Electrical Energy Engineering, Tampere University of Technology, Finlaand

[4, 8] Laboratory of Automation and Hydraulic Engineering, Tampere University of Technology, Finland

[5,9]Laboratory of Pervasive Computing, Tampere University of Technology,Finland

Ulla A. Saari is a Postdoctoral Researcher at the Laboratory of Industrial and Information Management at the Tampere University of Technology (TUT), Finland.

Saku J. Mäkinen, is the Vice Dean of Research and Professor of Industrial Management at TUT, and Research Director at University of Helsinki/CERN, Switzerland.

Pertti Järventausta is a Professor of Electrical Energy Engineering at the Laboratory of Electrical Energy Engineering at TUT.

Matti Vilkko is Professor of Automation and Hydraulic Engineering at the Laboratory of Automation and Hydraulic Engineering at TUT.

Kari Systä is an Associate Professor (tenure track) at the Laboratory of Pervasive Computing at TUT.

Kirsi Kotilainen (M.Sc.) is a Doctoral Student at the Laboratory of Industrial and Information Management at TUT.

Jussi Valta (M.Sc.) is a Project Researcher at the Laboratory of Industrial and Information Management at TUT.

Toma Björkqvist is a Senior Research Fellow at the Laboratory of Automation and Hydraulic Engineering at TUT.

Teemu Laukkarinen is a Postdoctoral Researcher at the Laboratory of Pervasive Computing at TUT.

Email contacts:

ulla.saari@tut.fi

saku.makinen@tut.fi

pertti.jarventausta@tut.fi

matti.vilkko@tut.fi

kari.systa@tut.fi

kirsi.kotilainen@tut.fi

jussi.valta@tut.fi

tomas.bjorkqvist@tut.fi

teemu.laukkarinen@tut.fi

The Fisherman and the Farmer: a Theatrical Piece to Engage the Students in the Concept of Sustainability

Ilaria Perissi [1], *Ugo Bardi* [2]

Teaching sustainability to students at the high school and undergraduate level is often difficult because the students perceive the issue as an abstract one. In a number of qualitative tests we performed, we noted how the students were often able to repeat the statements they heard in class, but they hadn't really understood their relevance to the current plight of humankind.

Therefore, we engaged in the development of a theatrical piece on sustainability which could also be managed as a role-playing game where the students participated directly. We refer to this piece as "The Fisherman and the Farmer," it is based on the idea – supported by our studies on fisheries – that fishermen tend to overexploit their resources because they have no direct information on the abundance of the resources they exploit (the fish) and no tools to keep production below the carrying capacity of the system. Farmers, instead, have complete information and direct control of their resources – their cultivated fields – and can manage to avoid overexploitation.

Of course, the behavior of real farmers and real fishermen is not so schematic, but in this teaching piece the difference is exploited in order to explain the concepts of overexploitation and overshoot. In the play, the actors, who may be students who volunteer for the task, take the role of a family of fishermen and of a family of farmers – discussing their different approaches and the results they expect from it. After the play, the student who are at the college level can be exposed to the mathematical models describing overexploitation and their applications to fisheries.

We tested this representation at several levels, from junior high school to undergraduate courses, and we found that it was often effective in enliven the subject for the students and to make them more receptive to further explanations. Further testing is in progress.

Keywords: teaching, sustainability, overshoot, natural resources

[1,2] Dipartimento di Chimica – Università di Firenze, Via della Lastruccia 3 – 50019 Sesto Fiorentino (Fi) – Italy

Ilaria Perissi, Currently Senior Researcher at National Interuniversity Consortium of Materials Science and Technology (INSTM), Ilaria obtained both the Master Degree in Physical Chemistry and the PhD in Material Science from the University of Florence. She has alternated work experience in the academic field and the private sector, developing skills in the field of energy saving and renewable energy. Recently she has expanded her research to Systems Dynamics, developing models on resources exploitation and overexploitation. Ilaria collaborated on several European projects, and, currently she is engaged in MEDEAS project (H2020) to design scenarios on renewable energy transition in Europe. She is a member of the Italian Society of Systems Dynamics and since 2017 she is Honoray Fellow in Physical Chemistry at the University of Florence.

Email contacts:

ugo.bardi@unifi.it

Ilaria.perissi@unifi.it

Green Campus and Enviromental Preservation on a Brazilian University

Evanisa Fátima Reginato Quevedo Melo [1]
Marcos Antonio Leite Frandoloso [2]
Ricardo Henryque Reginato Quevedo Melo [3]

The University of Passo Fundo, during its 50 years of implantation, has searched to insert itself in the urban landscape of the city, being urban or landscape terms. The methodology for elaboration of the Environmental Management Plan of the Flora in the Campus I, attending the Environmental Management System guidelines of the UPF. Were identified tree species in botanic survey e defining the Areas of Permanent Preservation, with individuals components from the native vegetation in the region of the Mixed Ombrophilous Forest. From these surveys it was pointed as a mitigating measure the formation of an ecological corridor with a strip of native vegetation creating a green area for the interconnection of these arboreal fragments; equally indicates the implementation of a vegetal replacement plan with native species. The importance of this area is highlighted by creating an environment where users (internal and external community) can perceive several examples of flora; besides contributing to the improvement of the microclimate with a dense green area interconnecting several buildings. The University not only strengthens its formation role of students and teachers and external community that uses Campus I as an urban park, but also enhances the sustainable performance in the local and regional.

[1,2] Faculty of Engineering and Architecture
University of Passo Fundo
BR-285
Passo Fundo, Brazil

[3] Faculty of Engineering and Architecture
Federal University of Rio Grande do Sul/ IMED Avenida Osvaldo Aranha, 99
Porto Alegre, Brazil

Evanisa Fátima Reginato Quevedo Melo, Possui graduação em Engenharia Florestal pela Universidade Federal de Santa Maria (1985), graduação em Agronomia pela Universidade Federal de Santa Maria (1987), mestrado em Ciências do Solo pela Universidade Federal do Paraná (1990) e doutorado em Agronomia pela Universidade Federal de Santa Maria (2006). Atualmente é professor titular da Universidade de Passo Fundo. Tem experiência na área de Agronomia, com ênfase em Agronomia e Engenharia Florestal, atuando principalmente nos seguintes temas: paisagismo, educação ambiental, qualidade ambiental, planejamento, arborização urbana e vegetação, resíduos sólidos e recursos hídricos.

Possui graduação em Curso de Arquitetura e Urbanismo pela Universidade Federal de Pelotas (1986), mestrado em Arquitetura pela Universidade Federal do Rio Grande do Sul (2002) e Doutor Internacional pelo Programa de Doctorat en Arquitectura, Energia i Medi Ambient - Universitat Politècnica de Catalunya (2018), reconhecido como Doutor em Arquitetura e Urbanismo pela Universidade Federal do Rio Grande do Norte (2018).É professor Titular I da Universidade de Passo Fundo. Coordenador do CST em Design de Produto da UPF de 2010 à 2018.

Tem experiência na área de Arquitetura e Urbanismo, com ênfase em Planejamento e Projetos da Edificação, atuando principalmente nos seguintes temas: eficiência energética, projeto de arquitetura, planejamento urbano, campus universitário e energia e meio ambiente.

Doutorando no Programa de Pós-Graduação em Engenharia Civil: Construção e Infraestrutura da UFRGS. Mestre em Engenharia Civil e Ambiental com área de concentração em Infraestrutura e Meio Ambiente pelo PPGENG - UPF (2017) com formação em Engenharia Civil pela Universidade de Passo Fundo (2015). Atualmente é professor titular da Faculdade IMED.

Tem experiência na área de engenharia, atuando principalmente nos seguintes temas: Sustentabilidade, Recursos Hídricos, SIG, Campus Universitário e Planejamento.

Email contacts:

evanisa@upf.br

frandoloso@upf.br

ricardohquevedo@gmail.com

- **U.lab Social Innovation Hub training in University Campuses.**
  Elena Piani, and Susan George. Piani Projects and University of Florence, Italy

Wednesday, 12th December 2018

9:00-11:00 - *Plenary Presentations*
Aula Magna

INSPIRE Sustainability Internships: Promoting Campus Greening Initiatives Through Student Participation

Carolyn Hayles

Since the establishment of its Institute of Sustainable Practice, Innovation and Resource Effectiveness(INSPIRE) in 2012, the University of Wales, Trinity Saint David, has been growing its commitment to sustainability on campus. Delivering on that commitment, INSPIRE set out to create an opportunity for students that would engage them in the sustainability agenda through campus-based activities. INSPIRE internships were first introduced in 2013/14 as a reward scheme run in partnership with the Students' Union. The programme, now in its fifth year, provides an opportunity for paid work experience, whilst encouraging students to participate in and support sustainability-related projects on campus that work with the University's sustainability ambitions. Staff from INSPIRE (teaching and research) and the Sustainability Delivery Team (facilities and operation) mentor the interns as they expand their sustainability knowledge, skills and passions. The scheme has gone from strength to strength, with the range of projects increasing year on year. In this paper we share examples of these campus -based greening initiatives, including feedback from the interns on their experiences of working with INSPIRE and the Sustainability Delivery Team, what they have learnt from their internships (both soft and hard skills), and their recommendations for future interns and campus greening projects.

Institute of Sustainable Practice,
Innovation and Resource Effectiveness
(INSPIRE)
University of Wales, Trinity Saint David
Swansea SA1 6ED, Wales, UK

Carolyn Hayles has 23 years' experience working as an academic and consultant; undertaking design, consultancy, lecturing and research in the disciplines of architecture, interior design, construction delivery and management. Carolyn's expertise is in green building, biophilic and sustainable design and construction including climate change resilience and amelioration, with a particular research interest in the delivery of sustainable decision-making processes and frameworks. During this time, Carolyn has worked in the UK, USA, Australia, Hong Kong and Singapore. Carolyn is currently Academic Lead for the Institute of Sustainable Practice, Innovation and Resource Effectiveness (INSPIRE) at the University of Wales, Trinity Saint David where she has a remit to undertake research on and support the delivery of Education for Sustainable Development and Global Citizenship (ESDGC) across all disciplines. This includes validating all degree programmes, the co-ordination and delivery of a pan-university certificate on 'Sustainable Development and the Well-being of Future Generations', as well as the delivery of an internal grant programme aimed at supporting improvements in ESDGC.

Email contact:

carolyn.hayles@uwtsd.ac.uk

Creating a Context for Campus Sustainability Through Teaching and Learning: The Case of Open, Distance and e-learning

Rudi Pretorius [1], Ryan Anderson [2], Anisa Khotoo[3], Richelle Pienaar [4]

The traditional concept of a campus as a physical space where academic staff and students interact in person, obtain a different meaning in open, distance and e-learning (ODeL), where such contact is not possible, or take place exclusively via virtual learning environments (VLE's). For ODeL students, their respective living and working environments constitute the living labs within which they need to apply their learning. Utilising a sample of ODeL modules focusing on sustainability learning, this chapter serves to illustrate that contextual, place-based assessment can lead to full student engagement with sustainability despite the lack of the physical presence of students on campus. The referred to modules ("Ecotourism", "Environmental awareness and responsibility" and "Assessing environmental impacts") are offered by the Department of Geography at the University of South Africa (a major South African and worldwide ODeL provider). These modules are part of the final year for the BA/BSc in Environmental Management and utilise various permutations of blended learning. Within this context, a reflexive account is provided how the learning experiences created by these modules simulate living labs for sustainability wherein students can conduct their assessments in their local living environments. Through collaborative group enquiry the authors unpack the pros and cons of this approach, endeavour to correct misconceptions on the role and value of ODeL in transforming towards sustainability and conclude by indicating possible future initiatives.

Keywords: Transformation, campus sustainability, teaching and learning, blended learning, open, distance and e-learning, contextual assessment, living labs for sustainabili

[1,2,3,4] Department of Geography, Science Campus, University of South Africa, Private Bag X6, Florida 1710, South Africa

Rudi Pretorius is an associate professor in the Department of Geography, Unisa. He recently completed a Ph.D. in Geography focusing on the potential and role of Geography in education for sustainability in the South African higher education context.

Ryan Anderson is a lecturer in the Department of Geography and currently enrolled for a Ph.D. in Geography at the University of the Free State. His research interests include soil erosion, gully development and extreme rainfall events.

Anisa Khotoo is a junior lecturer in the Department of Geography, Unisa. She recently completed a M.Sc. in Environmental Management. Her research interest focuses on energy efficiency in the residential sector of South Africa and she has a keen interest in education for sustainability.

Richelle Pienaar is a lecturer in the Department of Geography, Unisa. She holds a BSc Honours and is currently pursuing a M.Sc. in Geography. Her research interests include education at both tertiary and secondary level, physical and environmental Geography.

Email contacts:

pretorw@unisa.ac.za

anderrl@unisa.ac.za

khotoa@unisa.ac.za

Engaging Students and Campus Community in Sustainability Activities in a Major Canadian University

Tatiana Teslenko

Higher education institutions (HEI) have the potential to engage local and global communities in transformative learning for sustainable principles and practices. However, transforming a university campus into a model of sustainable development and best practice is a challenging task. It is only possible by engaging students, faculty, staff, and the campus community, as well as local and global partners. During the last decade Canadian universities have ramped up their efforts in order to support community engagement and partnerships. They aim to connect their research and innovation capacity with the policy and implementation challenges of partner organizations.

The University of British Columbia (UBC) has actively pursued sustainability goals and targets for over twenty years. By establishing the University Sustainability Initiative (USI), UBC went a step further than other Canadian universities. The paper presents an overview of the evolution of the university's sustainability strategy and focuses on sustainability-related developments within the last decade. It discusses five on-campus and off-campus engagement programs that contribute to UBC's sustainability goals: the SEEDS program, Sustainability Ambassadors, "UBC Reads Sustainability", Student Sustainability Council, and Sustainability-in-Residence, the Greenest City Scholars at the Point Grey campus in Vancouver, Canada.

These programs exemplify joint efforts for promoting sustainable behaviors and practices that contribute to a net-positive campus and promote human and ecological wellbeing. Developments and findings discussed in the paper could be of value for many HEI interested in successful ways to engage students, staff, faculty, and the broader community in the practice of sustainability.

Department of Mechanical Engineering, Faculty of Applied Science, University of British Columbia, 2054-6250 Applied Science Lane, Vancouver, BC, Canada V6T1Z4

Tatiana Teslenko holds a Kandydat of Philological Sciences degree from Odessa University, Ukraine (1989) and a PhD from Simon Fraser University in Canada (2000). She is Professor of Teaching at the Department of Mechanical Engineering in the University of British Columbia. Her research interests include education for sustainable development, engineering communication, and experiential learning. Dr. Teslenko authored four books and dozens of papers in communication studies and transformative learning pedagogy. She designed and launched several programs for international students (such as ASSIST UBC and the Graduate Teaching Assistants training program). She was the founder and inaugural Director of the Centre for Professional Skills Development at the Faculty of Applied Science at UBC .

Email contact:

tteslenko@gmail.com

Wednesday, 12th December 2018

11:30-13:00 - Parallel Session

Session 1, Aula Magna

Sustainability in Universities: with a Special Attention to Hazardous Waste Management

Ana Maria Maniero Moreira [1]
Wanda M. Risso Günthe [2]

Higher Education Institutions represent an important role for the socio-environmental sustainability of contemporary societies. Universities are generating skills, knowledge, teaching and learning that contribute to environmental awareness not only for students but also society in general. The School of Public Health (FSP) is a public health and research institution located in the center of the city of Sao Paulo Brazil, representing one of the 48 graduate schools of the University of Sao Paulo. This paper presents the results reached by the Sustainability Program, in progress in FSP since 2014, detailing its efforts to comply with sanitary, environmental and labor regulations, as well some of the proactive attitudes adopted to solve waste management matters. A Healthcare Waste Management Plan has been gradually implanted at waste avoidance, promotion of proper and safe waste handling, and the prevention of health and environmental impacts. Projects, researches, lectures, workshops, campaigns and events related to environmental and occupational health have empowered the dissemination of environmental education, community awareness, and given continuity to the program. Indicators have been used to monitor the process and to communicate outcomes. Limitations faced until the present are the lack of economic and human resources, but they have been overcome, mainly thanks to efforts, solidarity and entrepreneurial vision of volunteers.

[1] Department of Public Health, School of Public Health, University of Sao Paulo, Brazil

[2] Department of Environmental Health, School of Public Health, University of Sao Paulo, Brazil.

Ana Maria Maniero Moreira, Brazilian, bachelor in Medicine, master and doctor degrees in Science. Currently is acting as a postdoctoral fellowship in the Department of Public Health, School of Public Health, University of Sao Paulo, Brazil, and works as a technical consultant in the Healthcare Waste Management area.

Wanda M. Risso Günther, Brazilian, bachelor in Engineering and Sociology, master and doctor degrees in Public Health, postdoc in Geochemistry, Currently is full professor in Department of Environmental Health, School of Public Health, University of Sao Paulo, Brazil.

Email contacts:

anamariainforme@hotmail.com

wgunther@usp.br

The ECOMAPS Project: How the Academy Can Get Involved in Local Waste Management Projects

Sara Falsini [1], Ugo Bardi [2]

Waste management is becoming an urgent element of sustainability where university campuses can provide a substantial contribution in: 1) offering the competence necessary to optimize waste management and 2) giving the example in how to correctly manage waste in a relatively large entity such as in a university campus.
In this area, the University of Florence engaged, together with the National Consortium on the Science and Technology of Materials (INSTM), in a project: ECOMAPS financed by the Tuscan Regional Government. ECOMAPS has the aim of developing a web-based platform which is addressed to everyone but in particular to industries to optimize waste disposal. Thus, the customer, who needs to dispose of waste, will be directly connected with the appropriate facility. The novelty of ECOMAPS lies in the geolocation system which allows the users to easily find the closest facility for waste disposal. This web page will be connected to an already existent blog *Ecomaps news where the user not only can get the information related to waste disposal but also the technical support. The project is at present focused on industrial waste, but it can be extended to urban waste and we plan to create a model platform for the management of on-campus waste.*

Keywords: Special waste, Waste Management, Sustainability, Ecomaps

[1] INSTM (National Consortium on the Science and Technology of Materials)-Dep. of Chemistry,
University of Florence, Via della Lastruccia 3 50019 Sesto Fiorentino, Firenze (FI)

[2] Department of Chemistry,
University of Florence
Via della Lastruccia 3 50019 Sesto Fiorentino, Firenze (FI)

Ugo Bardi teaches at the University of Florence, in Italy, where he is engaged in research on sustainability and energy with a special view on the depletion of mineral resources, circular economy, and recycling. His main interest, at present, is the study of the mechanisms of collapse of complex systems – from mechanical devices to entire civilizations. All these systems seem to follow similar patterns, in particular they grow slowly but collapse rapidly. It is what Bardi calls "The Seneca Effect" from a sentence written long ago by the Stoic Roman Philosopher Lucius Annaeus Seneca.
Ugo Bardi is a member of the Club of Rome, chief editor of the Springer journal "Biophysical Economics and Resource Quality," and member of several international scientific organization. He is active in the dissemination of scientific results in sustainability and climate science on the blog "Cassandra' Legacy" (www.cassandralegacy.blogspot.com). He is the author of numerous papers on sustainability and of the recent books "The Limits to Growth Revisited" (Springer 2011), "Extracted – how the quest for mineral wealth is plundering the planet" (Chelsea Green, 2014), and "The Seneca Effect" (Springer 2017). His books have been translated into French, German, Spanish, and Rumenian.
Ugo Bardi is an Italian citizen, born in 1952. He lives in the town of Fiesole, near Florence, in Italy, with his wife, Grazia. His son, Francesco, is a petroleum geologist working in Holland, his daughter (Donata) is completing her studies in neuropsychology.

Sara Falsini obtained her degree in Biology (2010) and PhD in Biomedical Science (2014) at the University of Florence, Italy. The expertise acquired during her PhD thesis is on (i) cell and molecular biology, (ii) preparation and characterization of lipid-based vectors for drug delivery and pharmacological tests. Her personal skills thus extend from cell culture handling to Physico-chemical methods for the study of nanoaggregates delivery i.e. Electron Spin Resonance, Dynamic Light Scattering, Zeta Potential and Small Angle X-Rays Scattering.
During her post-doc, she has approached the sustainability field with a project which has provided nanotechnology preparation with ecocompatible procedures and in the European project H2020 called MEDEAS. She is also involved in a project financed by the Tuscan Regional Government, ECOMAPS where she takes care of the blog informing people about the news in the field of waste and circular economy in general.

Email contacts:

sara.falsini@unifi.it

ugo.bardi@unifi.it

Taking the Students to the Landfill: A Hands-on Approach to Teaching Waste Management in a Natural Science Curriculum

Sara Falsini [1], Sandra Ristori [2], Ugo Bardi [3]

The College-Level Curriculum in Natural Sciences in Italy often includes chemical or biological processes intended for waste treatment and disposal, as well as processes such as waste incineration. Rarely, however, this curriculum includes waste management as part of the concept of "circular economy".
In the present communication, we describe the experience of a practical involvement with waste management of students in their master-degree in chemistry. As part of the class of "advanced materials technology" of the school of Natural Science at the University of Florence the students were not only introduced to the basic concepts of waste recycling, but also taken to visit the local landfill and other local recycling plants. Intense smells were part of the experience and seem to have considerably impressed the students. Their reaction to this approach was recorded by means of interviews and will be discussed here.

Keywords: Waste Management, Sustainable Campus, Waste collection, Landfills.

[1,2,3] Department of Chemistry, University of Florence, Via della Lastruccia 3 50019 Sesto Fiorentino, Firenze (FI) - Italy

[1] INSTM (National Consortium on the Science and Technology of Materials), Via della Lastruccia 3 50019 Sesto Fiorentino, Firenze (FI) – Italy

Sandra Ristori is Associate Professor at the Chemistry Department of the University of Florence, in Italy, where she teaches Nanosystems for Biotechnology and Physical Chemistry of Cell Organization in the advanced Biology curriculum.
She has long term experience in the design and characterizations of nanosystems, as well as in the study of far from equilibrium chemical reactions in confined media. To carry out this research, Sandra Ristori has made extensive use of Large Scale Facilities, such as the European Synchrotron in Grenoble and the Laboratoire Léon Brillouin in Saclay. She has also built a network of national and international collaborations with researchers working in the fields of Soft Condensed Matter Physics and Biology.
Her current research interests concern possible routes for preparing nanoformulations to address sustainability issues. Examples of the systems under studies are lipid-based vehicles for phytohormone delivery and lignin nanoparticles as carriers for natural biomolecules to reactivate quiescent seeds of rare plants or species with high relevance in the Tuscany economy. This projects are performed following the best practices of waste recycling and circular economy.
Sandra Ristori is co-author of about 100 articles published in International peer-reviewed Journals, one Patent and several Book Chapters.
Sandra Ristori is an Italian citizen, born in 1960. She lives Florence, Italy, with his husband Luca, and his son, Lorenzo, who's undergraduate student in Physics.

Sara Falsini obtained her degree in Biology (2010) and PhD in Biomedical Science (2014) at the University of Florence, Italy. The expertise acquired during her PhD thesis is on (i) cell and molecular biology, (ii) preparation and characterization of lipid-based vectors for drug delivery and pharmacological tests. Her personal skills thus extend from cell culture handling to Physico-chemical methods for the study of nanoaggregates delivery i.e. Electron Spin Resonance, Dynamic Light Scattering, Zeta Potential and Small Angle X-Rays Scattering. During her post-doc, she has approached the sustainability field with a project which has provided nanotechnology preparation with ecocompatible procedures and in the European project H2020 called MEDEAS. She is also involved in a project financed by the Tuscan Regional Government, ECOMAPS where she takes care of the blog informing people about the news in the field of waste and circular economy in general.

Ugo Bardi teaches at the University of Florence, in Italy, where he is engaged in research on sustainability and energy with a special view on the depletion of mineral resources, circular economy, and recycling. His main interest, at present, is the study of the mechanisms of collapse of complex systems – from mechanical devices to entire civilizations. All these systems seem to follow similar patterns, in particular they grow slowly but collapse rapidly. It is what Bardi calls "The Seneca Effect" from a sentence written long ago by the Stoic Roman Philosopher Lucius Annaeus Seneca.
Ugo Bardi is a member of the Club of Rome, chief editor of the Springer journal "Biophysical Economics and Resource Quality," and member of several international scientific organization. He is active in the dissemination of scientific results in sustainability and climate science on the blog "Cassandra' Legacy" (www.cassandralegacy.blogspot.com). He is the author of numerous papers on sustainability and of the recent books "The Limits to Growth Revisited" (Springer 2011), "Extracted – how the quest for mineral wealth is plundering the planet" (Chelsea Green, 2014), and "The Seneca Effect" (Springer 2017). His books have been translated into French, German, Spanish, and Rumenian.
Ugo Bardi is an Italian citizen, born in 1952. He lives in the town of Fiesole, near Florence, in Italy, with his wife, Grazia. His son, Francesco, is a petroleum geologist working in Holland, his daughter (Donata) is completing her studies in neuropsychology.

Email contacts:

sara.falsini@unifi.it

ugo.bardi@unifi.it

UNIFAAT Solid Waste Management Plan: Education and Environmental Perception

Estevão Brasil Ruas Vernalha[1], Micheli Kowalczuk Machado[2]
João Luiz de Moraes Hoefel[3]

The search for sustainability has promoted debates, analysis and programs for the elaboration and implementation of environmental policies in various society sectors. In this process, the inherent complexity of understanding environmental problems and their direct relation to human activities becomes increasingly evident. As an example, the problem related to solid waste must be highlighted. This issue involves factors such as patterns of production and consumption, negative environmental impacts on fauna and flora, contamination of soil and water, etc. From this perspective, it is important to emphasize the role of education and higher education institutions in the mobilization and articulation of individuals as transforming agents of the socioenvironmental reality in which they are inserted. In this perspective, this work aims to present the analysis of students' perceptions of UNIFAAT, located in Atibaia, São Paulo, Brazil, Solid Waste Management Plan (SWMP), which has been in operation since 2014. The program is an action developed by the Center for Studies, Post graduate and Extension Activities (CEPE/ UNIFAAT) and it has achieved relevant socioenvironmental results such as reducing the volume of waste sent to landfills, generating income for recycling communities' members and their families and environmental awareness of students and teachers .

Keywords: Higher education institution, Solid Waste Management, Environmental education

[1,2,3] Núcleo de Estudos em Sustentabilidade e Cultura - NESC/CEPE
Centro Universitário UNIFAAT
Estrada Municipal Juca Sanches, 1050 - Boa Vista, Atibaia, São Paulo - Brazil

Estevão Brasil Ruas Vernalha is a regular PhD student in the Energy Systems Planning program at University of Campinas (PSE/FEM/UNICAMP). He has a Master's Degree from the same program (PSE/FEM/UNICAMP) and is a specialist in Environmental Management from University of São Paulo (ESALQ/USP). Currently, he is the administrative coordinator of Centre for Studies, Research and Extension of UNIFAAT University Centre (UNIFAAT), Atibaia, SP, where he teaches disciplines related to environmental sciences. He also works in the following study groups: Laboratory of Studies on Environmental Change, Quality of Life and Subjectivity (LEMAS/UNICAMP) and Group of Studies in Mobility (GEM/UNICAMP).

Micheli Kowalczuk Machado has a Ph.D. in Applied Ecology at São Paulo University (ESALQ/USP), São Paulo, Brazil, with a focus on environmental issues; she has a Master's Degree from the same program and is a specialist in Environmental Education from São Paulo University (USP). She teaches disciplines related to environmental sciences at Atibaia University Centre (UNIFAAT), Atibaia, São Paulo, where she also coordinates the Environmental Management Course and develops research projects on Natural Resources Conservation, Environmental Education and Environmental Planning.

João Luiz de Moraes Hoeffel has a Ph.D. in Social Sciences at Campinas State University (IFCH/UNICAMP), São Paulo, Brazil, with a focus on environmental issues and developed a Post-Doctoral research at the Centre for Environmental Education and Public Policies at São Paulo University (ESALQ/USP). He teaches at Atibaia University Centre (UNIFAAT), Atibaia, São Paulo, where he also coordinates the Centre for Sustainability and Cultural Studies (NESC/UNIFAAT) developing research projects on Natural Resources Conservation, Environmental Education and Environmental Planning, and at University of São Francisco, Bragança Paulista. He also develops research activities at NEPAM/UNICAMP on Global Environmental Change and Quality of Life as a Collaborator Researcher

Email contacts:

estevao.gestao@gmail.com

michelmkm@gmail.com

jlhoeffel@gmail.com

The Brazilian Educational System: An Analysis of a Hypothetical Full Shift to Distance Teaching

José Hugo de Oliveira [1], *Cecília Maria Villas Bôas de Almeida* [2]

According to statistics published by governmental agencies, 58 million students are currently enrolled in formal education courses available in the Brazilian educational system as a whole. A time series covering the years 2005-2015 reveals a descending number of enrollments in basic traditional school courses and an ascending amount of students attending distance-teaching courses. Distance Teaching has been hailed as an environmentally friendlier alternative to full -time campus activities, in papers with valid statistical data. However, the authors of this work performed the environmental accounting and compared the use of natural resources needed to implement and operate two similar courses, one under traditional classroom conditions, and its distance-teaching version, using the Emergy Accounting method, which allows for different types of energy to be accounted together by using solar energy Joules as a common unit. The results show that implementing and operating the distance-teaching version required 110% more investment in natural resources than the traditional version. This result motivated the analysis, presented in this paper, of the required investment in resources supporting the entire Brazilian educational system, combined with scenarios resulting from a hypothetical full shift from traditional in-class to distance teaching.

Keywords: Distance Teaching, Emergy Accounting, Brazilian Education System

[1] Federal Institute of Education, Science, and Technology of the South of Minas Gerais, Inconfidentes-MG, Brazil
[1,2] Laboratory of Cleaner Production and Environment – LaProMA - Paulista University
São Paulo-SP, Brazil

José Hugo de Oliveira is a master in Engineering Production; researcher under the "Cleaner Production and Industrial Ecology" research line; holds post-graduation Lato Sensu degree in Methodology of Higher Teaching; holds bachelor's degree at Letters. Has experience in foreign languages teaching. Faculty member at Instituto Federal do Sul de Minas Gerais, where he teaches English and Environmental Assessment, he was the head of the distance teaching center from 2010 to 2015. He is currently attending the PhD program at Universidade Paulista under Dr. Almeida's guidance.

Cecilia M. V. B. Almeida has a degree in Chemical Engineering from the Universidade Presbiteriana Mackenzie and a PhD in Chemistry (Physics and Chemistry) from the University of São Paulo (1999).
Full Professor at ICET (Institute of Exact and Technological Sciences) and Post-Graduation Program in Production Engineering at Universidade Paulista since 2000. She develops research in Cleaner Production and Industrial Ecology, where concepts, tools and techniques are assessed for the calculation of environmental and sustainability indicators. She also works as a researcher at LaPROMA (Laboratory of Production and Environment) of the Paulista University, and is an active member of the Advances in Cleaner Production Network. From 2012 to 2016, she served as Subject and Executive Editor: Cleaner Production in Latin America , and since 2017 Cecilia is the Co-Editor-in-Chief of the Journal of Cleaner Production.

Email contact:

jose.oliveira@ifsuldeminas.edu.br

- **Moving Toward Zero Waste Cities: A Nexus for International Zero Waste Academic Collaboration (NIZAC).**
  Jonathan Hannon, Atiq Zaman, Gustavo Rittl, Raphael Rossi, Sara Meireles and Fernanda Elisa Demore Palandi, Massey University, New Zealand; Curtin University, Australia; University of the State of Santa Catarina, Brazil; Formia Rifiuti Zero, Italy

Wednesday, 12th December 2018

11:30-13:00 - Parallel Session

Session 2, Aula Strozzi

Involving Students in Implementing a Campus Culture of Sustainability

Madhavi Venkatesan

Courses in sustainability studies are garnering significant interest across U.S. colleges and universities and are increasingly represented in a wider range of disciplines including economics. The latter addition is consistent with the Brundtland recommendation and offers a significant opportunity to foster understanding of both the basis for present decision-making as well as the values foundation required for the shift from a consumerism-fostered culture to one of sustainable economic development based on intergenerational equity. This paper provides an overview of an Economics of Sustainability course offering at Northeastern University in Boston. Students in the course were assigned to groups wherein they determined a group-based semester long project. The parameters of the project required a lifecycle or cost benefit assessment inclusive of externalities specific to a current university action that could be modified to promote campus sustainability. Given that sustainability was an objective and marketing stance of the institution, the projects, which ranged from a consignment store to local food sourcing to resource measurement and efficiency, were aligned to the overall university goals and were designed to be shared with university administration and ultimately, implemented. The latter aspect provided students with both an incentive and tangible outcome that promoted their longer-term educational goals. Overall, the assignment process is one that can be replicated and offers an opportunity to incorporate sustainability culture within a course design.

Department of Economics
Northeastern University
Boston, Massachusetts 02115

Madhavi Venkatesan earned a PhD, MA, and BA in Economics from Vanderbilt University, a Masters in Sustainability and Environmental Management from Harvard University, and a Masters in Environmental Law and Policy from Vermont Law School. A recipient of a Fulbright Distinguished Lectureship (Philippines), she has contributed to numerous books and journal articles on the subject of sustainability and economics. Her present academic interests include the integration of sustainability into the economics curriculum.

Email contact:

m.venkatesan@northeastern.ed

Towards Regional Circular Economies 'Greening the University Canteen' by Sustainability Innovation Labs

Susanne Maria Weber [1], Marc-André Heidelmann [2]

The model discussed here has been designed and experimented with in 2015 and now is going to be established at a regional level between Philipps-University of Marburg and regional stakeholders. Piloting this model of sustainability innovation, it can enter a diffusion and implementation by using the expertise and cooperation of the national level of the students´ service organization 'Studentenwerk', which is established at 58 universities in Germany. The vision of ´sustainable university´ can become real, integrating regional stakeholders in the field of sustainable nutrition. It requires a sustainability process management, dealing with open future and innovation approaches and integrating necessary expertise for specific and feasible solutions.

Piloting and implementing sustainable nutrition as regional system innovation, addresses SDG 2 'sustainable land use', in order to support regional ecological agriculture. Core to the project is SDG 3 'healthy living', as health and nutrition are in the center of this initiative. SDG 4 'Education for sustainable development' is core, as students cooperating with regional stakeholders develop sustainable and solution oriented learning and development designs. SDG 6 is supported addressing the issue, to orient 'regional agriculture towards sustainability'. SDG 8 addresses 'regional economical cycles'

and SDG 12 refers to 'sustainable consumption and sustainable production'. Regional economy cycles especially can be piloted for university towns in rural regional spaces, in order to establish a sustainable canteen and regionally connected economical cycles. SDG 17 is addressed, when the principle of 'sustainable supply in university supply and delivery chains' is applied.

The model discussed here has been designed and experimented with in 2015 and now is going to be established at a regional level between Philipps-University of Marburg and regional stakeholders. Piloting this model of sustainability innovation, it can enter a diffusion and implementation by using the expertise and cooperation of the national level of the students´ service organization 'Studentenwerk', which is established at 58 universities in Germany. The vision of ´sustainable university´ can become real, integrating regional stakeholders in the field of sustainable nutrition. It requires a sustainability process management, dealing with open future and innovation approaches and integrating necessary expertise for specific and feasible solutions.

[1,2] Philipps University of Marburg, Germany.

Whale HUB | Museum Collections and Contemporary Art to Promote Sustainability Among Higher Education

Valeria D'Ambrosio [1], Stefano Dominici [2]

Promoted by the Fondazione Cassa di Risparmio di Firenze, Whale HUB | Audience Development, Sustainability & Contemporary Art is a project curated by Valeria D'Ambrosio for the Museum of Geology and Palaeontology of the University of Florence. Realised in collaboration with the museum curators, the project aims at increasing the digital and physical visibility of the Whale Hall, recent expansion of the permanent collection focused on a fossilised whale skeleton of the Tuscan Pliocene and on the evolution of marine ecosystems. Characterised by a multimedia and immersive installation, the permanent exhibition enhances the value of the historical collections creating a fair balance between scientific research and dissemination of knowledge while dealing with the themes of environmental sustainability. In order to develop the specific target of university students between 20 and 30 years of age, Whale HUB is structured in three phases with the objective of creating an interest-based community. The first phase (September 2018) acts like a catalyst for young creative energies with the ephemeral exhibition Undersea | A Panorama of Endless Change to spread knowledge on cetaceans and on the eco-sustainability of the seas through the languages of contemporary art. Taking inspiration from the words of Rachel Carson (USA, 1907-64), scientist and writer of visionary texts on the marvellous mysteries of marine ecosystems, this phase has involved the collaboration of Tethys Institute of marine biology. This non-profit organization supports and raises awareness on sea conservation through scientific research and citizen science projects in the Pelagos Sanctuary, a protected area for marine mammals in the Northern part of the Mediterranean Sea. Three artists have participated at three expeditions to the sea for a residency in dialogue with scientists in order to produce research projects in the fields of Sound Art, Performance Art and Visual Arts. The second phase (October 2018) has involved the participation of twenty students attending four of the major Florentine higher education institutions in the creative field: Fine Arts Academy, Superior Institute for Artistic Industries, Department of Architecture of the University of Florence, and Studio Marangoni Foundation. Visits guided by museum curators followed by focus groups allowed to analyse the expectations of young audiences towards a scientific museum. The third phase (November 2018) is characterised by the creation of five mixed groups, made of four students, each one coming from a different institution. This phase actively involves the students in the production of promotional contents to be communicated outside the museum. This takes place through the launching of a competition aiming at the creation of a multimedia communicative prototype for the promotion of the Whale Hall. The winning project is implemented on museum funds and is realised thanks to the technical support of four workshops: Department of Architecture Communication Lab, Multimedia Laboratory, Nemech - New Media for Cultural Heritage and studio visits with the artists of the first phase. The prototype will be presented, together with the contemporary art projects, in the Aula Magna of the University on December 13, 2018 and then spread on the digital channels of the Museum.

[1,2] Museum of Natural History, University of Florence, Italy

Valeria D'Ambrosio (1988, lives and works between Paris and Florence)
Art historian and curator specialised in contemporary art, experimental film and cultural management. She has worked as assistant curator in museums, galleries and audio-visual archives like The Scottish National Gallery of Modern Art in Edinburgh, Pace Gallery in Beijing and Les Documents Cinématographiques in Paris where, as a film curator, she is in charge of projects for the valorisation of audio-visual heritage. One of the young curators selected for Campo16 by the Fondazione Sandretto Re Rebaudengo in Turin, she currently collaborates with the Siena Art Institute where she produces artistic projects for the valorisation of Tuscan artisanal practices through the languages of contemporary art. She is co-founder and curator at PENTA SPACE, a small exhibition space in Florence dedicated to contemporary art experimentation. Winner of the call ValoreMuseo promoted by the Fondazione Cassa di Risparmio di Firenze, she is project curator at the Museum of Natural History of the University of Florence.

Stefano Dominici is curator of geology and paleontology at the Museum of Natural History of the University of Florence, Italy. He teaches Paleontology at the Department of Earth Science and is Head of the Green Office at the same university. He has curated the permanent exhibition "Tales of a whale" on Pliocene and modern marine ecosystems of Tuscany, communicating to museum visitors the need for a sustainable management of resources. He carries out scientific research on marine paleoecology and the history of science.

Email contacts:

valeria.dambrosio1@gmail.com

stefano.dominici@unifi.it

Building a Context for Sustainable Development: Entrepreneurial Teaching Methodology at Tecnocampus

Marian Buil-Fabrega

University have an importante role on developing strategies for *the* sustainable development where locate. A fundamental role of universities is to generate entrepreneurial processes of innovation and responsible entrepreneurship, helping to build a knowledge society framed within a new model of sustainable development. The model, based in the helix model, should be developed taken into account the context where university operates. Moreover, facilities offered by universities campuses could make a difference in the benefits for all stakeholders involved in the process and model: universities, businesses, government, society and other particular ones in each university campus.

It is necessary to state that the construction of this new model requires to introduce and promote the entrepreneurial culture in university campuses which introduces entrepreneurship naturally and transversally to all university curriculum using specific methodology and facilitating an entrepreneurship program. Therefore, an entrepreneurial model based in the helix model and specific entrepreneurship programs in the academic curriculum of students are essential for higher education institutions which want to develop a new sustainable development model based on entrepreneurship.

This paper presents the entrepreneurial university model and the academic entrepreneurship itinerary which operates in TecnoCampus University College affiliated to Pompeu Fabra University. The resulting model and itinerary would be useful to anyone interested in using entrepreneurship as a key element of success in sustainable development.

Escola Superior en Ciències Socials i de l'Empresa Tecnocampus – Pompeu Fabra University, Avinguda Ernest Lluch, 32, 08302 Mataró (Barcelona), Spain

Marian Buil-Fabrega, PhD.
Escola Superior en Ciències Socials i de l'Empresa Tecnocampus – Pompeu Fabra University
Avinguda Ernest Lluch, 32, 08302 Mataró (Barcelona), Spain

Email contact:

mbuil@tecnocampus.cat

The University of São Paulo Environmental Policy: Master Plan and Pilot Projects for Pirassununga and Ribeirão Preto Campuses

Patrícia FagaIglecias Lemos [1], Tamara Maria Gomes [2]
Fernanda da Rocha Brando [3]

The University of São Paulo Resolution (USP -No 7465-11-01-2018) has established USP's Environmental Policy. Its implementation in all campuses has been achieved through the development of the Environmental Master Plan (EMP), along with the university community. In 2017, USP Pirassununga and RibeirãoPreto, both located in São Paulo state, have given rise to the EMP initial ideas by organizing working groups (WG's) covering several topics. All the WG's are protected by the resolution and are also responsible for: describing the campuses specificities; defining the general goals; elaborating local indicators and procedures for future monitoring; developing governance and management models; monitoring, evaluating and reviewing the plan. USP Pirassununga campus is 2.300 rural-orientated hectares, offering livestock, veterinary medicine and engineering degrees. On the other hand, in RibeirãoPreto there are 8 teaching unities that offer healthcare science, law, economics and financial science, natural and exact sciences, teaching training and music production degrees. There are around 200 people involved with the WG's in Pirassununga and in RibeirãoPreto, and full professors, executive technician employees and students being the principal members. It is expected that the development of the EMP helps to improve USP sustainability issues.

Keywords: Environmental Master Plan, University sustainability; Pirassununga, RibeirãoPreto.

[1] Lemos Universityof São Paulo - USP; Superintendenceof Environmental Affairs - SEA/USP; UN Global CompactCitiesProgrammeBrazil Regional Office at USP; Praça do Relógio Street, 109 – K, 3o floor, Room 309, Cidade Universitária, 05508-050 – São Paulo – SP, Brazil.

[2] Faculty of Philosophy, Sciences and Letters, Department of Biology;RibeirãoPreto - SP, Brazil.

[3] Faculty of Animal Science and FoodEngineering; Department of Biosystems Engineering; Pirassununga - São Paulo- SP, Brazil.

Prof. ***Patrícia FagaIglecias Lemos*** Holds a master, a PhD and a habilitation in Law by the Law School of the University of São Paulo (1997, 2001 e 2011, respectively). Associate Professor in the Department of Civil Law of the Law School of the University of São Paulo, where she teaches undergraduate, master, PhD and Post-doc students. Is an advisor of master and PhD students in the Program of Post-Graduation in Environmental Science of the University of São Paulo, associated to the Institute of Energy and Environment of the University of São Paulo. Vice-Coordinator of CEPED – Center for Studies on Disasters of the University of São Paulo Head of Environmental Affairs of the University of São Paulo. UN global compact Cities Programme regional Office Director of the University of São Paulo. Founding partner of Iglecias&Famá Law Firm. Author of several works, with highlight for the book Solid Waste and post-consumption civil liability, published by Editora Revista dos Tribunais, 3rd edition, 2014. Main areas of work: sustainable consumption; reverse logistics; solid waste and post- consumption civil liability; joint liability; causation of environmental harm; contaminated land; civil liability due to environmental harm; environmental compensation. Former Secretary for Environment in the State of São Paulo (2015/2016).

Prof. ***Fernanda da Rocha Brando*** Holds an undergraduate degree in Biological Sciences; a specialist degree in Environmental Management; Master´s and PhD in Science Education. Technical Advisor in Environmental Affairs/USP since 2015. Teaches in the Department of Biology at USP´s Faculty of Philosophy, Sciences and Letters in RibeirãoPreto and coordinates the Epistemology and Biology Teaching Laboratory. Participates in teaching, research and outreach projects in the area of environmental education and sustainability.

Prof. ***Tamara Maria Gomes*** Holds an undergraduate degree in Agronomic Engineering, Master and PhD in Agronomy. Teaches in the Faculty of Animal Science and Food Engineering, Department of Biosystems Engineering, University of São Paulo. Technical Advisor in Environmental Affairs/USP since july/2017. Is an advisor of master and PhD students in the Program of Post-Graduation in Agricultural Systems Engineering of the University of São Paulo, Luiz de Queiroz College of Agriculture. Has experience in Irrigation and Drainage, Agricultural Reuse and Environmental Management.

Email contacts:

patricia.iglecias@usp.br

ferbrando@ffc.usp.br

tamaragomes@usp.br

Prof. ***Susanne Maria Weber*** is professor for social, political and cultural conditions of education in international perspectives at Philipps University of Marburg, Germany. Inspired by discourse analytical and inequality theoretical as well as practice theoretical perspectives, she especially is interested in transformational learning, large group interventions, organizational change and network development. In this sense she focuses on organizational dimensions of sustainability development in regional settings and currently works on developing a discourse analytical consultancy approach for organizational and networked learning for economical cycles and regional development.

Marc-André Heidelmann currently works as project manager of the design research project 'The Sustainable Canteen' funded by the Council for sustainable development (2018-2019) at Philipps University of Marburg, Germany, department of education, research group 'Innovation – Organization – Networks'. After finishing his state exams in the disciplines of Political Sciences, Economics, German, Ethics and Philosophy in 2016, in his dissertation he empirically analyzes students' process of professionalisation in the organizational education- training program connected to the project 'greening the university canteen'. His research and teaching focuses on organizational education, professionalization, transformative Higher Education; Innovation Learning of students, professionals and regional stakeholders.

Email contacts:

susanne.maria.weber@staff

maik.beermann@bundestag.de

Wednesday, 12th December 2018

11:30-13:00 - Parallel Session

Session 3, Aula Ostensio

Envisioning Green Solutions for Reducing the Ecological Footprint of a University Campus

Chiara Genta,[1] Silvia Favaro[2], Giulia Sonetti[3]
Caterina Barioglio[4], Patrizia Lombardi[5]

This paper reports strategies toward a green campus project at Politecnico di Torino, Italy. A consumption-based study for Politecnico di Torino, a 33000 students Italian Higher Education Institution (HEI), has been developed to analyse the current EF of the main campus site. Data were collected from different departments and administrative units of the Politecnico di Torino to estimate emissions and identify the measure of the pressure exerted by the campus activities on the ecosystem. Among all initiatives to reduce the total EF, possible scenarios of avoided EF are accounted for open space along five different design layers: energy, water, landscape, food and mobility. A reduction of the 21% of the current EF can be achieved through the solutions envisaged in the green campus project along the open spaces layers. These strategies contribute to a sustainable campus using photovoltaic generation, local fruits plants, bike paths and green areas. Evidently from the scenarios is that no one-size-fits-all approach exists for all green projects in university campuses. Acting on the spaces by means of biophilic design and user-driven design requires complex considerations on university's anticipated future needs as well as a wide-ranging evaluation of the most appropriate pathways forward according to all university stakeholders, far beyond the mere accounting of avoided EF. Ultimately, universities have the opportunity to not just improve sustainability of their facilities, but to also demonstrate how the built environment can be designed to benefit both the environment and the occupants. The acknowledgment of such behavioural change effects is a question left open to further researches on methods and indicators for social impact accounting and reporting in truly sustainable university campuses.

Keywords: Ecological Footprint analysis, Higher Education, Sustainability assessment, Green Areas, Research by Design, Biophilic Design.

[1,2,3,5] Interuniversity Department of Regional & Urban Studies and Planning Politecnico di Torino and Università di Torino
Viale Mattioli, 39 10125, Turin (Italy)

[4] Department of Architecture and Design, Politecnico di Torino,
Viale Mattioli, 39 10125, Turin (Italy)

Caterina Barioglio (1985) is Assistant Professor at the Department of Architecture and Design, Politecnico di Torino. She earned a Ph.D. in History of Architecture and Urban Planning in 2016, with a dissertation carried out between Turin and Columbia University in New York City. Bridging history and design, her research and publications relate to urban regeneration processes, with a main focus on spatial effects of urban rules and socio-economic transformations. After two years of operative research at the Masterplan Team of the Politecnico di Torino, she is currently member of the interdepartmental centre Future Urban Legacy Lab.

Chiara Genta is a PhD student in "Urban and Regional development" at the Politecnico di Torino and Università di Torino. She graduated with honors in architecture at the Politecnico di Torino in 2017 with a master thesis that evaluated the ecological footprint of a university campus and proposed green strategies to reduce the environmental impact and improve wellbeing and sense of belonging of users. Since 2018, she is a chartered architect obtaining an honourable mention in the international design competition Europan14.Her main research interests are focused on sustainable urban development, urban metabolism and behavioural patterns, using inter-disciplinary research methods.

Silvia Favaro graduated with honours in Architecture Construction City at Polytechnic of Turin in 2017 with the thesis "PoliGround. The ecological footprint and scenarios for a post-carbon campus". The dissertation has received the Green Team Award and it has been selected for different conferences, including the ISDRS 2018 meeting. During her studies she spent six months at the Technische Universiteit of Eindhoven. She is actually holding a scholarship for the research project "Masterplan of Polytechnic University Campus in Turin" coordinated by professor Antonio De Rossi. Her main scientific interests include sustainable urban developments, participatory processes and the design of innovative spaces for teaching.

Patrizia Lombardi PhD, MSc, BA/MA is Deputy Rector of the Politecnico di Torino and Full Professor in Planning Evaluation and Project Appraisal. She is Chair of the Green Team Office since December 2015 and appointed Chair of the Italian Universities Network for Sustainable Development from January 2019. She is an established figure in the field of sustainable urban development evaluation and management for over 20 years, publishing widely in the subject area and coordinating, or serving as lead partner in several interdisciplinary Pan-European Projects. She has received a number of awards for excellence for her career and quality of research.

Giulia Sonetti is sustainability specialist at the Green Team of Politecnico di Torino and assistant professor of project appraisal and evaluations at the Interuniversity Department of Regional & Urban Studies and Planning (Turin, Italy), where she earned a PhD in Environment and Territory. Organiser, speaker and facilitator in several shared-science and multi-stakeholder events around Europe, she is and has been involved in the writing and implementation phases of many national, EU and international research projects about inter-transdisciplinary collaboration, university campus sustainability management, SSH-STEM integration, and socio-technical energy pathways for mission-oriented policies.

Email contacts:

caterinabarioglio@gmail.com

chiara.genta@polito.it

favaro.silvia.93@gmail.com

patrizia.lombardi@polito.it

giulia.sonetti@polito.it

Enhancing Sustainability at Campus Level. The Experience of the Italian Universities Network for Sustainable Development

Patrizia Lombardi [1] **, *Fabio Pranovi*** [2]

This paper illustrates a coordinating Italian initiative, named RUS - University Network for Sustainable Development. This was promoted by Italian universities committed to orienting their institutional activities towards integrated sustainability goals and to participating actively. RUS represents a model of good practice that aims at incentivizing collaboration between University and City, spreading social innovation locally and providing cultural stimuli for the entire national economic and production system. The activities of the network are organized around five Working Groups (WGs) focusing on cross-cutting priority themes contributing to the attainment of the Network's institutional objectives with the greatest possible involvement. The WGs are: Climate change; Education; Energy; Mobility; Waste. The paper includes the presentation of a recent survey among universities included in the RUS, highlighting peculiar characteristics of the Italian university system as well as the opportunities for other sectors of public administration, to adopt the network at grassroots level, for the enhancement of the UN 2030 Agenda Sustainable development goals.

Keywords: Higher Education, Sustainability, Network, University Campus.

[1] Politecnico di Torino
Viale Mattioli, 39 10125, Turin (Italy)

[2] Ca' Foscari University of Venice
via Torino 155, 30170 Venice (Italy)

Patrizia Lombardi PhD, MSc, BA/MA is Deputy Rector of the Politecnico di Torino and Full Professor in Planning Evaluation and Project Appraisal. She is Chair of the Green Team Office since December 2015 and appointed Chair of the Italian Universities Network for Sustainable Development from January 2019. She is an established figure in the field of sustainable urban development evaluation and management for over 20 years, publishing widely in the subject area and coordinating, or serving as lead partner in several interdisciplinary Pan-European Projects. She has received a number of awards for excellence for her career and quality of research.

Email contact:

patrizia.lombardi@polito.it

University Campuses as Town-Like Institutions: Promoting Sustainable Development in Cities Through the Water-Sensitive Urban Design Approach

Vitor Gantuss Rabêlo [1], Issa Ibrahim Berchin [2]
José Humberto Dias de Toledo [3]
José Baltazar Salgueirinho Osório de Andrade Guerra [4]

Rapid population growth and urbanization of countries' landscape are pressuring both natural and built environment. Coupled with climate change, population growth and urbanization are pressuring cities' infrastructure and carrying capacity. Among the main challenges for cities, are providing decent housing, public health, transportation, sanitation, water supply, energy supply and employment. Particularly in developing countries, cities are facing several challenges regarding water management (floods, water shortages, waste of water and sanitation), requiring effective approaches to promote sustainable water management, such as the Water-sensitive urban design (WSUD), which is the focus of this study. Therefore, the aim of this study is to understand how the WSUD approach can promote sustainability in urban areas. This study presents the WSUD approach in cities, also presenting the role of universities as town-like institutions influencing both their internal community and the communities in their surroundings, and presents a case-study. The literature indicates that governments and social agents like universities must invest in new approaches to promote sustainable development in cities, such as the WSUD to improve water management and to avoid crisis. Universities campuses provide a perfect environment for innovation, experimentation and learning, serving as role model for the city and the communities in their surroundings.

Keywords: WSUD, Water Management, Sustainable Development, Higher Education, Universities.

[1,2,3,4] Research Center for Energy Efficiency and Sustainability (Greens), at the Universidade do Sul de Santa Catarina (Unisul) - 219 Trajano, Centro, Florianópolis, Santa Catarina, Brazil.

Prof. ***José Baltazar Salgueirinho Osório de Andrade Guerra***, Dr.
Professor Permanente das Pós-Graduações e dos Mestrados em Administração e Ciências do Ambiente da Unisul.
Fellow do Cambridge Centre for Environment, Energy and Natural Resource Governance, Universidade de Cambridge.
Diretor do Centro de Desenvolvimento Sustentável (Greens), Unisul.
Diretor do Projeto BRIDGE - Building Resilience In a Dynamic Global Economy: Complexity across scales in the Brazilian Food-Water-Energy Nexus (Fundo Newton, FAPESC e RCUK).

Email contacts:

vitorgantuss@gmail.com

issaberchim@gmail.com

jose.toledo@unisul.br

baltazar.guerra@unisul.br

Sustainable Universities: a Comparison of the Ecological Footprint, Happiness and Academic Performance among Students of Different Courses

***Alves-Pinto Jr M. J.*[1], *Giannetti B. F*[2]**

Universities are environments of significant influence in people's lives, where students are trained for training and become the future leaders of society. In this sense, this work develops a way of evaluating the sustainability of university students, comparing them in different courses. The sustainability assessment is based on the input-state-output framework for systems, using three different indicators: the ecological footprint, happiness and academic performance. The ecological footprint is measured by the consumption of meat, fish, vegetables, fruits, milk and dairy products, paper, electricity, mobility and built area. Happiness has its own questionnaire, drawn from others already consolidated by the literature such as the Gallup World Poll, Gross National Happiness Index Survey-Happiness Alliance and Santa Monica Wellbeing Survey. Academic performance is assessed by the average grade of students. The three indicators are represented in a cube, graphically presenting the result of the sustainability assessment. Within the cube are presented eight ways of expressing the students' sustainability, characterizing their course. This tool can facilitate decision making by university managers.

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Finance Code 001. Special thanks to CAPES, Universidade Paulista - UNIP and the Centro Estadual de Educação Tecnológica Paula Souza - CEETEPS for financial support and research.

Keywords: Sustainable Universities, Ecological Footprint, Happiness, Academic Performance.

[1,2] Production and Enviroment Laboratory -LaProMA; universidade Paulista-UNIP, Rua Luís Góes, 2211 – Mirandópolis São Paulo-SP, CEP 04043-200 - Brazil

Marcos J. Alves Pinto has bachelor's degree in Business Administration by Fundação de Ensino Octávio Bastos (2008), a bachelor's degree in Administration by FATEC Mogi Mirim (2012), a post-graduate degree in Production Engineering by Centro Universitário Internacional - Uninter (2012), Pedagogy by Faculdade da Aldeia de Carapicuíba (2015), master's degree in Production Engineering by Universidade Federal de São Carlos - Campus Sorocaba (2016), and post-graduate studies in Teaching Higher Education by Faculdade da Aldeia de Carapicuíba (2017). He is currently a regular PhD student in the post-graduate program in Production Engineering at the Universidade Paulista – UNIP and teacher at the Centro Estadual de Educação Tecnológica Paula Souza – CEETEPS. Acted as manager of the Quality System of Delphi Automotive Systems of Brazil for the Espírito Santo do Pinhal, Jacutinga and Mococa plants. He has experience and training as Lead Auditor in ISO/TS 16949:2009 by RABQSA, Process Auditor in the VDA (German) and FIEV (French) methodology, among other training of the AIAG manuals.

Prof. ***Biagio F.Giannetti*** has Master and DSc degree by São Paulo University (USP). Uninterruptly, he has been teaching classes since 1987. In 1992, he started his career at Paulista University (UNIP) as Associate Professor. Nowadays, he is Paulista University's Full Professor. At UNIP, he has coordinated courses of degree in engineering and currently holds the positions of Professor in the Graduate Program in Production Engineering (Master, Doctorate and Postdoctoral levels) and leader of the research activities at the Production and Environment Laboratory (LaProMA). Prof. Biagio is registered as 'Research Group Leader' in the 'Research Groups Directory' of brazilian National Council for Scientific and Technological Development (CNPq). Since 1995, he has received financial support, specially from the São Paulo Research Foundation (FAPESP). Prof. Biagio founded the International Workshop on Advances in Cleaner Production (http://www.advancesincleanerproduction.net) and Advances in Cleaner Production Network and co-founded the Paulista Cleaner Production Roundtable. He has published more than 300 academic works - including books, papers and conferences - on production and environment. His H-Index on Scopus is 20 and his i10 index on Scholar Google is 42. Prof. Biagio also is subject editor of the Journal of Environmental Accounting and Management, belongs to the scientific commitee of the Journal of Cleaner Production, is guest editor of Nova Science Publisher and is Associate Editor of Scientiic Journal INGE CUC. Besides that, Prof. Biagio integrates the International Committee of Global Footprint Network for Standardization, is member of National Pollution Prevention Roundtable, belongs to International Society for the Advancement of Emergy Research, and is the Global Center Director of Advances in Cleaner Production Network

Email contact:

marcosalvesjr@yahoo.com.br

- **Campus Sustainability, Organizational Learning, and Sustainability Reporting: an Empirical Analysis.**
  Camille Washington-Ottombre, Smith College, Northampton MA, USA

- **How structures of a Green Campus promotes the development of sustainability competences. The experience of University of Bologna.**
  Gabriella Calvano, Alessandra Bonoli and Angelo Paletta, University of Bari and University of Bologna, Italy

Wednesday, 12th December 2018

Posters displayed at the Symposium

An Overview of Campus Greening Initiatives at Universities in Romania

Mihaela Sima [1], Ines Grigorescu [2], Dan Bălteanu [3]

Studies exploring campus greening in Romania are limited. However, campus greening-related activities are more theory-oriented (e.g. university courses, master programmes) than applied (e.g. recycling, research projects - not necessarily with outcomes turned into actions). Generally, sustainability topics (e.g. environmental protection, waste management, sustainable development) are largely addressed and, to some extent applied, in faculties dealing with earth sciences (e.g. geography, ecology) or technical sciences (e.g. environmental engineering). This can be explained by the traditional theoretical background of the first, and the experimental-oriented profile of the latter which supports the development of innovative technologies (green technologies). The current study attempts to: (1) identify campus greening initiatives in selected universities in Romania reflected in the university curricula, the behavioral approaches of students and teachers, the administrative actions (2) carry out empirical investigation of students/ teachers/management staff perception on campus greening (based on self-administered questionnaires) (3) detect the way campus greening initiatives are promoted/made visible and (4) identify the gaps and needs of the universities under scrutiny in terms of campus greening initiatives. Apart of being an empirical evaluation study, the current research is trying to identify gaps, raise awareness and share knowledge, as well as to provide outreach to those universities who haven't embrace campus greening initiatives yet. The overall scope is to identify the response of universities to sustainable development and campus greening through their curricula (education), behavior and concrete measures/actions.

[1,2,3] Romanian Academy, Institute of Geography
12 Dimitrie Racovita St, sector 2, 023993, Bucharest, Romania

Dr. ***Mihaela Sima*** is a senior researcher at the Institute of Geography and the coordinator of the Environment and GIS Department. Her main interests are in the field of environmental sustainability and quality with a special emphasis on evaluating the impact of human activities on the environment, as well as climate change impacts on different societal fields. Dr. Sima has been involved in several research projects on coordinating the stakeholders involvement and interaction on topics as climate change impacts, environmental sustainability, and hazard assessment.

Dr. ***Ines Grigorescu*** is a senior researcher at the Institute of Geography, Romanian Academy, Environment and GIS Department. Her research activity deals mainly with the study of man-environment relationships, integrated environmental assessment and change, community outreach activities and GIS. She attended several national and international conferences and symposia and published over 80 papers on environmental-related issues in Romania. She was involved in different national and international research projects (e.g. FP7, South Eastern Europe, Cross-Border Cooperation).

Prof. ***Dan Bălteanu*** is the Director of the Institute of Geography, Member of the Romanian Academy, and Chair of the Romanian National Committee on Global Environmental Change. He is senior researcher at the Institute of Geography, PhD supervisor and professor at University of Bucharest. His academic competences are in the field of natural hazards, land use/land cover change, environmental and climate change. He is the author and editor of over 15 volumes and more than 150 scientific paper published in national and international journals and coordinated several national and international projects in the field of environmental sciences.

Email contact:

simamik@yahoo.com

- **Adoption of standard operating procedures to improve healthcare waste management in a Higher Education and Health Research Institution**
  Maria M. Moreira and Wanda M.R.Gunther, School of Public Health, University of São Paulo, Brazil

- **UNIFAAT Solid Waste Management Plan: Education and Environmental Perception**
  Estevão Brasil Ruas Vernalha, Micheli Kowalczuk Machado and João Luiz de Moraes Hoefel, Centro Universitário UNIFAAT, São Paulo, Brazil

- **Sustainability in Higher Education: The Impact of Transformational Leadership on Followers' Innovative Outcomes. A Framework Proposal**
  Reem Al-Mansoori, Hamad Bin Khalifa University, Qatar

- **Implementation and evaluation of a didactic proposal to mitigate climate change in Higher Education**
  Pedro Vega-Marcote and Mercedes Varela-Losada, University of a Coruña and University of Vigo, Spain

- **A pragmatic framework for setting up transdisciplinary sustainability research on-campus that can make a difference**
  Griet Ceulemans, University of Leuven (KU Leuven), Belgium

- **Challenges and benefits of on-campus and off-campus sustainability research projects as an approach to education for sustainability**
  Nathal Severijns, University of Leuven (KU Leuven) , Belgium

- **BASE: a sustainable path for the University of Milano-Bicocca**
  Giacomo Magatti, Massimiliano Rossetti, Matteo Colleoni and Massimo Labra, University of Milano-Bicocca, Italy


HAW
HAMBURG


Manchester
Metropolitan
University


EUROPEAN SCHOOL
OF SUSTAINABILITY SCIENCE AND RESEARCH


iusdrp


UNIVERSITÀ
DEGLI STUDI
FIRENZE