A Living Lab Approach towards Promoting Innovation

Alexandra Emilia Fortiş
West University of Timişoara, Romania
Alexandra Petcu
West University of Timişoara, Romania

Abstract

The transformation projects developed in the context of digital education, sustainable development research and social innovation, and social entrepreneurship have turned the West University of Timişoara (WUT) into an active contributor to the Smart Specialization Strategy at local, regional, and national levels, from its previous status of a passive receiver of policy and R&D strategies. By exploiting open innovation tools integrated into entrepreneurship and aimed at relevant community research, WUT is currently actively involved in the incubation and/or acceleration of more than 200 start-ups, meant to enhance research relevance to actively promote higher technology readiness levels (TRLs) and social acceptance of research results. Building on top of three priority pillars - Digital, Green, and Well-Being, WUT has reconsidered its open innovation strategy and action plan to benefit the community, using a multistakeholder approach. In this context, the Digital & Green Living Lab, with cross-cutting priorities such as entrepreneurship and Culture and Creative Industries, focuses on meaningful transformation projects that contribute to enhanced community well-being. In this direction, important contributions were already achieved toward the digital transformation of educational programs and administrative sectors. Through its sustainable development vision, WUT acts on functional teams working in circular economy consortia, renewable energies, and environmental research.

Keywords: Living Lab; Innovation; Entrepreneurship; Research; Sustainable Development
JEL classification: I31, O00, O30, O36, Q1

Paper type: Research article
Received: 25 Mar 2022
Accepted: 25 Apr 2022

DOI: 10.54820/entrenova-2022-0016

Introduction

As the largest higher education and research centre in Western Romania, West University of Timisoara (WUT) has 11 faculties and a Teacher Training Department, offering 85 study programmes at Bachelor Level, 120 at the Master level, and 22 Doctoral Schools. 20+ study programmes are taught completely in English, French, or German. Being a comprehensive higher education institution, with around 6% (representing 1000) international students out of a total of 15000, WUT constantly strives to create a substantially authentic, interdisciplinary, and international environment for its yearly incoming cohorts of students. To this end, WUT counts around 700 academic and 400 administrative staff. WUT's long-term objectives include excellence in teaching and training, research, innovation, and technological transfer, and creating a state-of-the-art digital infrastructure for supporting the EU twin transition at the Higher Education level and beyond in the respective local, regional, and national communities. WUT Living Lab's main differentiator is within the fabric of 75+ years of academic excellence in collaboration with public and private sectors while putting citizens' well-being at the core of its projects and programmes. With 90+ laboratories and 10+ advisory boards comprising the region's most relevant public authorities, companies, SMEs, and NGOs, WUT Digital & Green Living Lab catalyses solid capabilities and know-how to generate co-creation-based innovation.

Motivation

The WUT Digital & Green Living Lab seeks to create a significant impact in increasing citizen participation in innovation processes, using digital & green transitions tools with a view to healthier communities and improved life quality. The WUT Living Lab team considers this to be a complex problem because of several aspects related to the following:

- different categories of stakeholders possibly involved (e.g., children, elderly, employees, employers, etc.);
- different levels of digital & green education abilities/skills;
- different levels of knowledge and expertise in addressing climate change action;
- interaction with largely represented & varied stakeholder groups in a complex socio-technological environment.

Through the major challenges that WUT Digital & Green Living Lab must overcome, we have identified the following:

- the need for societal education, by changing mindset and lifestyle;
- the lack of digital and/or green infrastructure facilitating respective actions;
- the lack of educational resources adapted to different levels of knowledge and/or expertise;
- different needs, standards, and expectations concerning the various stakeholders involved in the innovation processes.

The role of Living Labs in the co-creation process

The way citizens and authorities work together to address real urban issues, such as the challenges of today's urban sustainability, are discussed in (Puerari, 2018), with examples of implementation in regions of the Netherlands. A special concept of collaboration in an experimental setting is one dedicated to Urban Living Labs (ULL). They contribute to the co-creation of knowledge and solutions by conducting experiments at the regional level.

By involving users in the decision-making and governance structure, the concept of sustainability in cities can be promoted throughout the entire society. Citizens

become co-creators in the innovation process, although their level of involvement is still insufficient, as stated in several studies (Mennyet al., 2018) or (Hagy et al., 2016).

Living Labs have undergone transformational processes during the last years by introducing new methods and approaches, especially in public sector organizations. In (Haug et al., 2021) and in (Mačiulienė et al., 2020), the factors that influence the process of co-creation of public values and what are the expected results are studied.

As the concept of Living Lab evolved, it was only natural that the co-creation processes "started in being blended with the Responsible Research and Innovation approach", as exposed in (Konstantinidis et al., 2021). The multidisciplinary character of Living Labs activities, connected with the education, innovation, and research fields, represent a perfect framework for the involvement of universities and R&D institutes, with "cross-cutting and many reflect practice-based experiences" included as chapters (Filho, 2020), (Popovićet al., 2020) or (Marvinet al., 2018).

A collection of relevant business models, tools, methodologies, and tests for sustainable urban development with the implication of Living Labs is included in (Greve et al., 2021) and (Rubalcaba, Strokosch, Hansen, Røhnebæk et al., 2022).

Methodology and Approach

WUT's approach

In a national context strongly characterised by post-adherence to the European Union, the political discourse related to research and innovation has been greatly influenced by buzzwords that tend to appear in both public policy and, more intensely, in local/ regional/national strategies for the 2021-2027 programming period. Luckily, these buzzwords are, to some extent, context-relevant and connected to authentic and realistic action plans for the respective local/ regional, or national strategies and/or roadmaps. As expressed by Bernadette Bensaude-Vincent (link), with a paradigm shift vision, buzzwords like "public engagement in science" and "responsible innovation" have had prominent roles in adopting an open policy approach to embedding instruments dedicated to facilitating consensus, enhancing the attractiveness of public agendas and goals.

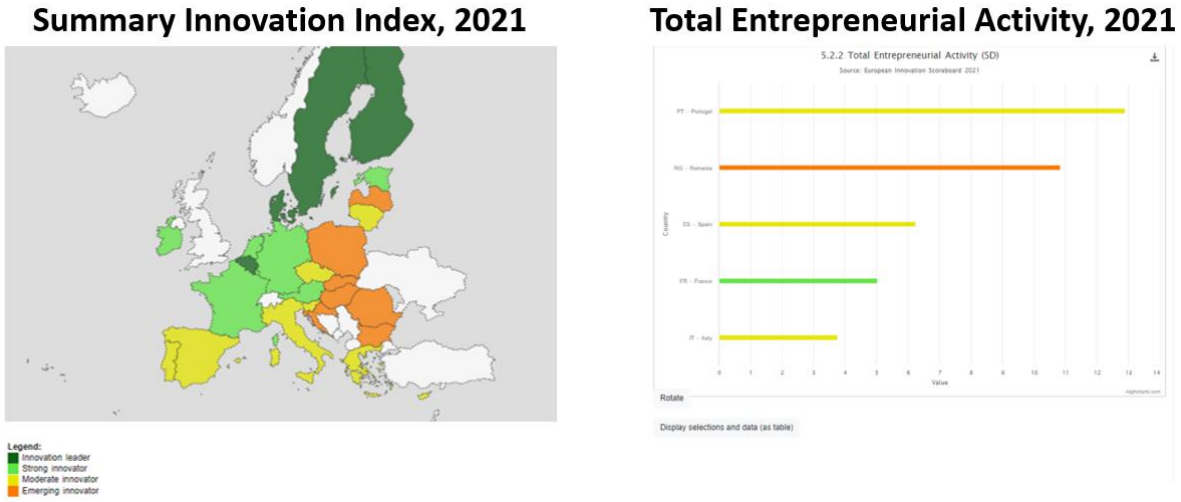
In such a context, especially when dealing with education, research, and innovation from a comprehensive HEI perspective, WUT chose to address the open innovation and public engagement topics by authentically embedding them in the institutional strategy. As opposed to creating yet another research structure, the West University of Timisoara created the Living Lab as a non-structure that sets a vision and a roadmap for the inclusion of innovation in the academic curricula and modus operandi of higher education missions. With a 16 members team dedicated to the Living Lab in a matrix management approach, the Living Lab acts agile, even if located within a typical waterfall institution.

The governance board of the Living Lab is not only academic. Still, it comprises representatives of the quadruple helix actants from the city hall, county council, regional development agency, strategic partners from the private sector, and civil society. Students of the University are invited to collaborate in challenge-based learning programmes, either mapped to disciplines in their curricula or provided with additional volunteering ECTS, depending on the learning outcomes associated with the open innovation projects they are part of.

One particular reason for WUT's interest in setting up a Living Lab to build on the previously disparate living lab actions and projects was to move further than just promoting start-up creation towards creating innovative entrepreneurship

opportunities relevant to the community. Given the University's role in boosting the regional entrepreneurship ecosystem (leading to 200+ new start-ups created between 2018-2021), the University needed to accelerate the community learning curve in embedding open innovation and authentic quadruple helix engagement. From a statistical perspective, we can see that even if Romania scores lowest in the summary innovation index (emerging innovator), it scores significantly higher when referring to entrepreneurial activity compared to more innovative European countries (Figure 1). This shows a rather effervescent entrepreneurship ecosystem, though not sufficiently connected to research results and, thus, to technologically and socially ready innovation actions.

Figure 1
Summary innovation index & Entrepreneurial Activity



Source: European Commission

Digital & Green at WUT

The main goal within the Digital pillar of WUT Living Lab is to build, extend and make use of a massive set of easy-to-access, open, inclusive, free, and/or paid informal & non-formal educational contexts and approaches, covering mainly the whole pre-university age range that will advance children within digital, high-tech STEAM-based professions and entrepreneurial activities. The network intends to continue to operate in a context described by a diverse range of high-quality STEAM-related activities and entrepreneurship education, offering various opportunities for the involvement of children and young people, both as beneficiaries and as organizers.

The areas of interest of the activities cover various areas: programming and software, electronics, communications, robotics, hardware, space science and technology, synthetic biology and biotechnology, environmental and renewable energy technologies, materials science, entrepreneurship, digital arts, assumed together with components of personal development and soft skills.

These contexts and approaches purposely focus on developing highly relevant attitudes and values, creating solid and complex individual and interpersonal skill sets, valorizing the school-based acquisitions, and massively complementing them with innovative, real-life, practical inputs. Well-defined and measurable developmental outcomes are generated through practice-oriented endeavors nested within local, regional, and global tech communities, conducted by highly

knowledgeable and dedicated mentors, including tech and education science professionals.

The general context in which we have built the Living Lab is related to the lacks and gaps that the formal educational system faces, among which we mention here: dysfunctionalities, lack of flexibility, disconnectedness (to local companies and organizations), lack of initiative, lack of creativity, reduced personal involvement, imbalanced focus on form against content, reduced capacity to operate at "soft-skills "side, incapacity to build on enthusiasm and involvement readiness, narrow focus on the key subjects, those that are part of the baccalaureate examination (e.g., Romanian language, maths), reduced capacity to build multi-school contexts (high competitiveness, low collaboration) and even reduced capacity to build multidisciplinary contexts.

Existing educational contexts face various difficulties, among which one can mention:

- Lack of funding for informal educational ecosystems targeting children's education in STEAM subjects;
- The missing integration of youth from STEAM fields of study in the community;
- Missed opportunities for higher development in talented youth;
- Reduced education during formal schooling in particular fields (e.g., Business, BioTech, Coding, Robotics, etc.);
- A lesser ability to find/discover new passions as a youth (e.g., Robotics, BioTech, Entrepreneurship, etc.);
- A lower level of parents' faith in children's readiness for the job market of the 21st century;
- Incapacity to integrate newly developed technologies into digital education, digital art, image processing, and digital content creation (blogging, vlogging, etc.);
- Artificial Intelligence in product design;
- Creating and operating new, age- and complexity-adapted inter- and multidisciplinary educational contexts;
- Creating and coordinating networks of actors and organizations involved in informal education (with a focus on the STEAM, entrepreneurial and personal development areas for professional success. By implementing the proposed educational approaches, strong, bidirectional, dynamic connections are created between the actors involved, manifested through continuous or at least frequent transfers of information, expertise, material, and financial support;
- Training of trainers (the extensive set of contexts and activities in the field of informal education in the field of technology and tech entrepreneurship carried out in Timisoara and western Romania has a real impact which, in a reasonable time and a significant number of cases, transforms beneficiaries into new educators, facilitators, initiators and managers of new educational sub-contexts, internships for assisted development of skills, and support in the development of new thematic and methodological approaches specific to informal education for different age categories);
- Promoting STEAM education and tech entrepreneurship (Individuals and communities understand and accept that technology is a force for positive

change, a tool integrated into complex projects with direct societal relevance and that technological and entrepreneurial learning is a perfect pretext for human interaction and general development;
- Supporting performance (without setting it as a goal, performance results from the effort of all actors involved leading to the creation and capitalization of models and the upward re-setting of objectives);
- Strategic alignment with society's priorities (through various activities carried out in the field of tech and entrepreneurship education are coordinated and oriented, being subject to a process of constructive reflection);
- Educational innovation (all educational models promoted and practiced are non-prescriptive, they probe wide fields of possibilities, test the most unexpected associations and constructions, approach new fields from different perspectives, generate models and recipes easy to take over and adapt by interested groups from western Romania and outside it);
- Support for the formal education system (The context and informal educational activities in the tech field aim and succeed in being a real driving force and support platform for the approaches of the classical/formal education system by facilitating access to information, content, and methodological resources, volunteers and experts, physical and thematic spaces for the involvement of students in educational activities in the STEAM area and tech entrepreneurship).

LL@WUT's setup

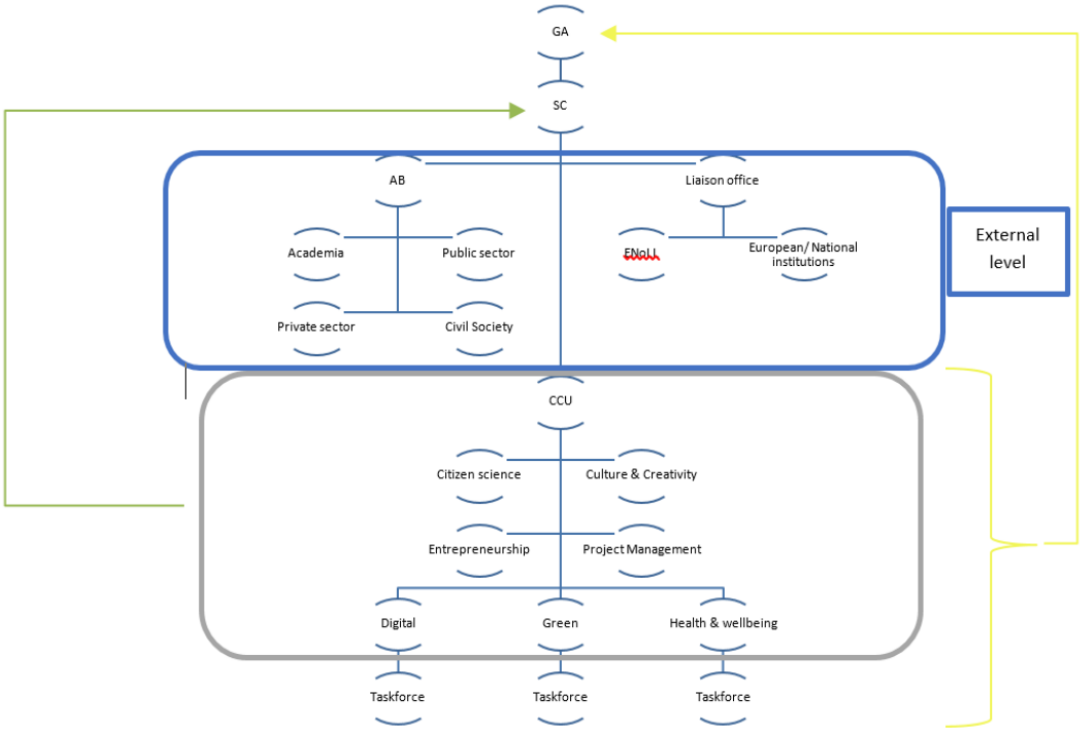
Joining the European Network of Living Labs (ENoLL) was considered an opportunity to collaborate with international stakeholders involved in facilitating the European twin transition via open innovation, with a strong focus on creating added value to civil society and the environment, as well as understanding the rationale of stakeholder engagement, in a case-by-case approach.

Another important motivation for joining ENoLL was to contribute to the transfer of knowledge generated by the University to society and the economy through innovative and co-creative approaches and methodologies.

The West University of Timisoara, as an institution, is one of the clients and utilisers of the WUT Digital & Green Living Lab. During the last year, WUT has made the exercise of reframing its institutional approach in such a way that it encompasses open innovation tools in most decision-making processes and specifically in bringing the entire community on board in redefining its sustainability strategy in a more agile approach.

The exchange of information during the co-creation sessions within the University over the past year, as well as the ones we have attended in co-creating the S3 at the local, regional, and national level, transformed the WUT Digital & Green Living Lab team into an active contributor and facilitator in properly addressing open innovation in both academic contexts, as well as systemic change within our local and regional communities, as in Figure 2.

Figure 2
WUT Digital & Green Living Lab Setup



Source: Authors' illustration

Integrating the WUT Digital & Green Living Lab in co-design processes leads to significant recognition at various levels and in several domains. We will mention some in what follows.

The Romanian Government appointed WUT as the facilitator of the Regional Sustainable Development Innovation Hub, the main contributor to the Green Transition Strategy definition and implementation at the regional level. The Hub is driven by a Living Lab approach, with a Governance Board representing all the quadruple helix stakeholders. Also, the University is part of the Advisory Council of the Timisoara City Hall in the Smart City Strategy, with the role of orchestrating open innovation and developing citizen and user-centric projects as a recognition of the four years of collaboration on the Life Quality Barometer developed, tested, and continuously adapted by the WUT working groups, after consultation processes with the civil society and active contributors from all stakeholder groups.

The West University of Timisoara is part of the Advisory Council of the Timis County Council for the use of open innovation tools in the internationalisation strategy and co-creating actions aimed at increasing the educational and business attractiveness of the county, with a focus on circular economy and cultural heritage. WUT is part of the Advisory Council of the Regional Development Agency for the co-creation of the regional Digital Innovation Hub and for the co-creation and implementation of the strategy aimed at integrating nature-based solutions in urban regeneration processes.

The University is also part of the European Urban Regenerators Knowledge Alliance, an initiative the Erasmus+ of the European Union co-funded. WUT is part of the HARMONIA consortium, co-creating a platform to support local policymakers and citizens in understanding the effects of Climate Change while providing

actionable data for smarter development strategies and co-generating opportunities for business growth and urban growth sustainability.

With a view to the 7+ years of activity in open innovation initiatives at local, regional, and national levels, the University, via the recently created Living Lab structure and dedicated team, is devoted to generating a strong impact in shifting towards a human-centric economy, focused on enhanced life quality and well-being, via actions aimed at democratising innovation and stakeholder engagement in twin transition models.

Results & Discussion

The West University of Timisoara has an extensive experience in a multitude of local, regional, national, and European projects connected to the development of (more) inclusive innovation activities/ projects/ educational programmes, both with a focus on WUT capacity building in international consortia active in participative science and open innovations and to creating social impact and improving reporting and impact measurement tools. Even in the absence of a properly defined Living Lab structure, before 2021, during the last years, WUT conducted several living lab operations, as seen in the following examples:

- Co-design and early-stage development of the first inter-university physical campus in Timisoara. The campus is now in the phase of elaboration of the Technical Documentation of the building, which will accommodate multidisciplinary research hubs in areas such as artificial intelligence, distributed computing, machine learning, sustainable agri-food models, and circular health;
- Co-design of the local and regional smart specialization strategies together with actors from the public and private sectors. WUT's contribution was not only to represent the academic perspective but also to articulate a Life Quality Barometer involving citizen science and the development of participative tools, to foster the contribution of civil society to the S3 elaboration phase & selection of funding actions based on participative budgeting exercise at the county level;
- Development of an innovative entrepreneurship ecosystem in the West region of Romania, via minimis funding schemes from EU funds, managed to provide entrepreneurial education to 2000+ citizens in the region, out of which the 200+ most promising and sustainable business plans have been awarded incubation funds and services. Out of the 200+ start-ups, at least one-third has a strong innovation component, proposing indicators and synchronization components with the smart specializations identified at the regional/national level;
- Co-design with the regional ecosystem (all quadruple helix stakeholders included, with a distinct focus on the fifth – the environment) of the National Resilience & Recovery Plan – WUT had contributions to the Green Transition pillar, the Digital Transformation, as well as the Education, Research and Innovation and Entrepreneurship ones;
- The "Blockchain Entrepreneurship" postgraduate programme curricula is a co-working result of specialists in this innovative field: researchers and specialists active in both public and private universities, experts from the public sector (banking), from business (the private company operating within the energy field) and from an R&D. Worth mention that, currently, this is the only Romanian educational programme on Blockchain technologies;
- Cluster concerning the only active Living Lab in Romania focused on Smart Cities;
- Another postgraduate programme is now being prepared, offering a very different format with an accentuated innovative profile, dedicated to the advanced specialization in programming through "Applied Web Technologies".

The mentors of this programme come exclusively, from the community, as employees of development teams of companies in our region. The program is a co-working effort with a team from WUT that will offer a legal framework and will provide access to its well-equipped laboratories, as well as expertise in configuring the curricula;

- As part of the CoderDojo national network, members of the WUT Living Lab are actively involved in co-creating educational materials, age- and language adapted to all the CoderDojo attendees. The team co-works to successfully organize camps, summer schools, competitions, and webinars each year. In this direction, there is a strong collaboration with the international network for sharing good practices and expertise. Over the past eight years, the local CoderDojo network had a rapid evolution, based on data extracted from annual reports: from 35 kids and five mentors in 2013 to 700 enrolled kids, 150 mentors, 20 active locations in Timis county, more diverse weekly workshops (the most newly introduced being related to Virtual and Augmented Reality and STEAM disciplines, including digital arts and bio-informatics);
- Provide citizens with skills to co-design and undertake environmental scientific experiments around needs and challenges in their community/household, e.g., by providing innovative, self-assembly, low-cost sensors, dynamic dashboards, and augmented reality tools for collecting, visualising, and extracting actionable intelligence from data, anyone regardless of their background, can understand their impact on the environment and explore immediate actions to improve it (circular economy education for the community, green entrepreneurship supported (start-ups, spinoffs), biodiversity actions at individual/ collective community levels, supporting a green transition, etc.), renewable energy made accessible for the individual user/consumer.

All mentioned activities are only the most recent living lab operations that were elaborated on previously implemented projects, such as:

- Train the Trainers: an Entrepreneurial education programs for WUT teachers (based on MBA curricula);
- WUT's Learning & Teaching Brand & DigiEduHack: two key methodologies towards a student-centered education approach;
- A series of non-formal education aimed at stimulating entrepreneurial discovery processes in the Western Region of Romania;
- An EIT Climate KIC Accelerator (organized in partnership with the Faculty of Economics and Business Administration-WUT and Timis Chamber of Commerce);
- "Tinerii în arena" (Youngsters in the arena – a competition like Dragons Den), Innovation Labs, and Junior Achievement Romania projects;
- UVT (WUT) Hackathon followed by UVT Entrepreneurship and Innovation Summer School and StIno - Students Innovation Challenges - challenge-based entrepreneurial programme (Open Innovation program in collaboration with companies);
- Experimentarium-TM – an innovation area open to citizens and particularly youth for promoting STEAM education with a research focus from a hands-on approach;
- CONNECTING Nature – a co-design project funded by the European Commission's Horizon 2020 Innovation Action Programme, where WUT brings an environmental psychology approach to Nature-Based Solutions adopted by front-runner and fast-follower cities
- SMARTEES - Social innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability aims to understand citizen acceptance of the

Energy Union, responsiveness to socioeconomic incentives for increased ownership and prosumerism;

- From a well-being perspective, WUT organizes the UVT Liberty Marathon. This event brings together companies, citizens, and academics, united in their willingness to provide greener and healthier mobility alternatives, education, and healthier lifestyle opportunities.

Conclusion and Future Work

WUT implements numerous research and education projects financed through EU schemes (Erasmus-mobility, cooperation, sports, etc.; H2020, various European Social Funds and European Regional Development Funds available in Romania and for cross-border cooperation) and is currently active in a European Universities project (UNITA Universitas Montium). WUT is actively connected to Smart Specialization exploration and opportunities and the Entrepreneurial Discovery Process at the regional level.

Furthermore, WUT constantly develops activities and projects in collaboration with private businesses - including multinational companies, to broaden the perspectives and opportunities for our academic community, students, teachers, researchers, and partners. Via its international partners, WUT continues to actively participate in developing digital and green solutions that provide European citizens with improved life quality and well-being via strategic transformation projects, such as, to name just one, the creation of digital structures for pan-European entrepreneurship support platforms.

The academic community of WUT, of 15000+ students and 1400+ staff, are not only members of WUT that act as hosts and clients of the WUT Digital & Green LL, but they can all be actively contributing to the co-design of collaborative projects and actions dedicated to promoting health and well-being via incremental and disruptive innovation.

The specificity of the WUT Digital & Green Living Lab is that it benefits from the support of its students as digital and green ambassadors in their communities, thus providing easily accessible testbeds for the products/services and, hence, higher levels of technological and societal maturity of the respective products and/or services. For real environments, the approach of the WUT Digital & Green Living Lab is to promote the University's infrastructure as a testbed for new products and services, followed by the urban and rural campuses of the WUT and the partners' premises for testing new solutions. Using Living Lab-specific methodologies, WUT acts as a change enabler for organisations to adopt digital and green transformation processes because of co-creation.

References

1. European Commission, "European Innovation Scoreboard 2022 and Regional Innovation Scoreboard 2021" available at: https://ec.europa.eu/research-and-innovation/en/statistics/performance-indicators/european-innovation-scoreboard/eis
2. Filho, W. L., Salvia, A. L., Pretorius, R. W., Brandli, L. L., Manolas, E., Alves, F., Paco, A. D. (2020), "Universities as Living Labs for Sustainable Development", Springer International Publishing.
3. Greve, K., Vita, R. D., Leminen, S., Westerlund, M. (2021), "Living Labs: From Niche to Mainstream Innovation Management". Sustainability, Vol.13, pp. 791.
4. Hagy, S., Morrison, G. M., Elfstrand, P. (2016), "Co-creation in Living Labs. In Living Labs", Springer International Publishing, pp.169 - 178.

5. Haug, N., Mergel, I. (2021), "Public Value Co-Creation in Living Labs—Results from Three Case Studies", Administrative Sciences, Vol.11 No.74.
6. Konstantinidis, E. I., Petsani, D., Bamidis, P. D. (2021), "Teaching university students co-creation and living lab methodologies through experiential learning activities and preparing them for RRI", Health Informatics Journal, Vol.27, pp. 146045822199120.
7. Mačiulienė, M., Skaržauskienė, A. (2020), "Sustainable urban innovations: digital co-creation in European living labs", Kybernetes, Vol.49, pp. 1969–1986.
8. Marvin, S., Bulkeley, H., Mai, L., McCormick, K., Palgan, Y. V. (2018), "Urban Living Labs". Routledge.
9. Menny, M., Palgan, Y. V., McCormick, K. (2018), "Urban Living Labs and the Role of Users in Co-Creation", GAIA - Ecological Perspectives for Science and Society, Vol.27, pp. 68–77.
10. Popović, T., Bossert, M., Bronner, U. (2020), "Transdisciplinary Living Labs in a Next Generation Context—Ecosystems for Sustainable Innovation and Entrepreneurship". In P. Planing, P. Müller, P. Dehdari, & T. Bäumer (Eds.), Innovations for Metropolitan Areas: Intelligent Solutions for Mobility, Logistics and Infrastructure designed for Citizens, Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 199–211
11. Puerari, E., de Koning, J., von Wirth, T., Karré, P., Mulder, I., Loorbach, D. (2018), "Co-Creation Dynamics in Urban Living Labs". Sustainability, Vol.10, pp. 1893.
12. Rubalcaba, L., Strokosch, K., Hansen, A. V., Røhnebæk, M., Liefooghe, C. (2022), "Insights on Value Co-Creation", Living Labs and Innovation in the Public Sector. Administrative Sciences, Vol.12 No.42.

About the authors

Alexandra Petcu, Ph.D., coordinates the Digital & Green Living Lab within WUT and is Visiting Assistant Professor at the Faculty of Economics and Business Administration (WUT). With previous experience in public policy on higher education and flexible learning paths for students with a special focus on the impact of the European Universities Initiatives towards social and innovative EEA and EHEA, she coordinates the sustainability strategy of the UNITA - Universitas Montium European University Alliance within WUT and contributes to the University's Sustainability Driven Strategy for Education, Research and Innovation. The author can be contacted at email: **alexandra.petcu@e-uvt.ro**

Alexandra Emilia Fortiş, Ph.D., is responsible for the Digital activities within Digital&Green Living Lab within WUT. She is Assistant Professor at Mathematics and Informatics Faculty (WUT), conducting disciplines in theoretical computer science and computational and applied mathematics. With expertise in managing educational projects through Erasmus+, ROSE, and POSDRU programs, she contributed to a continuous collaboration between pre-university and academia at local, regional, and international levels. She coordinates non-formal educational activities for students within the national CoderDojo network, responsible for co-creating open educational materials. The author can be contacted at email: **alexandra.fortis@e-uvt.ro**