Living Lab approaches in the context of planning

AESOP4FOOD
Action for Education Spatial Organisation and Planning For Sustainable Food

Living Labs that contribute to sustainable development
&
the competences academics need to prepation, organisation, carry out research and create impact

LIVING LAB

Reconciling individual/group interests and creating common value through collective conception

Creating ***"innovation", "openness"*** and ***"spontaneity"*** of **processes,** which generates ***"sustainable solutions"*** and ***"multiple benefits"***, while ***adding value,*** as well as ***producing "knowledge"***

LE:NOTRE Institute
Linking landscape education, research and innovative practice

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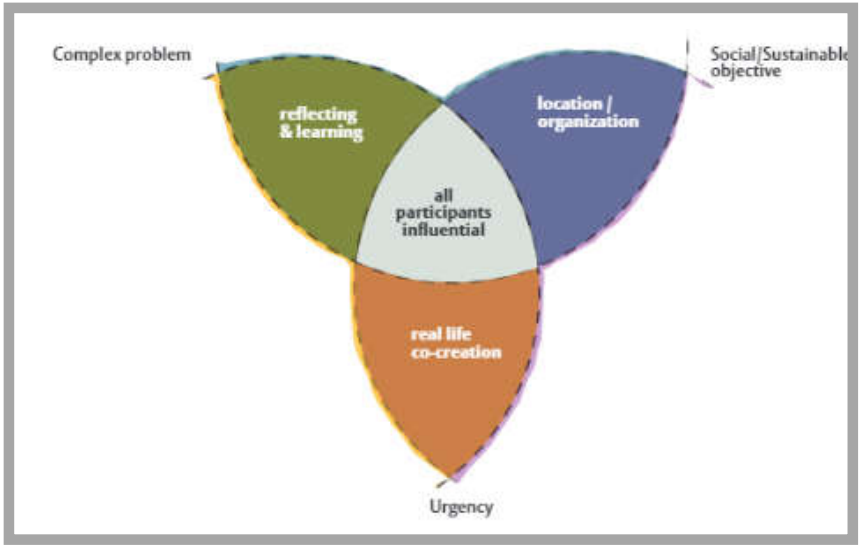
Living Lab approaches in the context of landscape planning

Part I definition, characteristics & principles

DEFINITION OF LIVING LABS

- **user-centered**, **open innovation** ***ecosystems*** based on systematic user co-creation approach, integrating research and innovation processes in real life communities and settings. (ENoLL)

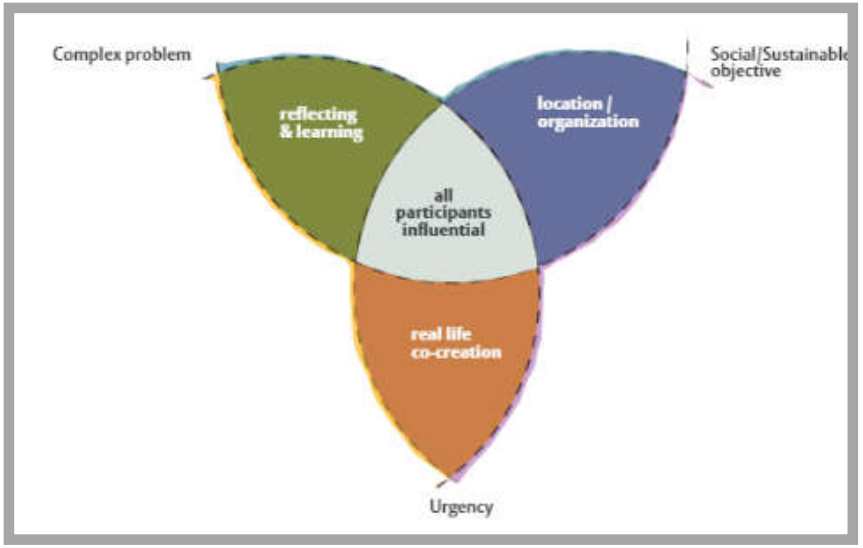
- **Innovation System** where **users** and **citizens** are ***active actors,*** not only passive receivers



Source: Verhoef &Bossert: *The University Campus as a Living Lab for Sustainability A Practitioner's Guide and Handbook*

DEFINITION OF LIVING LABS

- **A real-life setting**
  - simultaneously *encounter all relevant* ***foreseen*** and ***unforeseen circumstances***
  - *Better impact for replication and upscaling*
- in a **territorial *context*** (neighbourhood, city, agglomeration, region, campus) integrating concurrent research and innovation processes within a ***public-private-people partnership***
- based on ***change management, fast prototyping of services, co-creation*** and other *innovation management systems*
- solving complex problems in ***a multi-stakeholder context/ societal/sustainability problems*** by involving **all stakeholders** for *co-creation* and *co-production*



Source: Verhoef &Bossert: *The University Campus as a Living Lab for Sustainability A Practitioner's Guide and Handbook*

LIVING LABS CHARACTERISTICS

- ***participatory processes & stakeholder involvement***
- ***environment of innovation & creativity,*** a large number of persons in charge of design
- ***citizens at the centre of innovation:*** new concepts and solutions to answer *specific needs* and *aspirations* of **local contexts, cultures**, and **creativity potentials**
- ***partnerships*** between ***public organizations, private companies, academia,*** and ***people***
- ***researchers*** or ***experts support*** the ***end-users*** throughout the process
- *citizens, public institutions, private organizations,* and *academia* are ***engaged in all phases :*** from determinations of goals and objectives, up to the solutions, designs, and implementation
- **integrates social** and **environmental issues**, providing of inclusive spaces

Source: Lupp, G.; Zingraff-Hamed, A.; Huang, J.J.; Oen, A.; Pauleit, S. *Living Labs—A Concept for Co-Designing Nature-Based Solutions*. Sustainability 2021, 13, 188.

PRINCIPLES OF LIVING LABS

Learning and reflexivity

Learning is considered relevant for sustainability transformations in various ways. Barth and Michelsen (2013) differentiate:

1) development of individual competencies, including knowledge, capacities, and skills to per-form action;
2) social learning as collective learning process of involved actors, leading to change of understanding of these actors sparked by their interaction (Reed et al. 2010);
3) learning how to collaborate in transdisciplinary research (reflexivity), by "reflecting on the influence of actors' values, norms and epistemologies on the collaboration.

Reflexivity becomes crucial "and includes confronting, inter-relating, and integrating different epistemic cultures, values, or goals"

Source: Bergmann et all, *Transdisciplinary sustainability research in real-world labs: success factors and methods for change, Sustainability Science (2021)*

PRINCIPLES OF LIVING LABS

LLabs combine <u>transformation and transformative research</u>

Transformation research analyses dynamics and processes of change in primarily descriptive-analytical ways

Transformative research seeks to address problems of unsustainability challenges via inventing and assessing **<u>possible solutions;</u>** by creating related **actionable knowledge**, including "strategies that can solve (or mitigate) certain problems"

"to contribute to societal transformation by experimenting with potential solutions" as well as about their scalability and transferability"

The control of researchers on the intervention and their context can vary from full, external control, participatory control to no control.

Source: Bergmann et all, *Transdisciplinary sustainability research in real-world labs: success factors and methods for change, Sustainability Science (2021)*

PRINCIPLES OF LIVING LABS

Transdisciplinarity as core research approach

A core function of transdisciplinarity is to identify, differentiate and integrate relevant knowledge held by various scientific fields and societal actors to produce knowledge that can guide action.

LLabs realize **transdisciplinary research** to differentiate and integrate scientific and societal knowledge, related to a real-world problem

Transdisciplinary research

- builds on integrative and participatory processes between science and practice actors
- specialists from various disciplines work together with societal actors to understand and develop solutions for real-world problems (Lang et al. 2012).

Source: Bergmann et all, *Transdisciplinary sustainability research in real-world labs: success factors and methods for change, Sustainability Science (2021)*

PRINCIPLES OF LIVING LABS

LLabs realize **transdisciplinary research** to differentiate and integrate scientific and societal knowledge, related to a real-world problem

Involvement of societal actors : reaching “from information transfer through **consultation, cooperation, collaboration, to empowerment**”

Phases of **collaboration i**n an “ideal-type *transdisciplinary processes are (1)* **co-design, (2) co-production, (3) re-integration**

Source: Bergmann et all, *Transdisciplinary sustainability research in real-world labs: success factors and methods for change, Sustainability Science (2021)*

PRINCIPLES OF LIVING LABS

Participatory Action Research (PAR)

- **research** on the ***interface of people and place***,
- **residents** as ***integral partners in research who*** can promote democratic change
- **focuses** on ***social change*** that promotes democracy and challenges inequality;
- ***<u>context-specific</u>***, often targeted on the ***needs of a particular group;***
- **iterative cycle** of *research, action* and *reflection*;
- '***liberate' participants*** to have a greater awareness of their situation in order to act.

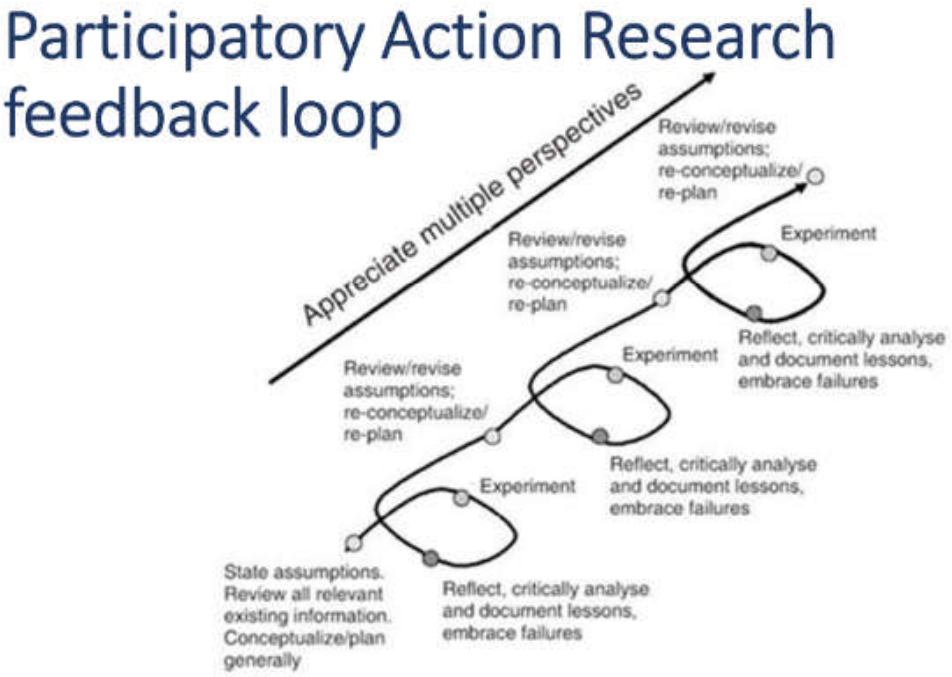


Figure 13.1 A PAR spiral, an iterative, experiential learning guide
Source: Adapted from King, 2000; Kolb, 1984.

PAR uses a range of different methods, both qualitative and quantitative.

Part II typologies & dimensions of Living Labs

TYPOLOGIES of LIVING LABS

Scale and complexity ranging from informal collaboration of two partners to an institutional organisation with a complex network of partners.

- ranging from informal collaboration of two partners

- to an institutional organisation with a complex network of partners.

Depending on the Living Lab, its setting and the environment in general it makes sense to distinguish, at a minimum, the following **stakeholder groups:** Universities and Research Institutes, NGOs, Industry and Enterprises, Local, regional, national authorities and members of the political system, Stakeholders in the natural environment of the university

Types of living labs

- **Thematic:** addressing a specific topic, e.g sustainable school environments, improving inclusiveness for climate resilient cities
- **Community centered:** formulating and addressing the needs of a community

THE DIMENSIONS OF THE LIVING LAB PROCESS

- **Co-creation**: address challenges by bringing together a diversity of views, constraints and knowledge sharing to sustain the ideation of new scenarios, concepts and related interventions.
- **Exploration:** engage all stakeholders, especially user communities, from the start of the co-creation process for discovering emerging scenarios, usage and behaviour through live scenarios in real or virtual environments

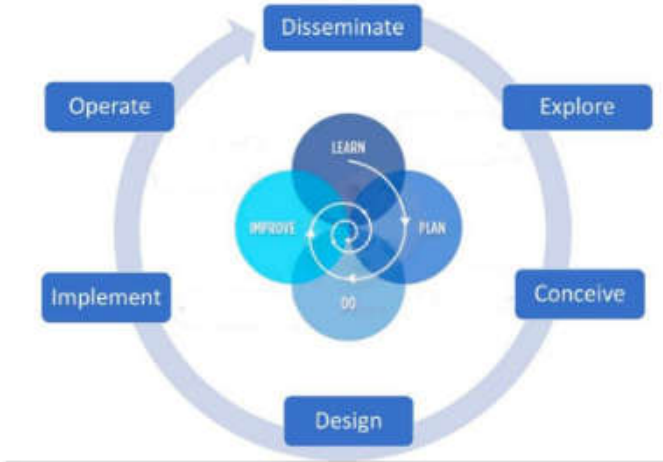


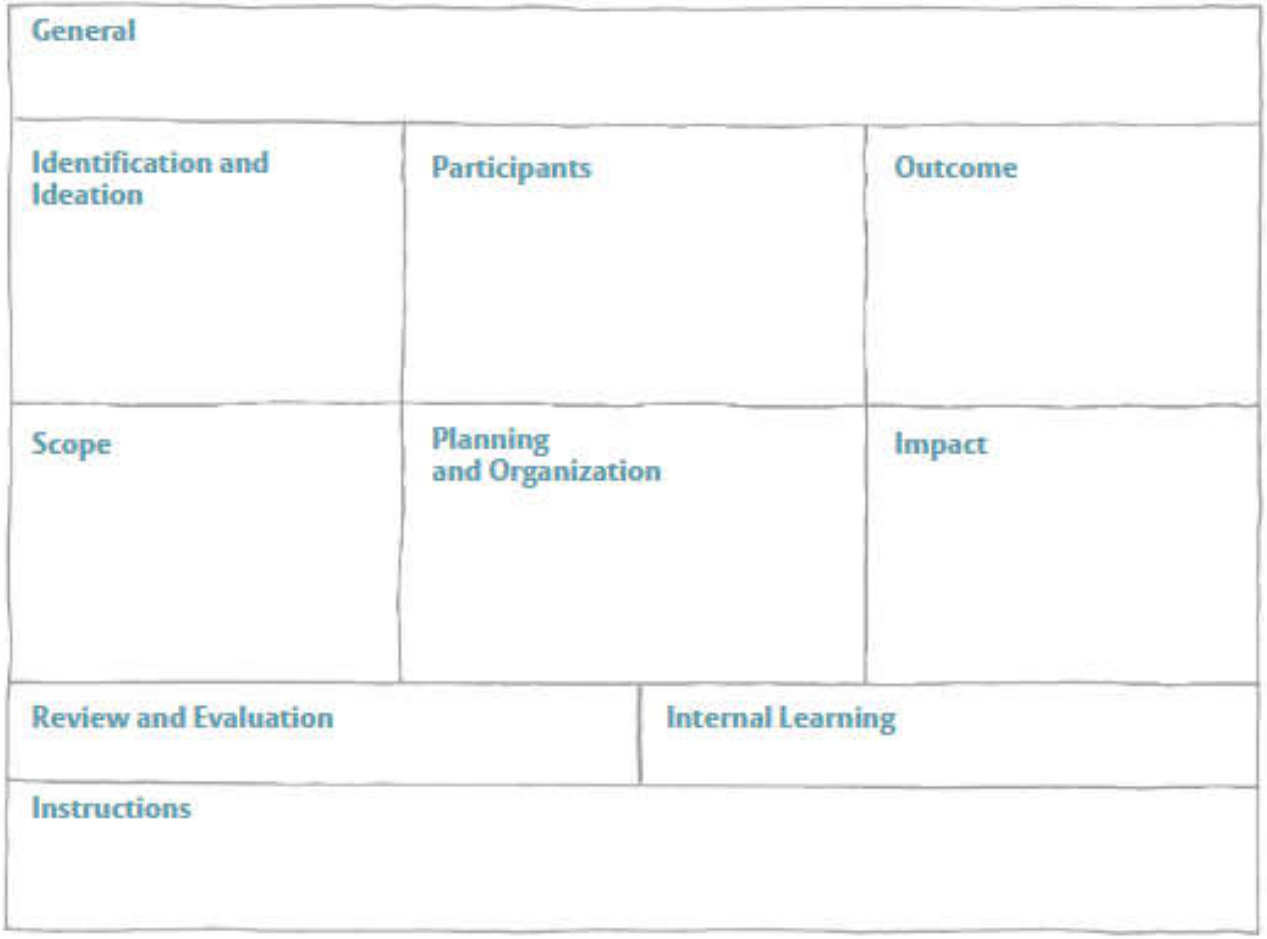
Figure 1. Proposed cyclic approach of the co-creation process by MDH Living Lab@IPR.

- **Experimentation / Prototyping:** show live scenarios and/or implement prototypes and share the experience with the community or users and organize a collaborative evaluation.
- **Evaluation:** assess new ideas and innovative concepts as well as related technical or artistic interventions in real life situations through various dimensions; make observations on the potentiality of a viral adoption of new concepts and related technological artefacts through a confrontation with users' value models.

(source: Pallot, M. et al, 2010)

Part III Launching, programming and requirements for Llabs

LAUCHING A LIVING LAB



Living Labs create value and for the value proposal a Canvas model can be used.

De Canvas model was originally designed for creating new businesses, and is now adapted to the ideas of value creation in the wider sense.

A CANVAS model for Living Labs

LAUCHING A LIVING LAB

1. **Workshops** bringing together stakeholders to get involved in the adventure and which clarify the intent and the motivations behind the choice of a Living Lab.

2. **Benchmarking** or a **review of literature** facilitating the discussion between stakeholders based on a common language.

3. **Realization of a design process** modeling the different ***strategic*** and ***operational processes*** of the Living Lab/focusing on those that support the user participation during projects of experimentation.

4. **Planning of the development** of the Living Lab:
   - align the operation with the expectations of the parties stakeholders
   - communicate the reasons (justifying certain activities outside the experimental projects)
   - develop a sustainable and trustful relationship between stakeholders

5. **Establishing a steering committee** of the Living Lab, with **terms of reference** and ***communication protocol***

❢ ***Talk about your intention within your network, compare your ideas with the initiatives local communities in open innovation.***

PROGRAMMING A LIVING LAB

Preparing and designing the Living lab organisation

3-6 months

- Stakeholder mapping
- Definition of a common intention and vision
- Cross-appropriation of concepts, processes, technologies, culture and sectoral terms
- Co-creation of project tracks and desired impacts between the stakeholders and users
- Legal status, modelling of process
- Definition of performance criteria
- Specifications of the Living Lab as an intermediary

Piloting phase, experiments, simulation and testing

6 months – 1 year

- Experimenting in a safe environment
- Experimenting of existing methods and tools
- Focusing on the design phase of the innovation process
- Assessment of existing methods and tools
- Concepts for testing the prototypes
- Simulation in realistic conditions
- Recruitment of user groups that represent well the target group

Source: adapted from Dubé et all. *Le livre blanc des Living Labs* 2014

PROGRAMMING A LIVING LAB

Implementation of the LLab innovation process

1-2 years

- Incorporation of experiments in realistic conditions
- Integration of all phases (design, prototyping, development and deployment)
- Integration of all activities (co-creation, exploration, experimenting and evaluation)
- Further development and integration of co-creative methods and tools for testing
- Further development of communities of users
- Recruitment of user groups
- Training and coaching activities

Sustainable development and adaptation of the LLab

+ 2 years

- Integration of all user experience in experiments in realistic conditions
- Development and experimenting of new methods and new tools for the Living Lab
- Implementation of the business model of the Living Lab
- Definition and additions of new Living Lab services to the community of stakeholders in terms of created value

Source: adapted from Dubé et all. *Le livre blanc des Living Labs* 2014

LIVING LAB REQUIREMENTS

Operation in Practice

- Setting up the Living Lab takes several meetings of 2 – 3 hours each
- All participants should understand and agree on desired outcomes, contributions, roles and impact for and by all
- Putting the commitment into action, requires a governing model, a project leader and a living lab manager, as well as a number of practical conditions

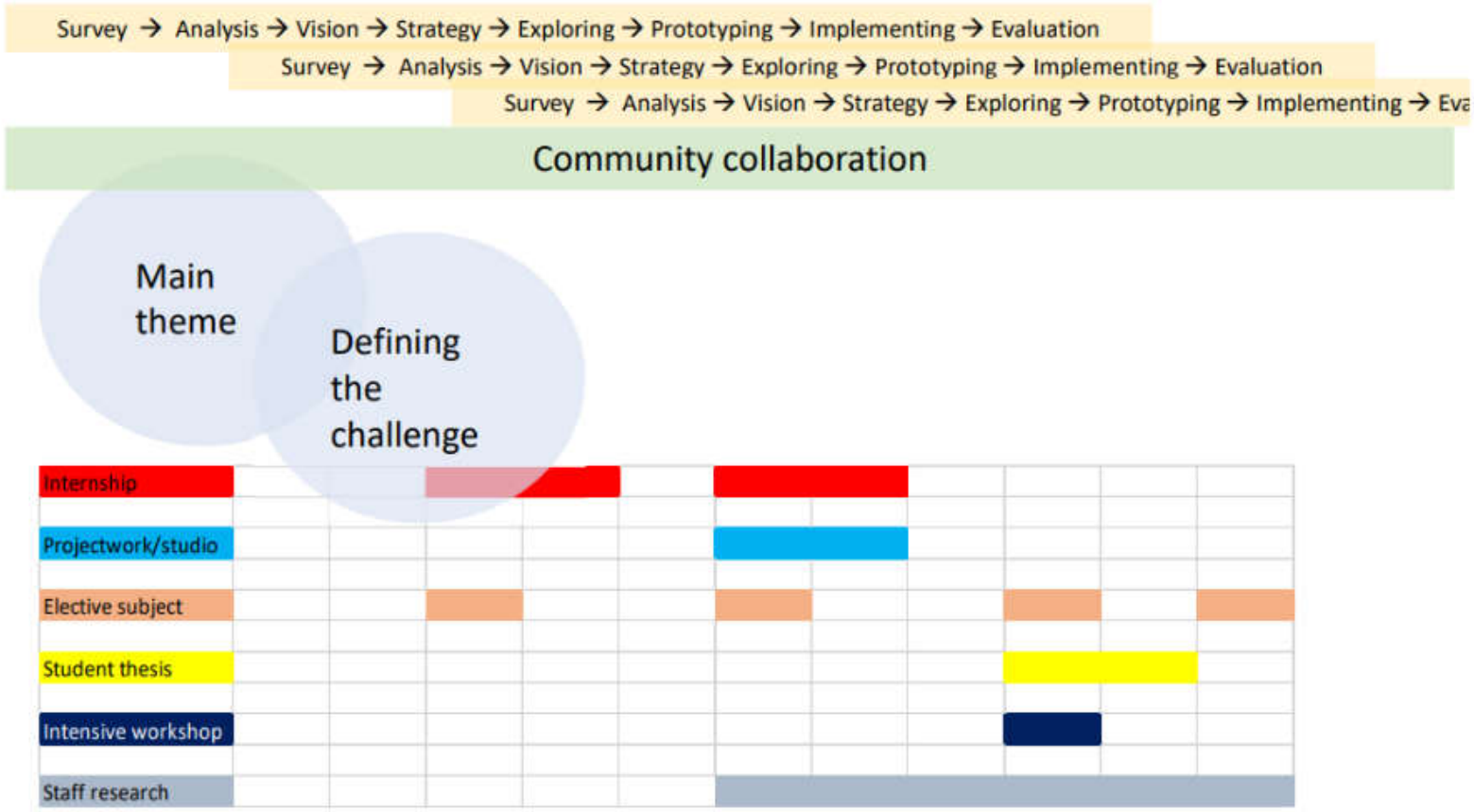
LIVING LAB REQUIREMENTS

Keeping the Lab alive

- Generate win-win situations and keep communicating results and success and the contributions of the Living Lab
- Cultivate cultures of experimentation, testing and learning together
- Match and prioritize Living Lab projects with the university profile and vision on research and education
- Respect and mobilize university stakeholders in their roles and ambitions
- Implement a positive failure culture to learn about mistakes while sharing them
- Celebrate success stories

Part IV Integration into teaching and competences of academics for Living Labs

LLABS INTEGRATION INTO TEACHING AND RESEARCH



A range of teaching, learning and research acivities can be part of a living lab

ROLE OF ACADEMICS (RESEARCHERS AND EDUCATORS)

- ***engaged partners*** and ***collaborators*** in tangible and deliberate actions aimed at ensuring the right to landscape

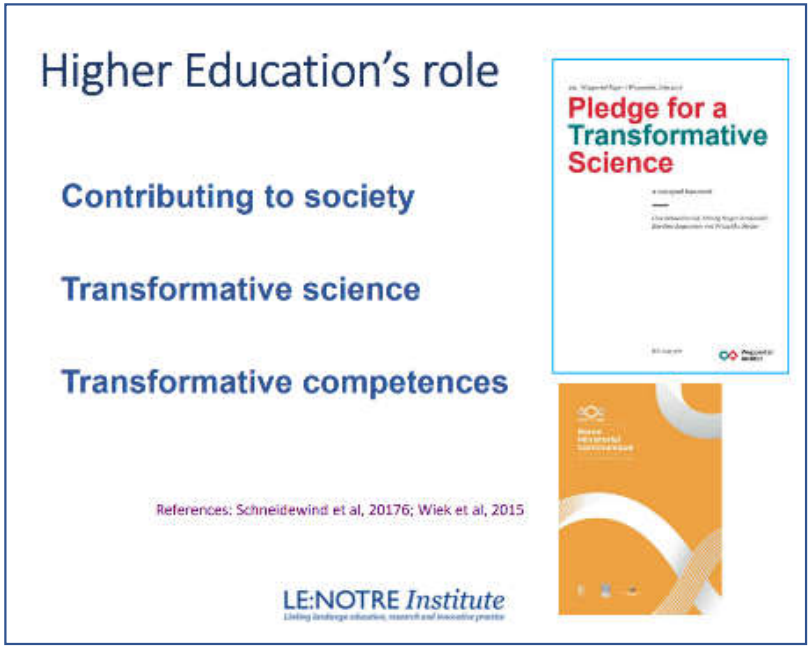
- a ***constructivist approach*** in ***education*** where ***learning is defined as a communal effort***, a ***'community of learners'*** where the ***transfer or knowledge*** and ***refinement of professional skills*** result out of the ***students' direct engagement with reality.***

Landscape transformation is a **systemic**, **wicked act** that requires **constantly monitoring** of **progress** and **learning**.

Designers and planners : 'reflection in action': assess their progress toward a goal, engage a continuous dialogue.

Students refine their ***collaborative, democratic skills***, and redefine their ***role*** as ***professionals*** and as ***citizens***.

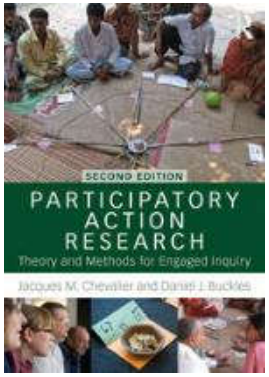
Through **partnerships** between **academics and civil society** for democratic change, it is possible to envision **transformative processes of change** that build on the ambitions and values of experts and communities alike (Schneidewind et al. 2016).



ROLE OF ACADEMICS (RESEARCHERS AND EDUCATORS)

The following criteria are proposed for validating PAR with academic rigour and possibilities for knowledge transfer.

- The validity has to be grounded in claims of **positive transformation**, ideally at **personal, professional and systemic / policy levels**.
- Criteria for validity relate to the **design, authenticity and the ability to bring about benefit** for all the participants including the academic researcher. For each aspect **evidence** needs to be reported.
- Authenticity: this manifest if the results are **recognisable** and **confirmed by the participants** in the research in terms of **mutual benefits.**
- Since the process is per definition unpredictable, part of the validation consists of showing how the project partners **adapt to change** and how they use **findings of reflections to improve** the next steps of the cycle.
- Proof needs to be presented that the **action has led** to **positive change**, in which it is clear that the **participants** have contributed to generate this proof.



J. M. Chevalier & Daniel J. Buckles, 2019. Participatory Action Research. Theory and Methods for Engaged Inquiry, Routledge

L. Wood, 2020. Participatory Action Learning and Action Research, Theory, Practice and Process, Routledge, p 119-122

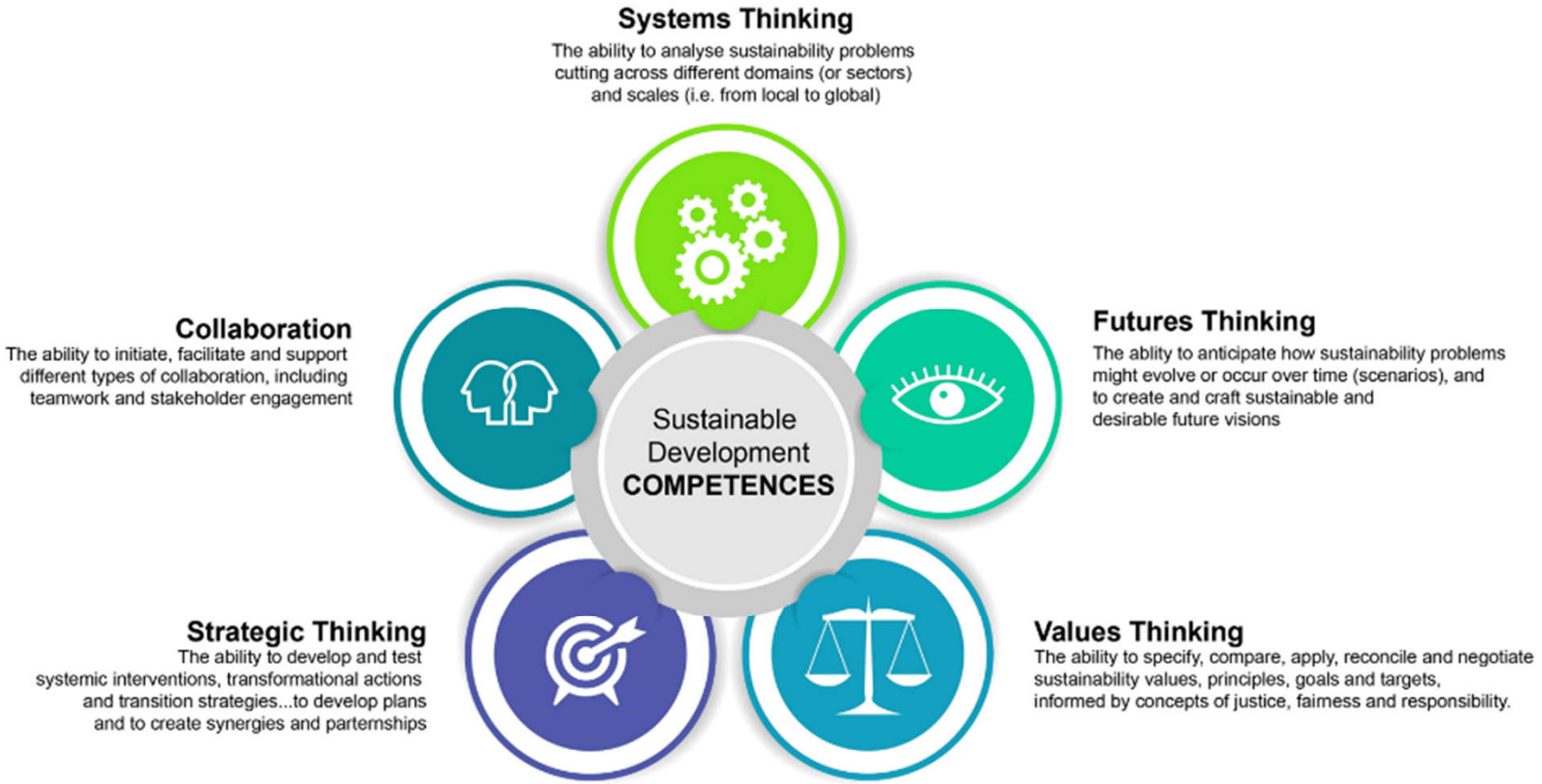
ROLE OF ACADEMICS (RESEARCHERS AND EDUCATORS)

Academics can validate the process and results of a living lab by:

- Making the research public, to open it to criticism and to make sure that the explanations are as valid as possible.
- Organise a process of social validation. For instance by a validation group of peers answering four questions:
  1. how might the researcher improve the comprehensibility of the research?
  2. Does the research provide sufficient evidence to justify the claims in the explanation? How could this be strengthened?
  3. Does it show the understanding of the socio-culture basis of the researchers and participants own values, e.g. democratic design.
  4. Is the research authentic: does the researcher takes personal responsibility and really acts upon the values that he/she claims.

Source: Video by Jack Whitehead on Supervision and Validity in Explanations of Educational Influence; https://youtu.be/Cy5UIabWaEU, consulted on 2021-12-29

COMPETENCES ELABORATED BY UNESCO



Visualiation based on the paper by Wiek, A., Bernstein, M., Foley, R., Cohen, M., Forrest, N., Kuzdas, C., Kay, B., & Withycombe Keeler, L. (2015). **Operationalising competencies in higher education for sustainable development.** In: Barth, M., Michelsen, G., Rieckmann, M., Thomas, I. (Eds.) (2015). Handbook of Higher Education for Sustainable Development. Routledge, London. pp. 241-260. | graphic based on freepik.com layout

UNESCO, 2017. Education for Sustainable Development Goals: Learning Objectives. UNESCO Education Department. Paris. ISBN 978-92-3-100209-0

Overview of academic staff competences for Living Labs

- **Getting started** – can launch and organise a living lab in various phases of development.
- **Joining forces** – can engage and motivate participants, stakeholders and academics to collaborate.
- **Social structures** – can support and carry out a methodical analysis of the community and stakeholder groups with their power structure.
- **Learning process** – can facilitate a collaborative and common learning process of all actors in the living lab.
- **Value systems** – can (help to) formulate in an inclusive way the different perspectives and value systems.
- **Vision and design**: can build a common strategy and organise the co- design and testing of proposals, prototypes, design and planning solutions
- **Organisation** – can organize, communicate the living lab with its participants and facilitate processes of negotiation differences in values and interests.
- **Sustainability** – can ensure sustainability of the living lab in the long run

Source

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Bergmann et al. 2021 Transdisciplinary sustainability research in real world labs: success factors and methods for change, Sustainability Science.

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Internet sources

Video by Jack Whitehead on **Supervision and Validity in Explanations of Educational Influence**; https://youtu.be/Cy5UIabWaEU, consulted on 2021-12-29

ANNEXES

Programming Living Labs: step by step
Successfactors for Living Labs
Tools and methods
Overview of participants

PROGRAMMING A LIVING LAB

Mapping the stakeholders

- ***Responsible*** for the initial design of the innovation to be tested and validated within the Living Lab(1 or a group)
- ***Civil society*** and ***public bodies***: they have the objective of creating value linked to experimentation or the added value that will justify the money invested. Innovation must have economic and social value;
- ***Specialists***: they come from all over the world academic, public administration or industry. They are there to advise and to give meaning to the experiments carried out in Living Lab;
- ***End users:*** the group that will benefit of created value

Matching of intentions

- Define expectations;
- Consider the end user(s);
- Maximize the knowledge sharing and results;
- Focus on the social contribution/benefits for society.

Project ideation phase:
What ideas will be tested?
• identify the ideas/concepts/projects to be tested
• identify a director for the Living Lab
• identify user communities
• identify experts involved
• adapt the support tools to each project specific

Creation of the Living Lab team
• Director in charge of group identification experts and users, having an intermediation capacity;
• Responsible for the coordination and facilitation of experimentation.

The team must actively participate in development of an experimentation strategy harmonized to meet everyone's expectations stakeholders and the specificities of each project.

Legal status of Living Lab
Organization, department or simple methodology? Whatever status is chosen, it must reflect the expectations of partners and must at least take the form of an agreement contractual, but may change during life of the Living Lab.
• Establish common ground for discussions by creating a defined legal entity.
• Select a model to ensure the stability for setting up and putting into action of the Living Lab.

Processes and tools

• Facilitate communication (blogs, wiki, cloud computing).
• Joint project management and integrated monitoring (product evolution, market criteria, etc.).
• Access to data for all partners.
• Selection / adaptation of tools to needs of the Living Lab (workshops, serious games, circles learning, etc.) to support the process co-creative.

Measures

Determine the performance indicators of the Living Lab in the dimensions:
• Awareness
• Social
• Created Value

The use of learning / codesign circles can be useful in the design of a Living Lab

Success factors

- find the right balance between scientific and societal aims, integration of scientific and societal knowledge happens through co-design, co-production and joint efforts for implementation
- address the practitioners needs and restrictions, understanding for restrictions in the work structures of involved practitioners and to consider their time constraints
- addressing relevant and timely problems or topics;
- make use of the experimentation concept,
- actively communicate,
- develop a ‘collaboration culture’,
- be attached to concrete sites,
- create lasting impact and transferability,
- defining goals that have the potential of short-term impact,
- developing products and results along existing demand by relevant actors that are highly visible and long-lasting,
- plan for sufficient time and financial means,
- adaptability,
- research-based learning,
- recognize dependency on external actors.

Success factors: relation with users and participants

Develop a lasting and meaningful relationship with users:

- motivate users by associating them with the social and human value of the project
- take the time to create common principles with the participants
- work in the long term with the communities of users to develop their skills (particularly in terms of skills with regard to information and communication technologies (ICT)
- establish and maintain a relationship of trust with users
- reassure users about the role of technology as a facilitator solution creation, which will not replace human interactions
- keep users informed about progress and results throughout the process so that they feel truly involved
- emphasize narrative approaches to communicate

TOOLS AND METHODS FOR THE LIVING LAB

Analyse and synthesize the needs of stakeholders/Explore solution scenarios:

- Workshops based on the generation of ideas
- Exposure sessions for users to various experiences related to products / services under study
- Co-creation of concepts and construction of meaning
- Tools for exploring and experimenting with ideas
- Collective idea assessment tool (learning circles, etc.)
- “Pull” market analysis (environmental, immersion, etc.)
- Benchmarking
- Semi-structured interviews with users and stakeholders
- Ethnographic observations
- Functional analysis
- Personas and models
- Fast prototyping
- Story-board
- Design games
- Role playing

PARTICIPANTS

Public-private-citizen partnerships

The Living Lab acts as an intermediation organisation.

The value created within a Living Lab lies in the ability of the latter to develop an intermediation process between stakeholders with divergent interests but common objectives in terms of innovation.

1 2

Roles of the stakeholders:

- **project initiator**
- **technology or service provider**
- **contributor to the development of innovation**
- **seeking innovative solutions**

LLabs can facilitate **individual competency** for participants especially citizen: ***anticipatory, normative*** or ***system-thinking competency***

Public

• ***Public decision-makers (***municipal level, regional or provincial) whose interest is economic development (develop innovation in the territory and encourage companies and industries) and development social (meeting the needs of citizens);

• ***Universities*** and ***research centers*** : to advance the knowledge about a subject;

• ***Public services*** (hospital, school, etc.) : to improve services offered to the public, while improving their business model.

Private

• ***Private companies*** (SMEs and suppliers technological) whose interest lies in the development of new products or services, or the provision of services technological.

Citizen

• ***Community*** and ***collective organizations citizens*** whose wish is to participate in the development of new products and services and promote the emergence of modalities democratic citizen participation.

Source: Eskelin at all: *Citizen-Driven Ionnovation- A Guidebook for City Mayors and Public Administrators* 2015

The users

1. are involved at ***all stages*** of the innovation development process.
2. hold the most ***relevant knowledge of the context*** of life in which the innovation will be deployed.
3. ***contribute to the innovation process*** in the Living Lab continuously, proactively and in the same way as the other stakeholders, who traditionally have a monopoly on development process.

The ***nature of a user's participation*** particular depends on a *number of individual* and *specific factors* (Schuurman & De Marez, 2012):

- the particular expertise of the user in terms of knowledge
- the intensity and variety of use it will make of innovation
- the expression of new needs (emphasis on ex-users)
- the user's ability to innovate and adopt quickly a product or service

Each user will therefore have a ***unique profile*** of contribution to the Living Lab and the involvement of users can be in different degrees (Decision, Information, Creation).

• It is important to properly train users in new technologies and take the time to develop their digital skills.
• It may be interesting to evaluate the development of scenarios in collaboration with users before their implementation to support future acceptance.
• A combination of ***physical and online interaction*** with users helps to reduce costs without affecting the quality of user involvement.

Recruiting users

Principles of involving users in a LLAB:

- the composition of the user group
- their recruitment
- their long-term motivation

The **user recruitment strategy** varies depending on the context of the Living Lab project:

- identification of users for the phase of start of the project ("experienced" users in the context of the use of innovation)
- identification of possible user networks, communities and “hubs” that can facilitate and support the recruitment process
- support on professional skills recruiting
- definition of recruitment methods appropriate

Direct methods:

- reception and listening structure in various configurations within communities of users: collection of needs, desires and ideas expressed by the public
- recruitment from phase to phase by going to the ***meeting users in their living environment*** (information sessions, presentation workshops)
- “***break-out events***”: co-creative events in public places (shopping centers, public transport, etc.)
- advertising in existing ***social networks*** or on a ***digital Platform*** dedicated to the project

Indirect methods:

- recruitment via a project partners
- recruitment via a personal external actor or institutional

It is essential to the validity and reliability of the process of experimentation that the group of users involved is sufficiently heterogeneous to supply the feedback development process rich and diverse

Governance

The governance of a Living Lab is determined by the ***organization that supports it***, will influence all practices allowing manage the inputs and outputs of each phase of the innovation process.

Since the Living Lab methodology is anchored in **private-public partnerships**, the Living Lab leader is often a **actor of the public domain**:

- a ***public administration***
- an ***academic institution*** or ***consortium***
- an ***industrial cluster***
- a ***public service***

It will influence:

- the degree of ***openness*** of the Living Lab to contributors who feed each of the phases (the space left to users by report to experts, for example)
- the ratio ***experimental activities /specific constraints*** (place, methodology, sequences of activities, etc.)
- the ***hierarchy*** governing the activities of the Living Lab: who decides on the performance and results to be valued
- the degree of ***sharing of benefits*** and intellectual property
- the legal structure and the choice of the management of the Living Lab.

Management team
occupies a central role in the success of activities and maintaining the ***collaboration ecosystem***.
• Representatives of all parties *stakeholders* involved, initiators and applicants ;
• *Living Lab research team* composed of research specialists action and the pair of a facilitator and of an observer making the interface between the stakeholder committee and experimental activities.

Assistant project management –
promotes know-how and expertise existing among stakeholders and is **facilitator** and **mediator** for the intervention of this team in :
• project management
• co-creative animation / field observation
• communication

Competences needed:
• mastery of digital tools and virtual interaction
• knowledge of innovation approaches technological and social
• animation of user communities
• process modelling
• management of technological projects
• management of research projects
• action and ethnographic research
• Intermediation skills