GENB
YOUNG BIOVOICES
FOR A SUSTAINABLE
FUTURE

factsheet

LIVING LAB IN ITALY FOR EARLY-SCHOOL AND ELEMENTARY SCHOOL CLASSES

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LIVING LABS ORGANIZER

APRE
Agenzia per la Promozione della Ricerca Europea

OUR CONSORTIUM

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WHAT ARE *living labs?*

Living Labs, a relatively novel concept that emerged in the early 1990s (e.g., Bajgier et al.,1991) has transformed the landscape of research and development. While there is no universally accepted definition for Living Labs, Professor William Mitchell, who is most prominently associated with Living Labs, defines them as 'a research methodology for sensing, prototyping, validating and refining complex solutions in multiple and evolving real-life contexts'. Distinguishing themselves from traditional labs, they emphasize user-centricity, experiential learning, real-life context, and co-production of knowledge through co-creation methodologies. Although the users are at the forefront of Living Labs, they usually involve heterogenous actors. Leminen (2012) describe the membership of Living Labs as the 4P partnership 'public-private-people partnerships'.

The GenB Living Labs had a clear objective: Co-creating innovative approaches, formats, materials and tools, through the cooperation between children, young adults, parents, teachers and other formal and non-formal education professionals, to provide educational and informational toolkits on bioeconomy in general and bio-based sectors.

Living Labs function in a structured process involving four main stages. While the names of these stages may vary across authors and sectors (see e.g., Ståhlbröst and Holst 2012), these stages which may be iterative depending on the context, form an essential framework for the activities of Living Labs. The GenB Living Labs adapted the stages outlined by Westerlund and Leminen (2011) and featured in the Inmédiats Handbook (Millet et al. 2014): co-creation/co-design, exploration, experimentation and evaluation.

1. **Co-creation/co-design:** This is the ideation stage. With the help of different co-creation tools and methodologies, the participants develop a portfolio of ideas aligned with their desired goals.

2. **Exploration:** With the portfolio of ideas, at this stage the participants explore the ideas in more detail and together reach a consensus on which ideas they would like to pursue. Here, the develop prototypes of the ideas or bring them to life, ready to deploy them to the target population in the next stage.

3. **Experimentation:** At this stage, the participants test the developed prototypes or products with the target population, gathering feedback and insights to evaluate their effectiveness.

4. **Evaluation:** IIn the final stage, the participants reflect on how their products were received by the target population, assessing whether they reached their intended goals. Any necessary adjustments or adaptations are identified to optimise the project's alignment with the desired outcomes.

The GenB Living Labs were implemented in the second semester of the school year 2022/2023 and specifically from March to June 2023 in Austria, Italy and Slovakia for three age groups each 4 to 8, 9 to 13 and 14 to 19. Each Living Lab was designed to have a minimum of three workshops while the pupils and young adults, together with their teachers and other actors that they decide to involve would also work on their ideas between the three workshops.

Recongnising the participants' limited prior knowledge regarding the topic of bioeconomy, the first workshop of the GenB Living Labs served as an introductory session. Its main aim was to familiarise the participants with the subject matter and its relevance to their everyday lives, all presented in a manner suitable for their age group. With a concise yet impactful approach, the session, only touched on the first stage of Living Labs, co-creation/co-design, ideation.

Nevertheless, during the period between the first and the second workshop, the participants emerged into the co-creation/co-design stage building on the knowledge acquired in the first stage. With the support of their teachers and/or with the staff involved, the children and young adults discussed the key takeaways from the first workshop and embarked brainstorming to generate project ideas for further development within the process.

The second workshop, scheduled approximately two weeks after the first, allowed participants ample time to brainstorm, while ensuring the newly acquired knowledge about bioeconomy remained fresh. Representing the second stage of the Living Labs process, exploration, the second workshop aimed to finalise the collection of ideas and narrow down the portfolio to feasible projects that could implemented by the group or in smaller teams within the given timeframe. The selected ideas were presented to the group, providing an opportunity for the rest of the participants to suggest changes. Finally, tasks were assigned, and a timeline was established.

During the period leading up to the final workshop, the participants worked in developing their ideas as intended.

The third workshop scheduled at least four weeks after the second, to provide the participants with ample time to finalise their ideas, marked two significant stages in the Living Labs process: exploration and evaluation. Firstly, the exploration stage, involved the presentation of the participants' completed projects to a larger group of their peers and/or to the target audience of their projects, if different. Secondly, after the showcase, the participants then discussed the reception of their projects and considered any necessary adjustments and also shared their experiences of the whole process, representing the evaluation stage of the Living Labs. In cases where time was limited, the evaluation phase could also extend beyond this workshop.

Although this third workshop marked the conclusion of the GenB Living Labs, within the schools or leisure centres, they are highly encouraged to consider potential for further implementation of the developed ideas as well as the integration of the bioeconomy in the future.

GENERAL CONCEPT OF *the living lab*

From March to May 2023, APRE organized two Living Labs with the "Istituto Comprensivo Guicciardini" school in Rome to co-create new educational approaches and accompany the new generation in the transition towards a circular and sustainable bioeconomy. An early school class (age 8-9 yo) and an elementary school class (age 11-12 yo) were involved. Students were highly engaged and proactive in all phases of the activities especially those which required autonomous decision-making (i.e. rules making, division in groups, roles of each group for producing the materials etc.). The Activities concluded with the presentation and dissemination of the results of the living lab (final prototype of the game) to the school community in the open school event ("Sustainability Day"). . Objectives of Living Labs in schools:

1. Co-create with students new formats for communicating the opportunities from the bioeconomy and the ecological and circular transition
2. Develop new ideas for sustainability and reduction of the environmental impact by methods creative, fun and non-formal methods
3. Children as experts e ambassadors of change and of promotion of these issues towards families and society.

ACTIVITIES *implemented*

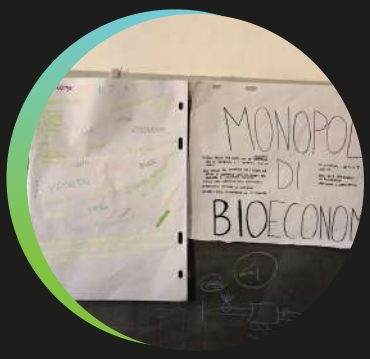
The Living Lab foresaw four phases with the engagement of teachers, students, parents, and GenB's support staff, in the ways and at the times described below. Between the Workshop phases, APRE maintained constant communication and gave clear instructions to teachers prior to each workshop. The students received homework to review and deepen concepts for the next appointment. Parents were engaged in home activities.

Co-Creation Workshop: the first workshop began with a recap and brainstorming on the bioeconomy concepts, lifestyles and sectors. Responding different questions, the students understood the bioeconomy approach and its implications in daily life. APRE staff and the class discussed answers collectively. Then the students analysed the first ideas on the educational material to produce in order to educate on the bioeconomy. APRE asked students to divide into groups and think about a type of educational instrument/material they would have liked to produce to teach also other students about the bioeconomy. The groups' ideas were presented to the class that expressed their preferences through a voting mechanism.

Exploration Workshop: in the second Workshop, the classroom worked on the development of new educational product ideas based on the proposals developed during the Co-creation Workshop. To realize the prototype, the class was divided into four groups and the students were assigned roles (i.e. Communication & design Team, Crafting materials Team and Game rules and writing Team). This phase saw the use of innovative formats: flipped classroom, inquiry-based learning, hands-on learning (production of game materials).

Experimentation Workshop: The class was divided into four groups to test and evaluate the final prototype. In particular, 1 prototype of the game was given to each group, each group had to play the game and see what worked and what did not work. APRE staff continuously supported students explaining the rules and the development, where necessary. In each section of the game, the functioning of the cards, activities and boxes was assessed and feedback or other suggestions for improvement were collected

Evaluation Workshop: in this final workshop, the results of the living lab (final prototype of the game) was presented and disseminated in an open school event ("Sustainability Day"), where parents, external bodies, institutions, were invited. The aim was to show the final output also to other students and classes, and to continue evaluate the contents and collect feedback from parents and other multipliers. Students hence take on the role of "experts" for parents, citizens and teachers themselves. Between September and December 2023, APRE will carry on implementation and valorisation activities to improve and ensure the prototype sustainability after the project life.



OVERALL *experience*

The living labs needs to be tailored to the needs, preferences and tastes of the students. In fact, all outcomes reflected the inputs coming from students both in terms of design and in terms of content creation. The final prototype of the game aims to teach the bioeconomy to other students. It is a board game for children aged 8/13 years old. The students can play with other peers or with adults (parents, teachers etc.) The objective of the game is to transform a biomass into a new bio-based product. The collection of ideas and pilot projects (co-creation and exploration phases) were successful. Students demonstrated wide creativity in thinking, suggesting ideas and the different aspects of the educational game to be produced as well as content creation. Teachers demonstrated awareness and interest on the topic of the bioeconomy and interest in being themselves "promoters" and key actors (ambassadors) of the bioeconomy, hence the objective of raising awareness for other multipliers was achieved.

THE LIVING LAB *in numbers*

Number of Living Labs organised (total):	4
Number of activities and experiments implemented (total):	7
Number of students reached (total):	81