BUILDS – BUILDING THE FUTURE

What will the city of the future look like? If we ask Hollywood, some sci-fi movies suggest we will be living in polluted megacities, travelling around in flying vehicles and staring at giant hologram billboards. And while movies like Bladerunner can cause cold shivers with their dystopian images, there are many existing projects trying to draw a more optimistic picture of the future of our cities.

A possible answer to challenges such as polluted air or undrinkable water can be found in nature itself: in "living" solutions. These approaches explore ways to overcome the problems of modern cities by using and adapting the properties of natural ecosystems. Green walls and roofs, for instance, cover parts of a building with plants and turn them into metabolic, breathing organisms. Smart and engineered applications of nature in our cities can provide sustainable, cost-efficient and flexible solutions. They can clean the air we breathe and the water we drink, provide energy and help us reduce waste.

One might ask why these solutions still sound somewhat futuristic, and indeed, many scientists study the usage and adaptation of biological and living materials, e.g. how to re-use wastewater or reduce rubbish. However, they often face a particular challenge. While researchers are experienced in their field, they might not know how to apply their investigations in a practical context, develop their findings into a product that can be commercialised or find access to funding opportunities. Eventually, this can slow down or inhibit innovation in a field where new approaches and strategies are urgently required.

What are: **Erasmus+ Knowledge Alliances?**

This initiative of the European Commission supported 2014 – 2020 158 international collaborations between partners from higher education institutions and businesses. Still, it is open to any sector and involves a wide range of stakeholders on all levels. These consortia bring their particular expertise together, amplifying innovation across their fields through collaboration by developing new and multidisciplinary teaching & learning approaches, providing entrepreneurial mindsets and relevant skills to participants, and stimulating knowledge exchange.
The fields of action are broad and include current topics such as ICT, (green) economy and sustainable energy, education, life sciences, societal challenges, etc.
In the end, the results of KAs strengthen Europe's innovation capacity in the form of novel curricula and study programs, open educational and e-learning resources, accelerators, hubs and start-ups, new products and prototypes.

The **Knowledge Alliance BUILDS – Building Urban Intelligent Living Design Solutions** – decided to present a solution to this situation. Representatives from education, science and business related to intelligent living design and eco-business were assembled for cross-sectoral cooperation. Chiara Farinea, project coordinator of BUILDs, summed it up as follows: "We thought that a transdisciplinary programme, uniting architecture, biology and business, through the use of start-ups and accelerator programmes, would be a terrific and innovative solution to this."

BUILDs managed to support innovation in the field of digital as well as green transition: unusual and efficient ways of composting through "worm hotels", easy to install moss panels to improve indoor air quality or playgrounds entirely made out of eco-materials... The range of ideas is vast – and very creative.

CONNECTING THE DOTS

The alliance consortium led by Barcelona's Institut d'Arquitectura Avançada de Catalunya consisted of eight partners, including Institutions of Higher Education, a research centre, an NGO and several SMEs to ensure that the project's goal of combining inter-disciplinarity and entrepreneurial know-how is met.

The cornerstone of this Knowledge Alliance is a newly conceptualised educational programme. It linked different disciplines and matched students, teachers, researchers and experts of biotechnology, environmental studies, design, architecture and business in project teams.

"BUILDs has offered an outstanding opportunity for students to go beyond their University silo structures, bureaucracies, and research trajectories"

After an initial introduction week, where students had the chance to meet each other and discuss possible project ideas, educators grouped them according to their interest and skills into five teams. Each group included two students of biology, architecture and business. Together, they decided collaboratively on all aspects of their project with the final goal of co-creating real and applicable products. For example, biologists presented interesting concepts and case studies; architecture students developed concepts to implement these ideas in an urban context; business students prepared corresponding business plans.

"This team diversity brought consciousness about the different lenses and perspectives of the same challenge and therefore the sensitivity to address it holistically", explains Farinea.

FROM THE LAB TO THE MARKET

This transdisciplinary course was complemented by hands-on start-up experience and entrepreneurship education from attached SMEs and an accelerator programme.

Unlike the tech industry, start-ups in the biotech sector do not have as many opportunities to obtain funding to carry out their projects. With the explicit mission of creating an accelerator, BUILDs helped the teams develop new networks, present their projects in competitions, find access to investors and eventually to funding.

Furthermore, students, scientists, staff and educators acquired entrepreneurial skills and knowledge and had the opportunity to apply these in various settings. Modern approaches to learning such as case-based cooperative learning, result-driven prototyping and experiential learning gave the students the chance to work in a real-life environment, face real-world needs and at the same time acquire relevant skills for the labour market. They tested their prototypes under actual working conditions, applied their biology concepts in situ, monitored the performance of the products and the materials used and developed apps to support the projects.

WHEN THE CURTAIN FALLS

In the long run, BUILDs fosters the normalisation of inter-disciplinarity in education and research and endows its participants with a wide variety of new skills and knowledge. What's more, this Knowledge Alliance made its contribution to mastering today's challenges, making it more probable that dystopian movies remain something we can admire in the cinema while our cities become more liveable places.

For further information on the Alliance, please consult the following links:
BUILDs official website: www.build-solutions.org
Contact: info@build-solutions.org

DIRECT IMPRESSIONS - Q&As with BUILDS and the project coordinator Chiara Farinea:

How (and at what point in your lives) did you develop the idea for BUILDs?

The idea of setting up a transdisciplinary programme came while working with our students at IAAC when developing projects that combined digital fabrication with Nature-Based Solutions. We found that it was of paramount importance to incorporate biological scientific knowledge into our designed prototypes in order to be able to effectively reintegrate nature into our urban spaces and make a real difference. Besides, another aspect that was missing in our projects was the entrepreneurial approach towards the products developed. That was the starting point of BUILDs: how can students design and develop ground-breaking nature-based solutions, using the latest technologies, which are also biologically feasible and ecologically efficient, and even more, marketable? We then thought that a transdisciplinary programme uniting architecture, biology, and business, through the use of start-ups and accelerator programmes, would be a terrific and innovative solution to this gap.

What was one of the most challenging moments of BUILDs?

BUILDs consists of a series of activities all addressed at strengthening the collaboration and interlinkages among the transdisciplinary partners (from the fields of architecture and design, biotechnology, and business) through Trainers' Workshops, the One-Year Programme, Symposiums, Intensive Courses, and others. The most challenging activity was the set-up and development of the main activity of the project: the One-Year Programme. In order to promote a transdisciplinary educational model in the face of the current societal challenges, the One-Year Programme of BUILDs was organised in such a collaborative way that it allowed 30 international students to work remotely thanks to the formation of 5 start-ups, composed of 2 students coming from each of the three HEIs (biology, design, business). By working each start-up towards the same goal (to develop ground-breaking NBS), this team diversity brought consciousness of the different lenses and perspectives of the same challenge and therefore the sensitivity to address it holistically. It offered students the opportunity to work closely with trainers from other fields, Universities, and from other countries as well as high-level coaching by experienced entrepreneurs of the green sector. This way, and by using the latest online platforms of communication and a set of regular programmed activities, BUILDs was able to create an effective comprehensive platform that allows multidisciplinary co-creation and continuous knowledge sharing across the three HEIs, with the support of the business partners.

From your point of view, how is the project contributing to the beneficiaries' real life and activities? Could you provide examples?

From a trainers' perspective, BUILDs has offered an outstanding opportunity for them to go beyond their University silo structures, bureaucracies, and research trajectories in the search of new platforms of concepts, methods, and knowledge exchange. They have been able to become familiar with other disciplines' content and, more importantly, with other learning methodologies. The result is the pioneer One-Year Programme that can serve as a successful experience for other European HEIs and business partners to encourage them to work collaboratively.

For students, being part of the One-Year Academic Programme of BUILDs entailed not only working with other students from other European Universities but also from other Schools and backgrounds. The start-up model and the accelerator programme introduced in BUILDs allowed students to put into practice such inter-disciplinarity by developing innovative nature-based solutions and products in the form of the 5 amazing start-ups: Epiclay, C:aire, aeroSQAIR, WormGeneration, and PlayEco. We are thrilled to say that a year after their formation, four of them are still up-and-running presenting their groundbreaking living solutions ideas to international events, contests and fairs and winning multiple prizes!

Which moment made you laugh a lot?

One of the activities of the BUILDs One-Year Programme was the 5-Day Intensive Workshop, during which all trainers and students gathered together in Barcelona for a week and met in person for the first time. The objective of this session was to carry out a series of activities that could allow students to get to know each others' interests in order to form the interdisciplinary groups (in the form of star-ups) that would work together during the entire Programme. The first two days of the 5-Day Intensive Workshop, dedicated to team-building activities, were particularly joyful and really funny! Intended to create a friendly atmosphere, games and interactive tasks such as the egg-drop challenge, marshmallow challenge, personality bingo, etc., were adapted to BUILDs programme and clearly showed an outstanding potential for promoting a welcoming environment that strengthened cooperation and multidisciplinarity.

And what was the most rewarding moment?

The BUILDs One-Year Programme concluded with the Final Pitch activity, where the five start-ups presented their product idea in front of an external jury. This international jury composed of renowned business experts, lawyers, and investors selected Epiclay as the most promising start-up, which won the chance of participating in the Bloxhub Accelerator Programme in Copenhagen. After that, not only has Epiclay won several prizes and contests (for instance, the first prize at the 2020 University Start-up World Cup), but also aeroSQAIR, C:aire and Worm Generation (including first and second prizes at the Entrepreneurship Avenue Conference, Climate Launchpad 2020, presented their start-ups at the Dubai Design Week, etc.). We are very proud of them all!