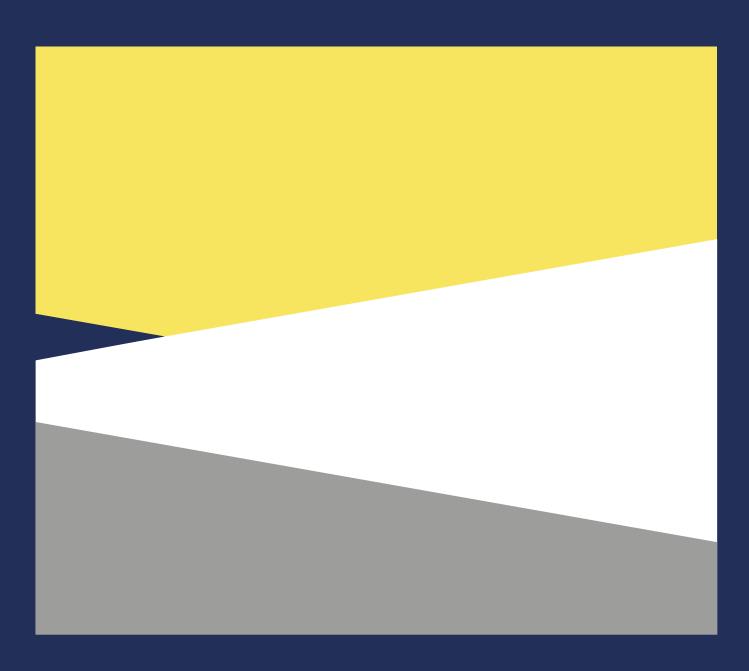
Annual report 2021-2022

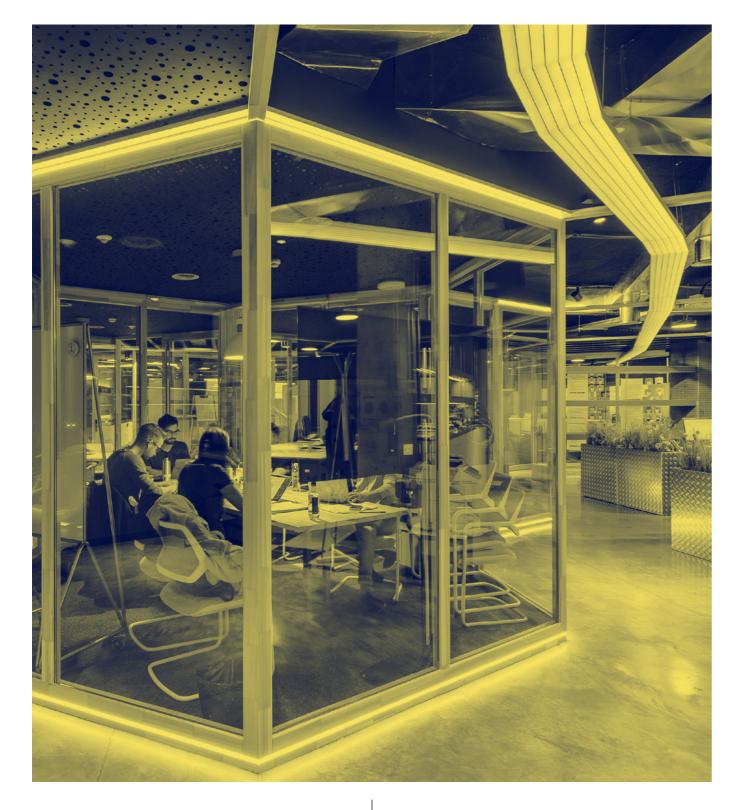
Fusion Point LAB



esade | The Rambla of Innovation

Fusion Point LAB

Where innovation begins



Fusion Point LAB
The Rambla Innovation

Av. Torre Blanca, 59 08172 Sant Cugat - Barcelona

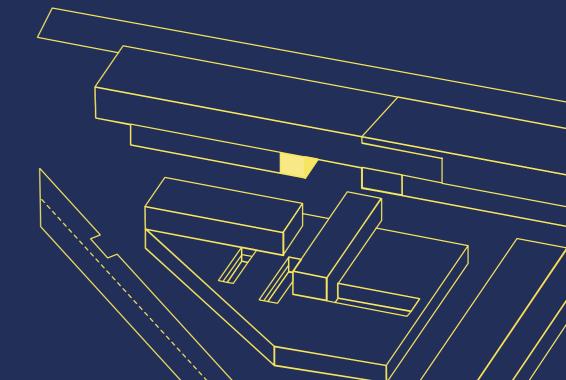
Annual report 2021-2022

In Fusion Point LAB we are prototyping the future of education. It is an experimental environment and testbed dedicated to innovation in learning.

We aim at introducing both students and the education community into processes and skills based on CIE (Creativity, Innovation and Entrepreneurship).

In the academic year 2021-2022 we have been working on:

- 1. Academic programs
- 2.Research
- 3. Outreach
- 4. Coming up in 2022-2023





These are the academic programs Fusion Point organizes:

- 1. Challenge-Based Innovation (CBI)
- 2. Technology for Social Innovation (TeSI)
- 3. Challenge-based Innovation for Artificial Intelligence (CBI4AI)
- 4. Technology for Social Innovation (TeSI) Summer Program
- 5. Creativity
- 6. Building disruptive and sustainable innovation (BDSI)
- 7. Innovation through Design Thinking (EXPAND)

ATTRACT Academy

Four of the academic programs that Fusion Point organizes are part of ATTRACT Academy. ATTRACT is an EU initiative aimed at creating a sustainable breakthrough innovation ecosystem in Europe focused on detection and imaging technologies for boosting fundamental research, industrial applications and social innovation.

ATTRACT Academy forms part of the initiative, and offers various courses over the course of 3 years, where students work together with selected research groups across Europe to find novel applications for cutting edge detection and imaging technologies.

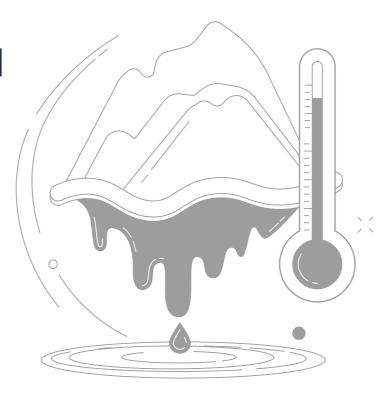
Fusion Point coordinates Esade's participation in the student programs of ATTRACT Academy, collaborating with the Universitat Politècnica de Catalunya and the Instituto Europeo di Design, TUDelft, and Laurea to form multidisciplinary teams for the programs.



1. Challenge-Based Innovation (CBI)

PART OF ATTRACT ACADEMY

The course brings together multidisciplinary student teams to tackle societal challenge in line with Sustainable Development Goals (SDGs), while leveraging the technologies and knowledge at CERN in Geneva.





Esade students: Full Time MBA



Partners:

Universitat Politècnica de Catalunya Instituto Europeo di Design



Course website:

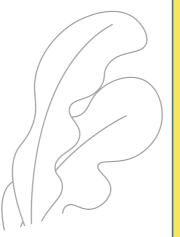
https://www.cbi-course.com/



2019 was the second warmest year on record and the warmest decade (2010–2019) ever recorded.

Carbon dioxide (CO_2) levels and other greenhouse gases in the atmosphere rose to new records in 2019.

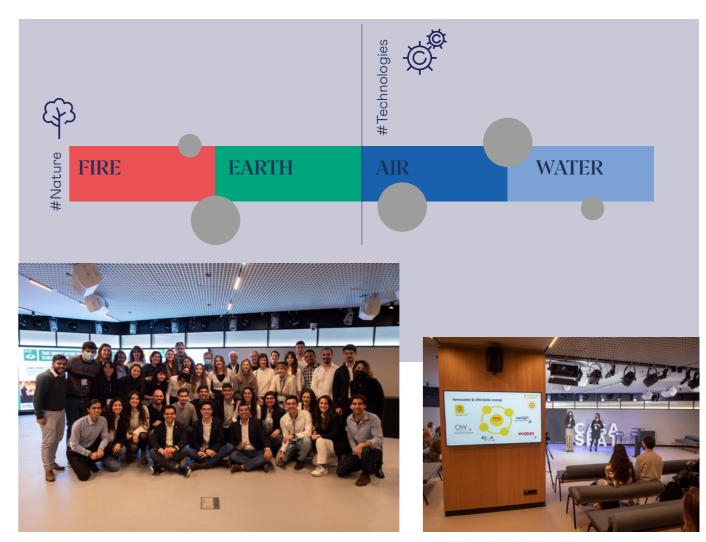
Climate change is affecting every country on every continent. It is disrupting national economies and affecting lives. weather patterns are changing, sea levels are rising, and weather events are becoming more extreme.



Aware of the process of violent transformation that our planet is experiencing through climate change, from CBI we wanted to create a community of knowledge among teachers, students, companies and experts, capable of rethinking the ways of relating with nature through design and innovative strategies, resources and processes that help to restore a healthy and balanced relationship between all the agents involved.

Each CBI team group received a real challenge directly related to some of the natural elements: earth, water, fire (energy) and air.

The CBI 2021 edition ran from January to April 2022 (the name 2021 refers to the 2021 edition that has been postponed to 2022 due to covid restrictions). It has been the last CBI edition that ran outside the ATTRACT Academy umbrella, as starting from September 2022 there will be 2 CBI editions connected to ATTRACT. This last edition addressed the Sustainable Development Goal SDG number 13, Climate Action.





2 Interdisciplinary teams per challenge

4 coaches to guide the process

Faculty from the 3 schools delivering seminars on multiple topics to help the process

Duration: 3.5 months, 15 weeks

During the academic year 2021-22, CBI focused on SDG 13: Climate Action, and more specifically on the following challenges:

Challenge 1: The Future of Forests and Forestry

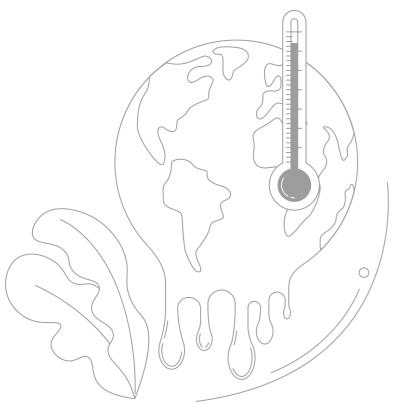
Challenge 2: Renewable and Affordable Energy

Challenge 3: Air Quality and Sustainable Mobility

Challenge 4: Greenhouse Emissions and Farming

Collaborations were driven from the commitment by companies or institutions to any of the 4 Natural points; Fire, Earth, Air or Water, as well as Technology as an operational tool in the climate crisis and its actions. These are the stakeholders that have been involved in this year's edition:







2. Technology for Social Innovation (TeSI)

PART OF ATTRACT ACADEMY

Technology for Social Innovation (TeSI) aims to identify disruptive applications and business models of cutting-edge technologies developed under the ATTRACT initiative with the overall objective of solving social needs. To form the multidisciplinary student teams, this course brought together business management students from Esade Business Schools, engineering students from the Technical University of Catalonia (UPC) and design students from Istituto Europeo Di Design (IED). As a difference from other challenge driven courses, TeSI's starting point is a subset of breakthrough technologies from the European Union's ATTRACT program.







MSc in Business

Analytics

Universitat Politècnica de Catalunya Instituto Europeo di Design









08

Student teams worked for 15 weeks with projects that were pre-selected following a user-centric design process (design thinking and lean start-up). The teams developed a new solution concept and present a proof-of-concept prototype and a business model at the end of the course to present to the Research Institutions involved.

The 2021 edition of Technology for Social Innovation (TeSI) ran from February to June.

2 Interdisciplinary teams per challenge/Research Institute

4 coaches to guide the process

Faculty from the 3 schools delivering seminars on multiple topics to help the process

Duration: 3.5 months, 15 weeks



CHALLENGE

HYSPLANT

Metabolic profiling of in vitro fertilization embryos using hyspectral imaging.



CHALLENGE

IMASENIC

Photon counting and beyond and laser imaging detection and ranging (LIDAR)



CHALLENGE

SNIFFIRDrone

Drone-based air pollution mapping for environmental monitoring and improvement of quality of life.



3.Challenge-based Innovation for Artificial Intelligence (CBI4AI)

PART OF ATTRACT ACADEMY

The Challenge-Based Innovation (CBI) is a program that originated and is grounded at CERN with the explicit goal to link CERN's open science, technologý and expertise to addressing societal challenges. CBI brought Esade, UPC and IED Barcelona together as aconsortium named Fusion Point in 2018.

In 2022, for the first year, Fusion Point put together a course that tackles Global Goals and combines breakthrough technologies from European Research Centers and knowledge in Artificial Intelligence. This course is called Challenge-Based Innovation for Artificial Intelligence (CBI4AI).

Over the course of two months, April and May 2022, students developed solutions for a challenge based on specific targets of a Sustainable Development Goal; they could explore and understand different technologies to enable breakthrough innovation for society, with a special focus on Artificial Intelligence.



MSc students



Partners:

Universitat Politècnica de Catalunya Instituto Europeo di Design Students:







10

CHALLENGE 1

Illness & health reduction

Sustainable development goal overview: Ensure healthy lives and promote well-being for all at all ages.

Attract tecnologies

SENSEI

Live, autonomous biosensor modules for environmental monitoring.



EU-RainS

Enhanced urban rain surveillance systems for smart solutions.



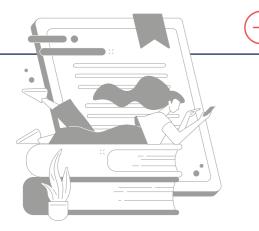
RE-SENSE

Re-designed whole-cell biosensors for environmental monitoring.



DetectiON

Rapid detection of high value pollutant ions.



CHALLENGE 2

Universal health coverage

Sustainable development goal overview: Ensure healthy lives and promote well-being for all at all ages.

Attract tecnologies

EchoBrain

The research project Echobrain aims to innovate in transcranial ultrasound (US imaging).



TOPiomics

Topological radiomics: Early detection of genetic abnormalities in cancer treatment evolution.



MULTIMAL

A point-of-care device for non-invasive multiplexed diagnosis of malaria.



MarkerSense

Surface plasmon resonance sensor technology for early detection of biomarker proteings in whole blood, in point of need settings.

SMILE

A SAW-MIP integrated device for oral cancer early detection.



CHALLENGE 3

Sustainable infrastructure

Sustainable development goal overviewBuild resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

Attract tecnologies

TACTICS

Therahertz computer tomography for plastics extrusion.



SPACC

Self-powered autonomous CMOS camera.



The Curious Cryogenic Fish

Throughout the world cryostats and dewars are used to transport and store liquid materials at very low temperatures. Those devices are often very large and can only be inspected during maintenance periods, when they are emptied.



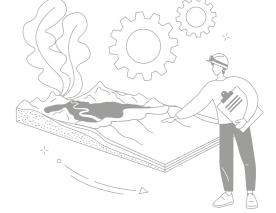
ECOTAGS

Self-triggered ecobattery tags for instant and ubiquitous event detection.









4. TeSI Summer program

PART OF ATTRACT ACADEMY

TeSI Summer School is an intensive course in which students apply human-centred design methods to identify disruptive applications and business models of cutting-edge technologies developed under the ATTRACT EU initiative with the overall objective of solving social needs. Students explore the human, the technological and the social aspects of creating sustainable business innovations.

Across 4 weeks, from 30th May till 24th June 2022, at Esade Fusion Point Barcelona, FabLab Sant Cugat (Barcelona) and CERN IdeaSquare in Geneva (Switzerland) the diverse, multidisciplinary teams learned the principles and practices of Design Thinking, Design Sprints, Digital Fabrication and Technology Transfer through practical workshops and close coaching from experts from across Europe.





The program attracted students with a range of educational and social backgrounds and could offer a richer learning experience for alumni but also to improve the quality of design and innovation outcomes, which are correlated with the diversity of life experience and voices within the team.

Students:





Partners: TU Delft (the Netherlands) Laurea (Finland)
ATTRACT Technology: Glass2Mass Glassomer GmbH |
Georges-Köhler-Allee 103 | 79110 Freiburg | Germany

5. Creativity

Creativity and creative behavior can be practiced in various situations. In this course, we focus on creativity in the context of solving managerial, organizational, or business related challenges with the aim creating innovative solutions (products, services, processes, business models, etc.). Students learn, through practice, about creative problem solving methodology.



This course is an intensive 5-week journey. The main objective is to help students develop their creative problem solving skills, as well as their ability to move from conceptual thinking to the practical steps required for initial idea implementation.

Esade students: Full Time MBA

Dates: December 2021

Total number of students: 180

Number of teams: 28, 7 per each section

Number of projects: 28

Course Faculty: Lotta Hassi, Irma Arribas

During the 5 modules of the course, student teams worked around a challenge launched by TMB Transport Metropolitans de Barcelona. As a team, students work to understand user needs and generate ideas for potential solutions to meet those needs.

Challenge formed in collaboration with TMB

Example from a group of students:





6. Building disruptive and sustainable innovation (BDSI)

Fusion Point supports the design and development of this challenge-based program where students develop tangible new solutions with a sustainable impact.

This is a course initiated and lead by Ferran Blanch. We supported the design and development of the this new challenge-based program where students develop tangible new solutions with a sustainable impact. The course aims to leverage the Innovation Rambla facilities, primarily Fusion Point and Fab Lab.

The course ran twice during academic year 2021-2022.

7 teams presented 7 different solutions to the challenge. Everyone went further with the briefing and the presentations were between good and brilliant. 5 of the 7 prototyped part of their solution.



Fall term - Sept - Nov 2021 - challenge by Eassun performance eyewear

Spring term - Feb - Abril 2022 - challenge by Santiveri

Esade students: Bachelor of Business Administration

Partners: FabLab Sant Cugat

Course Faculty: Ferran Blanch, lan Collingwood, Mat Laverne, Irma Arribas



7. Innovation through Design Thinking



Innovation through Design Thinking course is part of EXPAND, a 3-year Erasmus+ project that results in a challenge based accelerator program & toolbox for university students and teaching staff, focused on tackling major societal problems. Under the EXPAND-project collaboration, Esade together with Impact Shakers, ESSEC Business School, H-Farm, BETA-I, Glimps, espacite and Shedia, developed a challenge-based idea accelerator for social innovation.

Internally, this course brings together faculty and staff from Esade Institute for Social Innovation, Entrepreneurship Institute and Fusion Point.



Esade students:

MSc in International Management

Partners:

Impact Shakers, ESSEC Business School, H-Farm, BETA-I, Glimps, espacite and Shedia

Course Faculty:

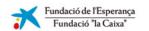
Guillermo Casasnovas, Nanita Ferrone, Ignasi Martí

Project website:

https://expandaccelerator.eu/

CHALLENGE OWNERS







Academic **Programs**

W::X

Fusion Point proposal to Esade faculty



COURSE PEDAGOGICAL DESIGN

Support in the pedagogical design of a new experiential course, or in the transformation of an already existing course to an experiential course



MULTIDISCIPLINARY EXPERIENCE

Facilitate coordination with UPC technical university and IED design school to involve engineering and design student in the course. that would enrich the student experience via the application a of specific prior knowledge in a multidisciplinary project



ACCESS TO COACHES

Facilitate contact and coordination of a pool of coaches to mentor students during the project work.



COURSE COORDINATION

In collaboration with course program manager, support in course management and coordination.



CLASS ACTIVITY LOGISTICS

Support in logistical set up of classes (whether face-to-face or virtual) and support in the development of the activity.



NETWORKING & REAL

Support in looking for real challenges from companies and NGO's.



CHALLENGE ECOSYSTEM MAPPING

Support to map the suitable experts and other stakeholders who belong to the ecosystem around a challenge (introducing systems thinking/innovation)



CHALLENGES



collaborated with

Marc Torrens

Academic Director of the Master in Business Analytics at Esade

"Fusion Point has the capacity to organize this kind of innovative courses in which we are combining students from different universities. The added value for the students in this kind of multidisciplinary projects is clearly that they are open to other ways of working."



Experiences from faculty we already

Antonio Delgado

Professor of Law and Director of Esade Legal Services

"Fusion Point is giving us this possibility to think out of the box. This environment is helping students and professors to think in a different way. This is essential for disruptive innovation"



Ferran Blanch

Academic Director of the EMMS at Esade

"I will encourage all the faculty of Esade to have an experience here because it's good for the students. They learn a lot. It's good for us. We have only to concentrate in the work and everything flows with Fusion Point"



Check out the full testimonials at this video:



Research

Fusion Point conducts experiments on the learning environments that enhance Creativity, Innovation and Entrepreneurship (CIE).

This year we worked on ongoing research projects, research articles and publications connected to the research done by Fusion Point team.



Vision Project (EU)



As part of a collaborative EU Erasmus+ Knowledge Alliance Project, VISION aims to develop vision(s) and usable guidelines for educators, trainers and coaches working at the intersection of innovation, entrepreneurship and creativity.

https://www.vision-project.org/

Envisioning the future of teaching and training for creativity, innovation and entrepreneurship

The VISION project is an Erasmus + Knowledge Alliance designed to map the future landscape of learning for Creativity, Innovation and Entrepreneurship (CIE) based on the forward-looking insights collected from 130 stakeholders interviewed across the globe.

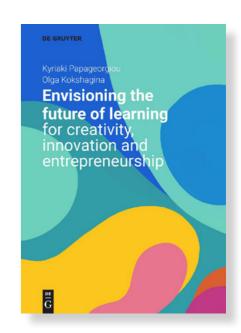
The aim is to build on the collective intelligence when it comes to the future of learning, identifying the challenges and opportunities as perceived by these experts and find examples of successful initiatives, methods or approaches currently in place and are going to be even more relevant in the near future.

By following this design-driven, iterative approach VISION project identified several critical shifts currently underway in education.

The main outputs of the research are featured in a book launched in March 2022 published by DeGruyter, as well as several academic articles and podcasts.

The book will be presented at the Research Conference held by the Design Factory Global Network at the NHL Stenden University, Leeuwarden, Netherlands on 5th and 6th October 2022.

Additional information about the project can be found at the official web: www.vision-project.org



The book is now available! Order your paperback copy, or download the free eBook here:



Experiments

Fusion Point LAB leverages its own activities to run experiments, aimed at improving these very activities. At the heart of the experimentation may be a technology, pedagogical method, network, or any other relevant aspect of the learning experiences we aim to improve.

Evaluating Learning

Can we make learning more explicit (less ambiguous) to students?

During the past academic year we've set up a systematic approach to experiment in all four courses of the ATTRACT Initiative. We've collaborated with the Esade Center for Excellence in Teaching & Learning (CTL), and in particular with Anna Inesta, to build a structured survey that would allow us to measure students' perception of learning in our courses. This ongoing project of collecting students' individual feedbacks during the courses on a weekly basis, as well as with a final feedback at the end of the course, will allow us to start measuring the impact of our courses in students lives and careers.

By iterating the same experiment in all ATTRACT courses over the course of the next academic years, we will be able to build a solid data set that will allow us to compare results and measure what students perceive they learned thanks to their participation in our courses.

Retrospective (Agile)

A Retrospective is a ceremony held at the end of each iteration in an agile project. The general purpose is to allow the team, as a group, to evaluate its past working cycle. In addition, it's an important moment to gather feedback on what went well and what did not.

In TeSI Summer School first edition, that ran in June 2022, we decided to include scheduled weekly retrospective meeting for each student team to provide time and space for reflection on their working practices. The objectives were to understand the process of running a retrospective as a means of adopting Kaizen (continuous improvement), a key aspect of the Lean Manufacturing Process, as well as experience the benefits of a regular, structured time and space to work not just in the team but on the team.

The idea behind this experiment is that by reflecting on the past week as individuals, students can solidify their learning about the methods they have employed in the course and uncover areas where they need support. as well as identify areas of improvement that they can consciously strive towards in the following week. Each team can benefit from the practice as they are able to identify areas of improvement that they can consciously strive towards in the following week.

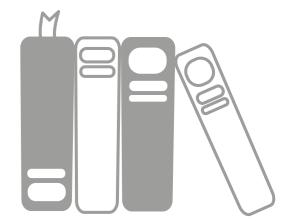
This experiment is in course during the printing of this document, therefore we will we able to report on its results and outcomes, as well as whether there will be iterations and adjustments to it in, in next year's edition.

Publications

- · Charosky, G. and Bragós, R. (2021), Investigating Students' Self-Perception of Innovation Competences in Challenge-Based and Product Development Courses, International Journal of Engineering Education Vol. 37, No. 2, pp. 461-470, 2021
- · Charosky, G., Hassi, L., Papageorgiou, K., Bragós, R. (2021), Developing Innovation Competences in Engineering Students: A Comparison of Two Approaches, European Journal of Engineering Education, 2021, 1-20, DOI: 10.1080/03043797.2021.1968347
- · Ramon Bragós, Guido Charosky, Louay Aoun, Sandra Bermejo, Josep Pegueroles. Analysis of students' performance in capstone projects according to the project features. Proceedings of the 18th International CDIO Conference, Reykjavik Iceland, June 13-15, 2022.
- Bragos, Ramon; Aoun, Louay; Charosky, Guido; Bermejo, Sandra; Rey, Francesc; Pegueroles, Josep. Correlation study between the access mark and the performance in project-based and standard subjects. The European Society for Engineering Education (SEFI) 50th Annual Conference. Barcelona, September 19-22, 2022.
- On December 9th 2021, Guido Charosky defended his PhD thesis "Developing innovation competences in engineering education through project-based and challenge-based learning", UPC, Department of Management. Co-supervised by Ramon Bragós.
- Papageorgiou, Kyriaki and Olga Kogshagina (2022) Envisioning the Future of Learning for Creativity, Innovation and Entrepreneurship. Berlin: DeGruyter.
- · Papageorgiou, Kyriaki, John Bessant and Olga Kogshagina. Designing for your Learning Future. Workshop presented at the ISPIM Innovation Conference, Copenhagen, June 5, 2011.

VISION BOOK #2 COMING SOON!

The VISION project and first book built a series of shifts and scenarios - coherent pictures of the future informed by data and discussion. The aim of the second book is elaborate that picture by putting people into the scenarios. A number of personas will be built that are versions of real people who will inhabit those futures and try to experience through their eyes, ears, touch and other feelings what it means to be in those futures. In the process we will not only explore what it means to them being in those futures but also how they got there, and how other things changed around them. What are interested in, of course, is not idle daydreaming about nice future possibilities. Futures do not just emerge, they are shaped by decisions and actions taken now. So the book explores what we need to start doing to bring our desirable futures about. The title for the forthcoming book is "The Innovation, Creativity and Entrepreneurship Training Playbook: A practical guide to facilitating learning for innovation, creativity and entrepreneurship", co-authored by John Bessant, Olga Kogshagina, and Kyriaki Papageorgiou, and published by DeGruyter.



Research



Outreach

International Design Factory Festival – October 2021

Fusion Point is part of the Design Factory Global Network, the community is extended through the five continents and different universities and research institutions are active members of the network. The main objective of the community is creating change in the world of learning and research through passion-based culture and effective problem solving.



From the 4th and the 8th of October 2021 we participated in the International Design Factory Festival, a fully digital event where many innovation hubs from the network gathered to know each other, share best practices, and plan for collaborations.

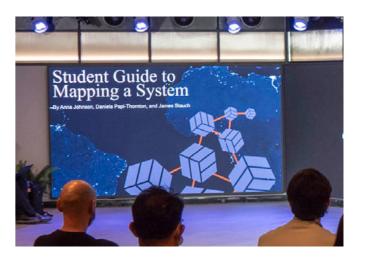
Map the System

Map the System is a global competition that challenges you to think differently about social and environmental

in our collaboration with "Map the System" Competition we introduced concepts of systems thinking and systems mapping. CBI 2021 Esade teams joined the open call of the competition this year. We invited the Esade professor Guillermo Casasnovas, teaches a BBA course called "Addressing Global complex challenges" to help students through the competition process.

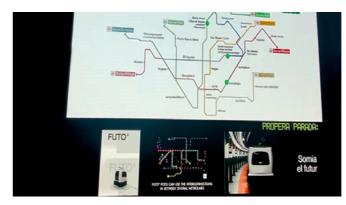
Here is more info about the competition:













Sónar Barcelona, Music Creativity & Technology -16-18 June 2022

Our partner and sponsor of the Challenge-Based Innovation (CBI) course of 2020 participated in Sónar and presented a video showing the prototypes of the two solutions generated by our students teams during the 2020 edition of the course.



Outreach 25 Outreach

Stakeholders ecosystem

Fusion Point collaborates with a variety of companies, non-for-profit organizations or public authorities sponsoring the challenges our courses address. For the courses we organize we have collaborated with the following stakeholders:

III:: Fusion Point



We collected testimonials from companies' experiences collaborating with Fusion Point. You can check it out here, from Esade youtube channel.

Coming up next year 2022-2023

CUPRA Gamified Car, the Rambla of Innovation Open Challenge

New pedagogical & technical resources



CUPRA Gamified Car

The Rambla of Innovation Open Challenge (Sept-Nov 2022)



In the first part of the project, CITM UPC selected students will tackle audiovisuals and gaming solutions for the CupraGamified Car Project, and in the second phase, Esade students will participate in an open challenge coordinated by Fusion Point.

The proposal is to create a tailor-made Accelerator Program to identify and support high-growth ideas and enhance the efficient development of entrepreneurial projects.

Participants will be Esade and EINA students (business & design), to define and present a business plan coming up from the ideas generated and presented from CITM.

The program will run from mid September until end of November 2022.



10 weeks

5 Interdisciplinary teams (3-4 students each)

5 coaches to guide the process

- Collaboration with Esade Entrepreneurship Institute delivering the content sessions & seminars
- Final prize: trip to Silicon Valley for the winning team & 3000€ for the winning student association





New pedagogical & technical resources

Synergies with new Esade VR lab

Esade plans to develop a new VR lab inside its library facilities that features VR technology to support Esade courses giving the opportunity to its students to work the course content from an empathy perspective. The new technology at disposal will be available to be integrated in future Fusion Point courses and offers a three level service to the courses:

- It can be used as complementary course material
- 2. It will allow students to work on their soft skills
- 3. It will increase students' awareness of the course content providing an immersive experience

For example, students from the previously mentioned Innovation through Design Thinking course of EXPAND project course will be able to witness the experience of eviction via VR glasses.

Collaboration with Esade HR department

Together with Innovation Rambla and thanks to its Director Montse Jimenez, Fusion Point has participated in a working session with Esade HR Department to brainstorm on future opportunities of collaboration to support the continuous development of people working in Esade.

Revamp of In-Fusion technical facility

In collaboration with the Esade Center for Excellence in Teaching & Learning (CTL), Fusion Point is redesigning its main room equipment from a technical perspective, to improve its connectivity and open new possibilities in the digital sphere to be officially announced in the upcoming academic year.



Coming up next year 2022-2023

28

Coming up next year 2022-2023





Fusion Point LAB team



Lotta Hassi



Laura Bellorini



Imma Rueda



Sonia Navarro



Montse Jimenez



Mireia Sierra



Kyriaki Papageorgiou



Ian Collingwood



Nanita Ferrone



esade

III:: Fusion Point