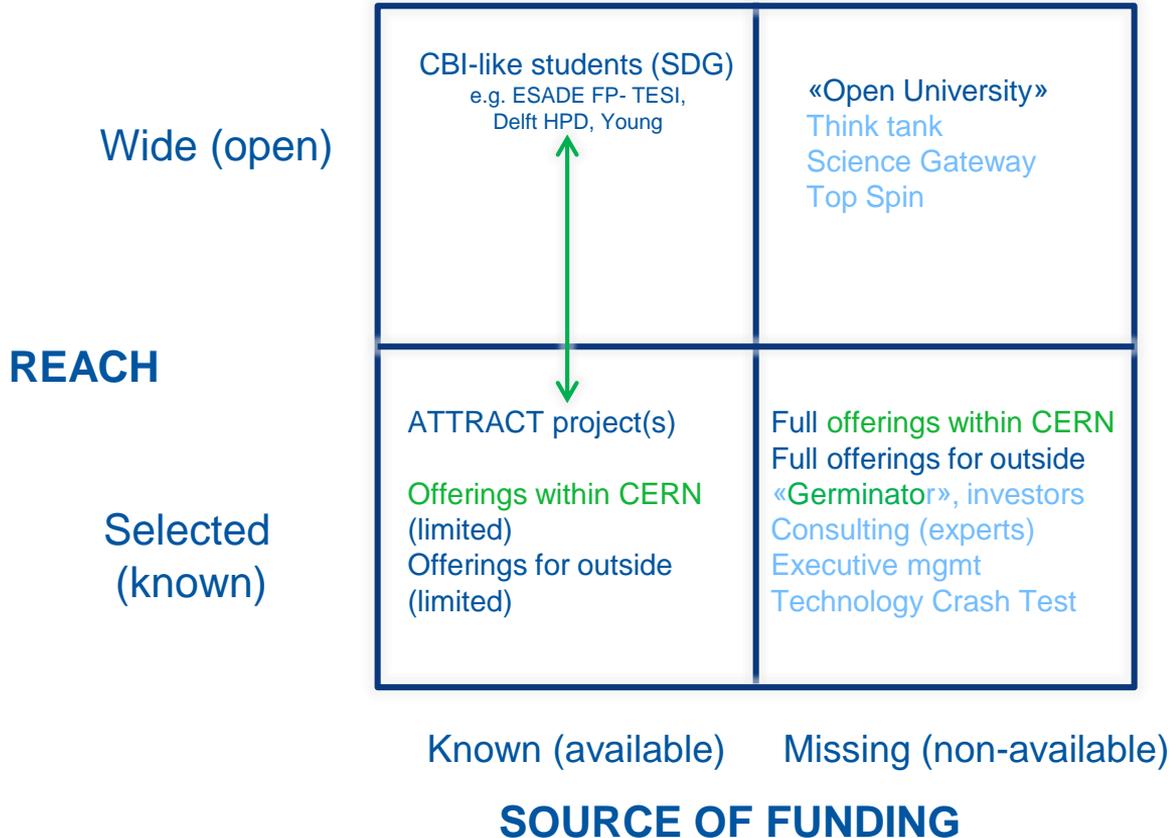


# HOW TO MAKE A SQUARE CLOSE A CIRCLE?

New activity (proposed on January 21st)	How could it serve ATTRACT? Examples ...
Think Tank (Oday)	Workshops around selected topics (expertise) from some ATTRACT projects (Phase 1 & 2)
Technology Crash Test Course (Santeri)	Testbed for ideas that spring out of ATTRACT
Learning Hub (Hans)	MOOC material (invited projects)
EU Funding Application Training (Pablo)	For selected Phase 1 projects not moving into Phase 2; preparing new initiatives
Investor Presence (Pablo)	Offer opportunities for Phase 1 (& 2) projects (note: not funded by Phase 2)
Top Spin (Pablo)	Piloting key concepts for «Maxi» ATTRACT, using Phase 2 as a test-case (note: not funded by Phase 2)
CBI Book (Claudia, Luciana)	Learnings from CBIs and Phase 1 student pilots; future trends, using some selected Phase 2 projects as some input
Link to Science Gateway (Luciana)	Presenting and working on selected projects prototypes Phase 2 on human machine interfaces
Space Awareness (Romain)	New course for students; test in CBIs in Phase 2

These would then need to be mapped on the ATTRACT time-line ...

# WHAT ACTIVITIES ARE FUNDED *TODAY*?



Recommended by ISAB-G  
Proposed on January 21st or later



# Idea/Project Resourcing vs. Possible Income

3,5	1,4,6	8	Hi
Net income	Cost neutral	Consume?	Med
2,7,9,10		11	Lo
Consume		Cost neutral?	

Possible income

Lo

Med

Hi

Required resourcing

1. Design The Future
2. Laserz
3. Exec mgmt. courses
4. CBI
5. Crowd4SDG
6. Science Gateway
7. CBI-teacher event
8. Corporate offerings
9. Innovation for Change
10. Innovations
11. Do-Tank

# Idea/Project Resourcing vs. Activity Domain or Category

		11
1,4	6	
7,9	2,5	3,8
		10

Hi

Med

Lo

Required resourcing

1. DTF
2. Laserz
3. Exec mgmt.
4. CBI
5. Crowd4SDG
6. Science Gateway
7. CBI-teacher event
8. Corporate offerings
9. IfC
10. Innovations
11. Do-Tank

ATTRACT

CERN-Must

Other



With additional info, could fit in ATTRACT?

Activity Domain/Category

# Laser Course for CERNies and visiting Students

<b>Deliverables</b>  Monthly course in the use of the Laser Cutter that was recently purchased at CERN.	<b>Who do you need from IdeaSquare for implementing your idea?</b>  Materials for the laser cutter.	<b>What your idea is about and how it fits at CERN?</b>  The course will enable users and personnel at CERN to build prototypes with the use of the laser cutter. This will speed up the prototyping enabling faster iterations and more testing.	<b>Whom will participate from CERN community?</b>  The target audience will be CERN-students, CERN-researchers, CERN-Engineers and visiting students.	<b>Implementation</b>  The course will be held the first time asap after the installation of the machine mid-September. most likely the first week of October.
	<b>What roles will they have and how much time will they need?</b>		<b>Do you plan to recruit help? How?</b>  Initially invite users that have been using 3D printers and workshops at IdeaSquare. Also the course will be listed on CERN Learninghub and promoted in social channels such as Young@CERN, and through email-lists.	

## Idea Timeline

First tests if the course will be done monthly in the fall of 2020. This is to make sure that the course outline is good. Then from 2021 it should be held on a monthly basis for CERN people, visiting ATTRACT researchers, and students.

## From Idea to Project

1. Install the machine in week 38 2020(1 week)
2. Prepare the course in week 39 2020(1 week)
3. Host the first course(s) in week 40 2020(1week)
4. Host monthly courses thereafter.

# 3D Printing Course for CERNies and visiting Students

<b>Deliverables</b>  Monthly course in the use of the 3D printers with a short introduction to CAD.	<b>Who do you need from IdeaSquare for implementing your idea?</b>  Materials and filament for the 3D printers.	<b>What your idea is about and how it fits at CERN?</b>  The course will enable users and personnel at CERN to build prototypes with the use of the 3D printers we have at IdeaSquare. This will enable the target group to use the 3D printers we have for prototyping parts.	<b>Whom will participate from CERN community?</b>  The target audience will be CERN-students, CERN-researchers, CERN-Engineers and visiting students.	<b>Implementation</b>  The course will be held the first time asap after the two new 3D Printers have been built. Most likely the printers will arrive in the middle of October. then the first course will be held 3 weeks after the arrival.
	<b>What roles will they have and how much time will they need?</b>		<b>Do you plan to recruit help? How?</b>	

**Idea Timeline**

First tests if the course will be done monthly in the fall of 2020. This is to make sure that the course outline is good. Then from 2021 it should be held on a monthly basis for CERN people, visiting ATTRACT researchers, and students.

- From Idea to Project**
1. Build the two new printers for the course when they arrive (1 week)
  2. Prepare the course material(1 week)
  3. Recruit interested participants (1 week)
  4. Host the first course(s) the week after recruiting(1week)
  5. Host monthly courses thereafter.

# FPGA and Labview Course for CERNies and visiting Students

<b>Deliverables</b> Monthly course in the use of Labview and FPGA with the National Instruments MyRio as the FPGA Platform.	<b>Who do you need from IdeaSquare for implementing your idea?</b> Infrastructure and the National Instrument Myrios	<b>What your idea is about and how it fits at CERN?</b> The course will enable users and personnel at CERN to code in Labview and use the Myrio FPGA platform to automate data capture and systems control.	<b>Whom will participate from CERN community?</b> The target audience will be CERN-students, CERN-researchers, CERN-Engineers and visiting students.	<b>Implementation</b> The course will be held the first time on September 29 <sup>th</sup> and October 5 <sup>th</sup> , and the second course on November 16 <sup>th</sup> and 17 <sup>th</sup> . That will allow us to evaluate the effectiveness of the workshop and how it can be improve based on feedback from the students.
	<b>What roles will they have and how much time will they need?</b>		<b>Do you plan to recruit help? How?</b> Adriaan Rijllart has agreed to help host the courses initially for 2020. it can be assumed that this can continue on 2021. Beyond this we should plan to have ourself do it, or someone that Adriaan recommends from CERN.	

**Idea Timeline**  
First tests if the course will be held on September 29<sup>th</sup> and October 5<sup>th</sup> and the second course on November 16<sup>th</sup> and 17<sup>th</sup>. For 2021 and beyond the aim is to have a quarterly or monthly cours.

- From Idea to Project**
1. Host the first to editions of the course(2months)
  2. Evaluate the effectiveness of the courses(1month)
  3. Launch the new courses for 2021(January 2021)

# Laser Course for CERNies and visiting Students

<b>Deliverables</b>  Monthly course in the use of the Laser Cutter that was recently purchased at CERN.	<b>Who do you need from IdeaSquare for implementing your idea?</b>  Materials for the laser cutter.	<b>What your idea is about and how it fits at CERN?</b>  The course will enable users and personnel at CERN to build prototypes with the use of the laser cutter. This will speed up the prototyping enabling faster iterations and more testing.	<b>Whom will participate from CERN community?</b>  The target audience will be CERN-students, CERN-researchers, CERN-Engineers and visiting students.	<b>Implementation</b>  The course will be held the first time asap after the installation of the machine mid-September. most likely the first week of October.
	<b>What roles will they have and how much time will they need?</b>		<b>Do you plan to recruit help? How?</b>  Initially invite users that have been using 3D printers and workshops at IdeaSquare. Also the course will be listed on CERN Learninghub and promoted in social channels such as Young@CERN, and through email-lists.	

## Idea Timeline

First tests if the course will be done monthly in the fall of 2020. This is to make sure that the course outline is good. Then from 2021 it should be held on a monthly basis for CERN people, visiting ATTRACT researchers, and students.

## From Idea to Project

1. Install the machine in week 38 2020(1 week)
2. Prepare the course in week 39 2020(1 week)
3. Host the first course(s) in week 40 2020(1week)
4. Host monthly courses thereafter.

# Idea for a CERN "Must-to-have" related Project

<h2>Deliverables</h2> <p>Target: General visitors to CERN, schools around Geneva and visiting schools and universities from around the world, CBI-network.</p> <p>Deliverables:</p> <ul style="list-style-type: none"><li>• An interactive model for researching on Human-Machine interaction</li><li>• Recorded web streaming that will also serve a wide audience.</li></ul> <p>Dissemination materials</p> <ul style="list-style-type: none"><li>• Presence in Science Gateway</li><li>• Data publication at CIJ</li><li>• Web streaming.</li></ul>	<h2>Who do you need from IdeaSquare for implementing your idea?</h2> <p>Fellow researcher 1 PJAS</p>	<h2>What your idea is about and how it fits at CERN?</h2> <p>Combining visitor experiences with different methodologies, IdeaSquare aims to generate new knowledge about human-machine interaction in an open and collaborative environment.</p> <p>The outcome will be engaging the public in a hands-on prototype experience. IdeaSquare will attract Science Gateway visitors to collaborate in an interactive and experimental innovation process, while sharing the importance of science.</p>	<h2>Whom will participate from CERN community?</h2> <p>Fellow researcher Scientist, researchers and technicians at CERN are invited to join the process</p> <h2>Do you plan to recruit help? How?</h2> <p>Inspired by the Explainers programs at several museums around the world, we plan to include a program for High-School students that after a training can be volunteers in explaining science to the visitors and helping in workshops and activities</p>	<h2>Implementation</h2> <p>It happens at ideaSquare and it's connected to Science Gateway.</p> <p>We will interact with:</p> <ul style="list-style-type: none"><li>• CBI-network</li><li>• CERN researchers</li></ul>
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<h2>Idea Timeline</h2> <p>Preparation phase: 2020 1st Phase (2021 - 2022) 20 weeks pilot: hands-on, "be-a-CERN-engineer-for-a-day" experience to young visitors coming to Science Gateway. 2nd Phase (2023 - 2025) session visitors are invited to IdeaSquare to engage also in more futuristic, multidisciplinary experimentation on the human-machine/technology interaction.</p>
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<h2>From Idea to Project</h2> <ol style="list-style-type: none"><li>1. Preparation of the program (3 month).</li><li>2. Preparation of the Explainers Program &amp; recruiting (3 months).</li><li>3. Implementation of first Pilot (3 month)</li><li>4. 1st Phase: 2 years</li><li>5. 2<sup>nd</sup> phase: 3 years</li></ol>
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## DRAFT Memorandum

**To** : XXXXX

**From** : Markus Nordberg/IPT-DI

**Subject:** Proposal for a pilot project for Science Gateway: “Be-a-CERN-engineer-for-a-day”

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Following the [Strategy Day](#) we organized on January 21<sup>st</sup>, and the recommendations we received from the IdeaSquare-GRADE Advisory Board ([ISAB-G](#)) from our annual meeting on January 31 – February 1<sup>st</sup>, please find below our proposal concerning how we could help to integrate current – and future – activities at IdeaSquare to Science Gateway next door.

### Offering

IdeaSquare would be ready to offer a hands-on, “be-a-CERN-engineer-for-a-day” type of experience to visitors coming to Science Gateway. The target group would be high school teachers and students, as well as early-stage university engineering students. This would benefit from one on-going CBI-student strand at IdeaSquare on designing next-generation Machine-Human Interfaces in the societal context, which is relying on active and innovative use of additive manufacturing tools (e.g. 3D printers). The focus would be on organizing structured, short conceptual prototyping sessions around CERN technologies such as accelerator components and detectors. Using IdeaSquare workshops equipped with lathe, laser cutter, 3D design and printing facilities, and the electronics lab, the teachers and high school students would be invited to discover, design, and print objects that relate to the physics and technologies used at CERN. The underlying theme would be “Science meets Engineering”. More specifically, this would include particle detectors, accelerator modules, vacuum pumps, cryogenic equipment, or even superconducting magnet wires.

## How would it work in practice?

Building upon the interactive exhibition at Science Gateway which offers a hands-on introduction to the basic physics and engineering principles behind accelerators and detectors, pre-announced sessions would be publicized and confirmed based on pre-registration. A group size would be max. 25 persons and a session will typically last for one hour<sup>1</sup>. Longer, and more dedicated sessions are planned to be offered in the second phase for returning visitors, provided sufficient interest is generated. The aim is to encourage the visitors to return to Science Gateway and IdeaSquare more than once.

## Educational goals

Although the short-term goal is to excite visitors through a unique hands-on experience in science and engineering, our intention is also to contribute to the following educational goals:

- Systematically foster informal learning in a non-educational setting, namely by investigating the impact of (3D<sup>2</sup>) design, printing, and visualization in improving the interest in science and engineering.
- Assess and optimize open source software for (3D) design and visualization.
- Develop an open access repository for (3D) printed models, kits and illustrative prototypes for science education and outreach.
- Modify (3D) printers to be more user-friendly and safe and make modifications openly available under the CERN Open Hardware License (OHL).
- Establish public engagement workshops, also on-line, on (3D) design and printing that is open and accessible to all members of the public, in particular for schools.

Moreover, from the sessions we will actively collect, analyze and publish data with our external partners from qualified educational institutions, including also

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<sup>1</sup> One hour is the minimum time to produce small, simple components using 3D printing so the intent is to use other production means in parallel.

<sup>2</sup> Other manufacturing methods will also be made available, e.g. laser cutting.

our current partners from our CBI-network<sup>3</sup>. Possible research topics will include, but are not necessarily limited to, for example:

- Impact of the offered outside-the-classroom sessions on gender, socio-economic background, and geographical distribution.
- Impact of the sessions on the use of related CERN Open Hardware platform, as well as other outreach-related material (e.g. CERN YouTube).
- Study of the discovery and the related learning processes, in the context of experimental innovation<sup>4</sup>.

### **1st Phase**

In the 1st phase (2021 – 2022), the IdeaSquare will offer visitors a selected sample of CERN technologies, accompanied by a short introduction. A baseline study prior to the first session, and subsequent studies following the first sessions, will be used to measure interest of the participants with regards to CERN physics and technologies. These measurements are used to assess and design the scaling up the interactive sessions, as well as to provide useful feedback to the exhibition team of Science Gateway working on the interactive exhibits.

The pilot will run for 20 weeks. Each week, selected visiting (high) school teacher groups will be chosen to take part in the workshop session. The study aims to sample about **XXX** teachers from **ZZ** different countries.

Visits to IdeaSquare would be reserved and prepared in advance by IR-ECO, sharing standardized material, also using (recorded) webcasting<sup>5</sup> including relevant preparatory information about CERN and Science Gateway.

In parallel, using the CBI-network, feedback and insights collected from the teacher pilots will be used to develop conceptual prototyping of machine – human interfacing and methodology to improve the learning experiences of visiting schools, with possible useful feedback also to the Science Gateway interactive exhibits on a longer term. Whenever feasible, the CBI-students in-residence will interact with the session participants.

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<sup>3</sup> These would include universities from, among others: Barcelona, Bologna, Ferrara, Torino, Melbourne, London, Geneva. From CERN, S’Cool Lab will be our co-organizer.

<sup>4</sup> This, in particular, falls into the scope of [IdeaSquare Journal of Experimental Innovation](#).

<sup>5</sup> Webstreaming will also serve a wide audience, as interest in using such equipment at IdeaSquare has been expressed e.g. by KT, CERN Alumni.

## 2<sup>nd</sup> Phase

In the 2<sup>nd</sup> phase (2023 - 2025), the results of the pilot for school teachers is extended for older age groups, as well, such as early-stage university students in engineering. Using the hands-on accelerator and detector exhibits now available at Science Gateway as inspiration, session visitors are invited to IdeaSquare to engage also in more futuristic, multidisciplinary experimentation on the human-machine/technology interaction. This will also include extending the current CBI-reach from engineering, design and management to e.g. arts<sup>6</sup> and humanities.

Combining visitor experiences with different methodologies, IdeaSquare aims to generate new knowledge from the sessions on human-machine interaction in an open and collaborative environment: the scientific methodology bringing systematic thinking and technological background, in dialogue with the humanistic subjectivity of art methods of creation.

The outcome will be engaging the public in a hands-on prototype experience designed for people of all ages, considering in particular how to bring science to young people, the natives of digital interaction. IdeaSquare attracts Science Gateway visitors to collaborate in an interactive and experimental innovation process, while sharing the importance of science. Through the interaction of the public with the experimental prototyping, we will be able to collect data to create new learnings on the field.

As in Phase 1, from the sessions we will actively collect, analyze and publish data. Possible research topics will include, but are not necessarily limited to, the following:

- Multidisciplinary research on the human-machine/technology interaction, involving the public, students, scientists and artists.
- Use of interactive experimentation to promote the importance of science for visitors in the context of the science Gateway.

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<sup>6</sup> For example, the Royal College of Arts in London has expressed its explicit interest in this type of collaboration. IdeaSquare has been collaborating with RCA since 2018 and has engaged so far over 400 students in common, futuristic projects.

## Resources

The overall budget plan for 2020 – 2025 is provided below in Table 1 (kCHF).

	Pilot					
	2020	2021	2022	2023	2024	2025
<b>Personnel</b>	<b>30</b>	<b>160</b>	<b>160</b>	<b>160</b>	<b>160</b>	<b>160</b>
<i>Fellow</i>	20	110	110	110	110	110
<i>PJAS</i>	10	50	50	50	50	50
<b>Consulting</b>	<b>15</b>	<b>30</b>	<b>30</b>	<b>15</b>	<b>15</b>	<b>15</b>
<b>Materials</b>	50	15	15	15	15	15
<i>Lab eqpm</i>		10	10	10	10	10
<i>Webcasting</i>	50	5	5	5	5	5
<b>Total</b>	<b>95</b>	<b>205</b>	<b>205</b>	<b>190</b>	<b>190</b>	<b>190</b>

Table 1. Budget plan for the Pilot (2020-2021) and estimates of annual running costs thereafter at IdeaSquare, as part of offered Science Gateway activities.

**The budget request for starting Phase 1 is 300 kCHF;** it being understood that a more detailed cost estimate is to be provided by the end of 2021 and, based on gained experience by then, a decision is made whether or not to proceed<sup>7</sup>.

Ideasquare would be ready to start Phase 1 during the summer of 2020, depending on access of visitors to the site.

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<sup>7</sup> For this reason, an initial length of 2 years is proposed for a Fellow position.

**> the future of human – machine interaction**  
**an interactive experience engaging visitors to CERN to research**  
**and understand how human & machine/technology relate**  
**3-year project: test pilot in Barcelona for Science Gateway in 2023**

**Generate  
multidisciplinary research  
on human-machine  
interaction**

**Create an interactive  
experiment that promotes  
the importance of science  
for visitors to cern**

**collaboration with Arts at  
CERN + alliance with the  
Barcelona City Council**

**> Combining the methodology of science and art to CO-CREATE**  
**a prototype engaging students, artists, scientists and selected CERN staff**

# Idea for a Project related to "Other"

<h3>Deliverables</h3> <p>Target audience:</p> <ul style="list-style-type: none"> <li>Organizations (for-profit or non-for-profit).</li> <li>We will organize dedicated events and courses, rental of space, facilitation of innovation related activities, access to CERN experts, and synergies with IS programs, e.g. CBI &amp; Attract.</li> <li>Offering brochure and, if possible, a dedicated website. Once activities will start to run, we can think about Social Media &amp; a newsletter.</li> </ul>	<h3>Whom do you need from IdeaSquare for implementing your idea?</h3> <p>Laëtitia Markus Pablo Laura Hans</p>	<h3>What your idea is about and how do you think it fits in IdeaSquare?</h3> <p>This is program makes the space and methodology of IdeaSquare and expertise of CERN available to organizations (for-profit or non-for-profit), who are looking for a neutral space to collaborate, innovative methodology to work, support on their product/service development that might benefit from access to scientific knowledge available at CERN and create synergies with organizations involved in deep tech innovation.</p> <p>The main goal of this project is to provide an alternative solution for IdeaSquare to be financially self-sustainable. All costs will be covered with the fees payed by the institutions, generating revenues.</p>	<h3>Who will participate in it?</h3> <ul style="list-style-type: none"> <li>Organizations (for-profit or non-for-profit).</li> <li>CBI-like students / Attract funded teams for special activities             <ul style="list-style-type: none"> <li>IdeaSquare staff</li> <li>CERN experts</li> </ul> </li> </ul>	<h3>Implementation</h3> <ul style="list-style-type: none"> <li>This project happens in IdeaSquare. Organizations come to IdeaSquare to develop activities.</li> <li>We can make synergies with student programmes, Attract and the GDFN.</li> <li>KT may be interested in joining activities with companies.</li> </ul>
	<h3>What roles will they have and how much time will they need?</h3> <p>Laëtitia: admin &amp; services coordination (30% before and for the events) Markus &amp; Pablo: talks (25-50% during the events) Laura: workshops support (50% during the events) Hans: labs (25% during the events)</p>		<h3>Do you plan to recruit help? How?</h3> <p>Create a brochure and a presentation, and organize meetings with potential companies to sell the project. Also IdeaSquare can include it in the website. KT may be interested too in offering to companies.</p>	

### Idea Timeline

Start the preparation of the idea: September 2020.

Launching: January 2021

It's a client demand model. Events will be delivered on demand, depending on IdeaSquare availability.

### From Idea to Project

- Definition of IdeaSquare offer (1 month).
- Preparation of communication materials (a month).
- Sales actions: from January on
- Confirmation of the events: 3 months in advance
- Design of the activities and coordination prior to the activities will happen: 3 month before starting
- Activities schedule: on demand, from 1 day to 3 days. Longer programmes could be prepared, based on regular activities at IS, e.g. 3 month meeting

# Idea for a Student Project

## ATTRACT and deliverables

Please indicate:

- Student groups can deliver prototypes and testimonial videos explaining the project, and reports too.
- For helping the ATTRACT outreach we can create videos, write CIJ articles, and create cases/presentations for dissemination in other schools and spread the projects experiences.

## Who do you need from IdeaSquare for implementing your idea?

Pablo  
Laura  
Hans  
Laëtitia

## What roles they will have and how much time they will need?

Pablo (gives a talk) (5%)  
Laura (coordinates with the CBI-networks) (20%)  
Hans (support for labs and prototyping) (30%)  
Laëtitia (administration) (20%)

## What your idea is about and how it fits in ATTRACT?

This is a CBI-like / DTF programme, addressed to younger students from 15 to 18 years, in their last years of high-school.

The objective is to promote STEM and the impact of a course like CBI or DTF have on undergraduate and graduate students, and implement it in a previous educational stage. Its linked to Attract as we can get knowledge for understanding and systematize the way multidisciplinary groups find innovative responses to challenges from early education stages, and research into how to better connect physics and society from school.

## Who will participate from outside IdeaSquare?

High-school schools  
CBI-network  
CERN experts

## How do you plan to recruit them?

High-school students could be recruited in Barcelona. From personal and professional contacts I can reach several schools with high-level and interesting projects

## Implementation

The project could be implemented in two formats:

- Mixed: partly at IdeaSquare, partly in the city where the school is located.
- All happens in the city where the school is located.
- We can involve ESADE, and CBI-network
- The challenges of the programme could be linked to ATTRACT funded projects area of expertise.

## Idea Timeline

The idea could be delivered in different pilots. I suggest year 2 2022 / Month 4-7 or 5-8 (e.g. January/February to April/May). We can do an iteration per year, on years 3 and 4

I think month 4 year 1 (January 2021) would be a good moment, considering that schools need time in advance to make their academic planning.

## From Idea to Project

1. Design of the proposal (1 month)
2. Contact and recruitment of the schools (during 3 month).
3. Planning and coordination of the activities (2 month)
4. Project execution (4 months)

# Workshop and coaching on creative process for innovation

## ATTRACT and deliverables

- Feedback collected from the students and organizers, report and videos from the workshops
- videos, factsheets, CIJ article as dissemination materials
- Turnkey “product” module available for organisations outside of ATTRACT’s and IdeaSquare’s perimeters (e.g. EC, UN) acknowledging the initial support of ID2 and ATTRACT in developing the module

## Who do you need from IdeaSquare for implementing your idea?

Tuuli  
Romain  
Markus/Pablo

## What roles they will have and how much time they will need?

Development and delivery of modules (Tuuli & Romain ~ 4 weeks/year)  
Markus/Pablo to get in contact with the students’ courses organisers and review deliverables (2 days/year)  
Integration for the program coordinator (few hours)

## What your idea is about and how it fits in ATTRACT?

The idea is to develop a module that can run between 2h and 2 days with associated coaching on how to sparkle the creative processes for the students to connect to a more human dimension of themselves and then better address the societal challenges ahead of us. The approach is to start very simple with concepts like time, space, movement and explore the perceptive fields around those to guide the students into accepting the unknown and being confident to develop disruptive solutions from this realm. This module can be a plug in to a overarching students’ programme.

## Who will participate from outside IdeaSquare?

Partners from our University collaborations and student programs will co-develop and/or give feedback for the content.  
Invited guests on key topics

## How do you plan to recruit them?

Several people expressed interest in Quo Vadis so we have our core collaborators together

## Implementation

The module can take place at the locations of the student’s programme or online

There is a will to involve those having expressed an interest in the CBI/DFGN community during the Quo Vadis workshop

The ATTRACT funded projects will be indirectly involved through the creative processes that will be applied following this module by the participants having attended it.

## Idea Timeline

We start developing & testing the modules in 2021 with our collaborators

We start delivering the modules in 2022 in the beginning phase of the student projects

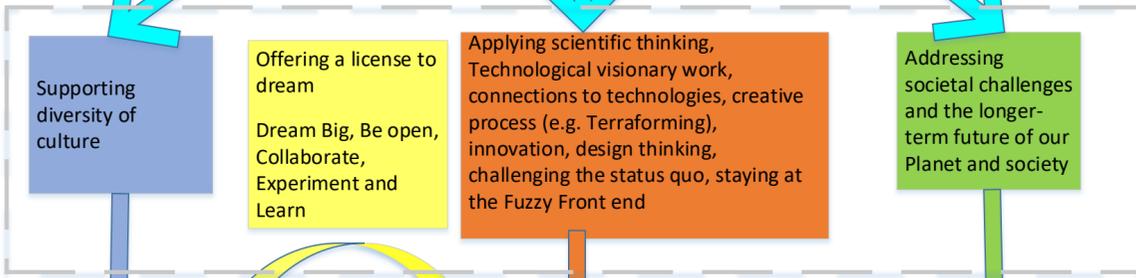
## From Idea to Project

Developing prototype modules (2 weeks)  
Delivering prototype modules (2 days per module) to be repeated

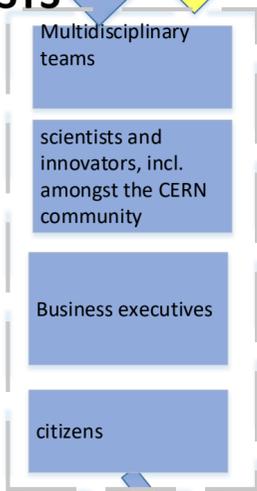
Fine-tuning the development of the modules (1 week)  
Delivering the modules (2 days per module) to be repeated  
Analysing the collected data and writing the CIJ article(s) (4 weeks)

**VISION:** become the global reference for how science and society collaborate in multidisciplinary teams to create innovative solutions for the future of humankind.

**ENABLERS**



**TARGETED GUESTS**



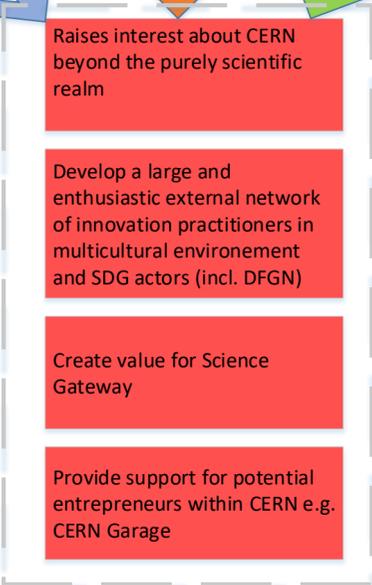
**MAGIC FORMULA**



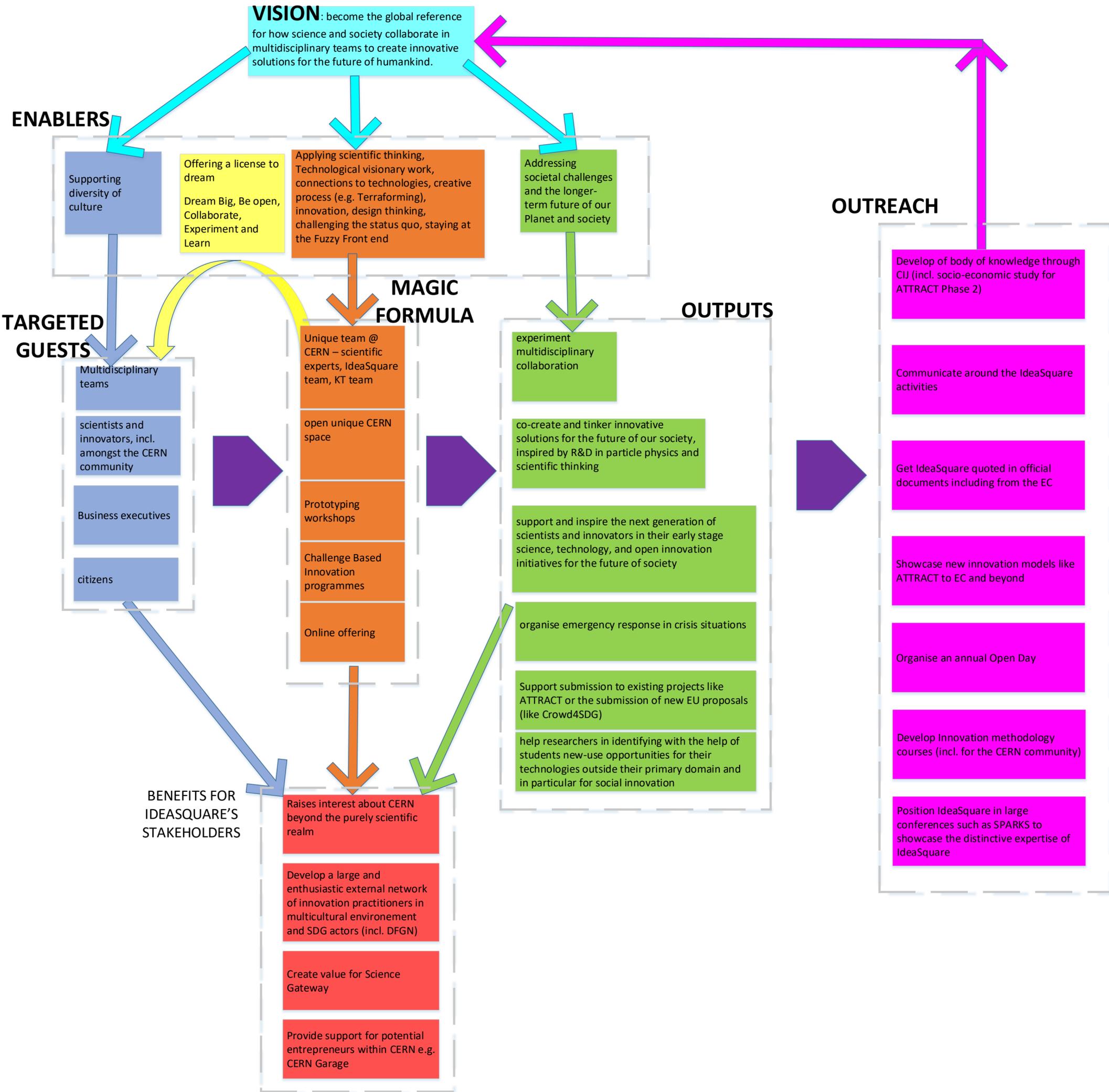
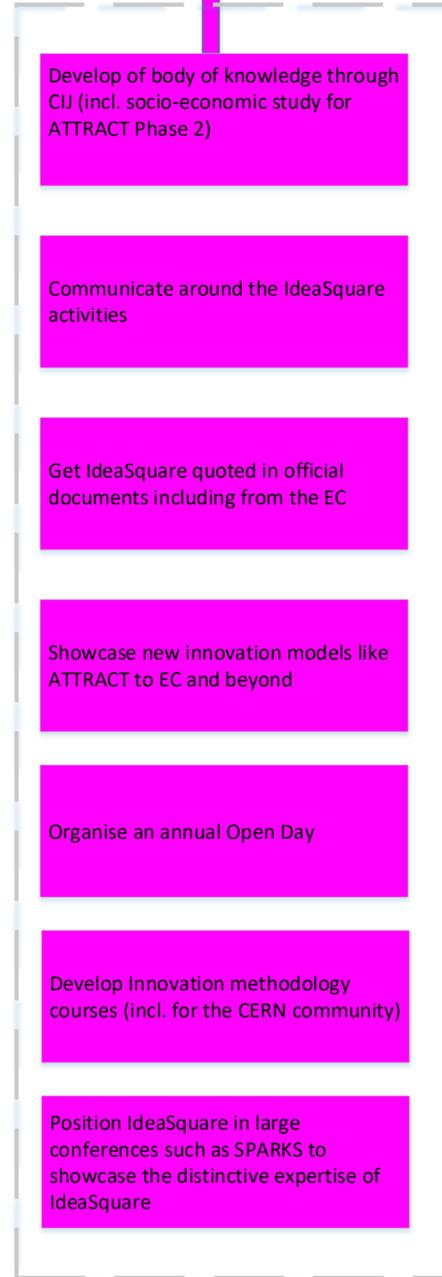
**OUTPUTS**



**BENEFITS FOR IDEASQUARE'S STAKEHOLDERS**



**OUTREACH**



# Briefing notes from IdeaSquare student programmes teachers meeting

## QuoVadis?

**IdeaSquare student programmes**

**Online Teachers meeting 2020**

November 30th - December 1st



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*Idea*<sup>s</sup>

## Introduction

*QuoVadis? Teachers meeting* has been not only a fruitful meeting among the most active contributors to IdeaSquare student programmes since the first CBI Course in 2014, but also an opportunity to meet each other and strengthen our bonds as a community.

The objective of these briefing notes is to capture the most important take-aways from the two-day teachers meeting. The first day of the meeting focused mostly on the past: what can we learn? The second day was devoted to imagining the future and the next concrete steps we might take. This summary follows the flow of those two days.

## IdeaSquare vision

Become the global reference for how science and society collaborate in multidisciplinary teams to create innovative solutions for the future of humankind.

Student teams are multidisciplinary, or at the very least look at one discipline from another discipline's point of view.

There is collaboration between students (the society) and CERN and / or ATTRACT (science). IdeaSquare encourages and supports to find ways to tie student activities to ATTRACT.

Student teams work for innovative solutions for the future of humankind: even when the challenge is given by a company, it is fitted into a larger context. IdeaSquare provides a framework for how different solutions can be fitted under a larger umbrella.

We hope to learn and share our learnings: to become a global reference. This requires both research (CIJ) and outreach (templates for data gathering and active "cross-posting" etc.) activities.

# Attract

[ATTRACT](#) is an initiative with the purpose of funding breakthrough R&D&I technology projects on detection and imaging technologies, for boosting fundamental research, industrial applications and social innovation. The vision behind ATTRACT is deploying a pan-European breakthrough innovation ecosystem in the field. IdeaSquare coordinates ATTRACT, and next year ATTRACT will go into Phase 2. It includes student projects that in collaboration with the funded research projects seek solutions for Social Innovation. The objective is providing opportunities for up to 400 young innovators. The student projects are expected to happen during 2022-2023 and will be running at Aalto, ESADE and IdeaSquare premises. All the organizations interested in getting involved will be contacted in due time during 2021 – and it is more than welcome to tie student programmes at IdeaSquare to ATTRACT.

## HOW?

**ATTRACT as one of the learning modules, a translator or bridge between students and tech?**

**The ATTRACT project/s as an open-ended challenge, where the suitable technology for the solution is incorporated a posteriori, and with a commitment from the scientists to work with the students? Or opposite of this, where students start from ATTRACT tech?**

**Bring IdeaSquare student programme thinking, processes, and tools to ATTRACT projects and network, connecting people.**

**IdeaSquare Retreat: innovators like students, alumni, and scientists, gather to work on ATTRACT projects rapidly.**

# Presenting IdeaSquare student programmes - what have we learned

- [12 programmes](#) in which students come to IdeaSquare, including two KT run programmes.
- Programme duration from 1 week to 8 months.
- Students work mostly in multidisciplinary teams (except with CREA, when marketing students work on physics), mostly Master's, but some mix PhD, Master's, and Bachelor's levels.
- Some programmes need to find funding, some are funded by their home institutions.
- Topics range from solving SDGs, to using ATTRACT tech for social innovation, to solving sponsor problems with a potential CERN tech connection.

Even if the **Programme formats** are very different, it's clear that doing intense working periods at CERN IdeaSquare is key. During these, students get inspiration from the CERN environment. They have a sense of surprise and adventure, and strengthen the relations within and across teams. It seems that having the stay at the beginning of the course might be the most beneficial.

The period at CERN also facilitates the connection and the **interaction with the CERN community**. Interacting in informal environments seems to be more attractive to the CERN scientists. Students need to understand the interest of scientists and their language to engage them in their projects.

Useful and effective **methodologies and tools** include canvases and frameworks to support technology exploration, tools to promote and experiment with creativity, future thinking and foresight workshops, hands-on exercises and prototyping, and interactions with experts. Tools for communication (storytelling, video editing) are becoming ever more relevant.

**Topics and learning outcomes** are challenging, even not feasible to align among a multidisciplinary team. The assessment of learning should reflect also the learning journey, as some teams can have tremendous learnings even if their end result is poor. A high level of freedom enables better learning and self-confidence.

**Challenge definition** is the starting point for success and should be adapted to the workload of the course. There is a positive experience when the students have the freedom to reframe the challenges, having little boundaries, but a clear goal to aim for. There is still an open question about the link to technology challenges.

**Fundraising and challenge sponsors** add another angle to this discussion. Having sponsors for the challenges gives real-world cases for students to work on, and funding for travel and prototyping costs, but on the other hand, students are restricted by sponsor expectations. There are many proposed paths to look for new models in this area.

Multidisciplinary **team formation** is a must to have for the student projects, although sometimes it is not easy to find enough students from all the disciplines. Students come from different fields and different ways of thinking, and colliding these helps students to think in a

more open way, both gaining understanding of and respect for other disciplines and the ability to use their own discipline in a new context.

**Cross-contamination among CBI students** from different courses is desirable, as it would help students to share knowledge, experiences on challenges that could be related, and learn from previous experiences and projects.

A strong **Alumni Network** could support **project outcomes and their implementation**, for example finding partners and funding for taking projects further once the project has finished. Many of the students may be interested in continuing the projects if they have the support for doing so. The creation of an Alumni Network could also facilitate tracking the path of the students after the IdeaSquare course and research about the impact of the course in the students' career.

The discussion about **pedagogical research on innovation education** shreds of evidence that IdeaSquare inspires and motivates research, supporting a think big mindset. There are many fields open for research, including the future workforce skills, SDG education effectiveness and benefits, and the science-inspired innovation frameworks and tools.

### When going online...

- it has been frustrating for students not traveling to CERN. Exploring new ways to improve team dynamics and developing new ways for co-creation is needed.
- it has become possible to split the interaction with CERN throughout the course, giving more options.
- it is easier to connect with people that are far away, but online interaction gives no room for serendipity.
- connecting with CERN experts is both easier (can join from home for lunch with strangers) and harder (yet another Zoom call, no bribery with Italian treats possible).
- online tools allow for potentially better intra-team communication but make peer to peer learning and communication across teams more time consuming and proof-of-concept prototyping and user testing more difficult.
- in general, more time is needed for everything, and the scope of the course should reflect that. More time is also needed for the coordination of the course.
- there are new opportunities: a wider group of students can get the possibility to take part in IdeaSquare student programmes, alumni who might not be physically in the same space are easier to reach, and new learning outcomes (online collaboration, storytelling with video) can be naturally implemented.

# Research-CIJ Special Issue and Beyond

A call for abstracts for a [CIJ](#) special issue was launched:

- 1st authors jointly as Special Issue editorial board
- Extended abstract and presentation to ISAB late Jan 2021
- Manuscripts (<3500 words) early March 2021
- Review process March-April 2021
- Special Issue published late May 2021

[Matteo Vignoli](#) and Saku Mäkinen are leading the process. Several topics were suggested, below in order of amount of interest, but not all of them seem to be feasible to get to this special edition - maybe something to consider on a longer term.

1. New methodologies and tools, for example, increasing cross-contamination among courses, how to motivate serendipity.
2. What impact do the courses have on companies and society?
3. Learning outcomes: what are they / should they be?
4. Learnings from moving online: facilitating online, virtual prototyping
5. What happens after CBI: to the projects and the students (impact of CBI, life-wide learning)
6. Changes in society: transformation of society / moving online / post covid/structure of the universities in the future.
7. Short case studies of the courses: comparing curriculums. Could include what works best for programs with different duration? This should be the baseline for the upcoming CIJ Special Issue.
8. Learning outcomes: how to measure?

## Key challenges to be worked upon

The programme format, the methodologies and tools, the topics and learning outcomes, and the interaction with CERN community, need to be aligned. The challenge definition has to enable enough of freedom for the students to get away from incremental to exponential. This needs to be further supported by the tools and methods, as well as communicated through the learning outcomes and required deliverables. For example, asking students questions about feasibility and to create a functioning prototype might stop them from going over and beyond the incremental. Asking to follow the Design Thinking methodology, but starting from a technology, might be confusing. How might we support the vision of IdeaSquare while supporting students to push their own limits, and ensuring the necessary sources of funding?

# The future of IdeaSquare Students Programmes

There are many insights that we take to build a vision of the best and most amazing Challenge Based Innovation course at IdeaSquare in 2025.

The main elements that should constitute the backbone of the course are:

**Connection to CERN:** The connection with science, experts, and scientists is relevant, and offers a difference from many other Challenge Based Innovation courses worldwide. Visiting CERN, and spending time at IdeaSquare is a must to have.

**IdeaSquare as a knowledge Hub:** IdeaSquare is the connection space between CERN and partner institutions, between the CERN community and students, between different courses that converge in the same space.

**Centralized + decentralized:** IdeaSquare remains a global hub that centralizes the local activities that happen in the home institutions.

**Experimental methodologies:** Push new methodologies that could help students to develop crazy ideas that could lead to projects with exponential impact. Go beyond the limitations of actual methods to reach visionary fields of imagination.

**Multidisciplinary & multi-age:** The multidisciplinary environment could be expanded to a wider scope of disciplines that could contribute to enrich the innovation processes (e.g. Social Sciences, Arts). Also fostering life-long learning is a key element, mixing visions from people with different levels of experience.

**Support to the process:** offering off-line and online support materials guide the innovation process, democratizing the course as this may allow more people to join.

**Sustainability & Social Impact embedded:** These two aspects should be transversal and embedded in any project.

**Guidance after the course:** offering a platform to help projects move forward after the course.

## Where we want to go

In the future world, the different courses are interlinked. Even more than that, the solutions students work on are not forgotten: they are worked upon so, that student team after student team feed into a mutual goal, which in the end takes us to implementation. The link between the students and scientists is much stronger than now, and they work together as peers with complementing viewpoints. The online is used for support, providing the ability to reach the right people at the right time, and to include those interested – but the physical interaction between people remains key to forming strong links for multidisciplinary collaboration, lasting friendships and memorable experiences.

## Ideas Pitching by participants

**Kyriaki Papageorgiou: The Tree of Knowledge** - if you expressed interest, Kyriaki will be in touch with you.

**Pablo Tello: Quantum Concept-Dynamics** - let Pablo know if you are interested!

**Andreea Cotoranu: Real-Time water monitoring** - send a message to Andreea to find out more.

**Romain Müller & Tuuli Utriainen: Body of knowledge** - if you expressed curiosity, Tuuli and Romain will be in touch with you.

**Sem Carree: Future of facilitation** - for questions, reach out to Sem.

**Oday Darwich: Platform to share research** - Oday will get back to you.

**Luciana Leveratto: Including Teen-ager in Challenge Innovation processes** - maybe something to consider in the future.

## Next Steps

Harri Toivonen and Laura Wirtavuori will be working on the *QuoVadis? Teachers Meeting* learnings, to create a plan for what happens next. We hope to make some ideas real already in the first quarter of 2021, and for the other ideas deemed feasible, aligned with the strategy, and with a good input to output ratio, we hope to come up with an implementation timeline and plan. Please keep in mind that we are a community! IdeaSquare is happy to propose a direction and to strive to take the courses we collaborate on to really the next level, or maybe ten levels from here, but there is nothing IdeaSquare can do without the participation of students, and that means also the time and effort of our collaborators in the IdeaSquare student programmes. We hope you take the time to go through the Miro canvases, and see what it is you could, realistically, implement within the next couple years.