

KiiCS Art & Science for Innovation

A Guide to Incubating Innovation in Art and Science





The KiiCS project is supported by the European Commission within the Seventh Framework Programme

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Project Background

KiiCS (Knowledge Incubation in Innovation and Creation for Science), was a 3-year project, funded by the European Commission to stimulate new forms of socio-economic innovation and creativity.

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It brought together scientists, technologists, artists, designers, and entrepreneurs throughout Europe, to work across sector boundaries, foster interactions between art and science and incubate ideas.

Over the lifetime of the project, KiiCS partners established incubation modules around diverse frontier science themes including smart cities, sustainable fashion, urban mobility, music, neuroscience and biotechnology. The innovative outcomes of these activities, including ideas, projects, and processes, were put forward to be selected for a European KiiCS Award.

KiiCS partners aim to incubate ideas in art, science and technology through multi-disciplinary actions. Specifically, KiiCS aims to encourage people, and young adults in particular, to engage in scientific activities and raise their interest in science and technology. More broadly, KiiCS partners aim to connect innovative ideas and processes generated through these activities with the entrepreneurial and business world.



Aims and Scope

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This toolkit is the final deliverable for Work Package 1 of the KiiCS project. The purpose of Work Package 1 is to explore and assess incubation modules through two objectives. The first objective is to identify and design methodologies and processes to incubate creativity and innovation through interactions between the science and creative fields. The second is to integrate the results of the project in an Incubation Kit.

The toolkit is a free tool that can be used to promote and develop incubation processes between science, art and creative fields, to offer advice gained from experiences throughout the KiiCS project, and to provide recommendations so that any user of the kit will be able to establish their own incubation activities. This toolkit will be available in 8 different languages.

Tips for Success...

The toolkit contains a selection of key learnings from the activities that were carried out throughout the KiiCS project.

Watch out for...

Throughout the toolkit there will be warnings of potential pitfalls or obstacles stemming from the experiences of the KiiCS consortium partners.



Defining Terminology

The terminology used in this project, for a few key terms in particular, may have several meanings and interpretations depending on context and applications. In order to minimise ambiguity, key terms used in this project are defined here.

Art and the Creative Sector

The terms art (or artist) and creative sector are applied here in a broad sense. These terms are used to encompass people working in creativity and culture including core arts (visual arts and heritage), the cultural industries (cinema, radio and TV, publishing, music and gaming) and the creative industries (design, fashion, architecture and advertising).

Incubation

Incubation is a widely used term that has many applications depending on several variables, including the actors involved and the focus of the work. Reflecting this fact, a large number of detailed definitions have been put forward in published literature focusing on Incubators.¹

It refers to a process or series of actions and experimental approaches aimed at stimulating the production of new ideas (e.g. a product, a service, a process) or at enhancing people's skills (e.g. artists in residence, educational courses, workshops) specifically emerging from the interaction between the creative sectors and science.

Young Adult

Much like the term Incubation, the term Young Adult can be variably defined according to a diverse mix of factors. Young Adult in the context of the KiiCS project refers to people between the ages of 14 to 17 years.

¹ Hackett, S. M., & Ditts, D.M (2004). A systematic review of business incubation research. The Journal of Technology Transfer, 29(1), 55–82.

A Guide to Incubating Innovation in Art and Science

This guide describes the steps needed to successfully establish your own incubation activities.

Step 1: Choose the desired outcomes

Innovation is not something that can be guaranteed to occur through any process or activity. It is, by its very nature, difficult to plan for and capture. However, giving thought to the desired outcomes in advance of all activities will significantly increase the likelihood of innovation occurring in way that can be incubated and nurtured. When planning an activity, it is a worthwhile exercise to list examples of all realistic, tangible goals that could come from a successful activity and then allow these goals to guide future decision-making for the activity.

Tips for Success...

Deciding if the aim of the activity is to produce economic, educational, social or cultural innovation will help provide guidance on which experts are needed for consultation or mentorship during the activities.

Step 2:

Decide a theme and topic

The theme and topics of your incubation activities will provide an opportunity to seed ideas for the scientific and artistic elements of a project and how they might come together in an innovative exhibit, product or design.

Tips for Success...

When considering themes and topics, it is valuable to take into account the perspectives of artists, scientists, designers and other actors to allow ample room for creativity. Examples of topics that worked well in the KiiCS project included: Cities of the Future, Life Science, and Makers & Hackers.

The suggested themes were chosen because they reflected local challenges, problems or concerns and this contributed significantly to the motivation of participants in incubation activities. Community-based themes help bring people together and empower them. The above themes also worked well for the KiiCS project because they facilitated collaboration across countries. The opportunity to be inspired by the work being done in other countries should never be overlooked and can help lead to internationally applicable incubation activities.

Watch out for...

Picking a topic without giving it enough thought will cause problems later in the process. Choosing a theme or topic that is too specific might be seen as a constraint, but having a vague topic can make it hard to focus on a single direction for the activity.

Step 3: Assemble a Team

Once the theme and topic have been chosen, the next step is to make sure there is a team in place that recruit external "experts", e.g. scientists, designers, artists, businesses, entrepreneurs, and policy makers to deliver the activities or run different elements of the terms of inspiring the activity participants to innovative thinking. The specific contribution of these mentors is to demonstrate the cutting-edge of their respective fields so that the participants can work on frontier crossmembers of the team, and just as important as the role this end, the team members will need to have excellent of modules of the activity, it can be useful to also involve them in a consultation or evaluation capacity later in the programme. As an additional challenge during the activity the participants can be tasked with finding and recruiting their own mentors.

Tips for Success...

A typical KiiCS team assembled to run a Bio-Hacking themed activity could consist of the following members: **Coordinator:** To lead team, organise the mentors, location, equipment and evaluate activity **Expert Mentors:** To lead activity **Communication Officer:** To help connect with the target audience and disseminate learnings. **Designer:** For web and content design **Activity Co-Facilitator:** A team member who is familiar with the space, the target audience and workshop facilitation who can help assist the mentors in running the activity

Step 4: Establish A Location

The location that is provided for incubation activities will have a bearing on how the activity itself functions and should be treated as a vital component. A minimum requirement is that the working environment must be a dynamic place where different skills can be applied to collaboratively work and share opinions and tools. Ideally it would be based in an urban area, easily accessible to the general public and often with direct links to other organisations e.g. institutes of education, startup incubators and businesses. Having the incubation activity close to these organisations will make it easier to involve them later in the incubation process.

Tips for Success...

An ideal location is one that fulfills all the activity needs and provides a supportive platform for successful incubation. An example of such a location that worked for KiiCS activities is a brightly-lit, wellventilated, studio space that can easily be configured for a range of activities and can be augmented with power supplies, tables, chairs, flip charts, projectors and other equipment.

Step 5:

Identify and connect with the target audience

Identifying the principal groups that would benefit from being involved in the incubation activities and finding the best way to communicate with them is a unique challenge for every team. The KiiCS project specifically targeted Young Adults, which in the context of the project, referred to people between 14 & 17 years of age. Research on the preferred methods of communication between the target age group in the local area and the preferred social media platforms is a necessity. The networks, mailing lists and reputation of the organising body may not always be enough to entice the desired target audience to take part in the organised events. The KiiCS project utilised a competition structure, culminating in award ceremonies, to incentivise involvement for the target audience.

Watch out for...

If all of the target audience comes from the same group the incubation activities might lack the diversity that comes with varied backgrounds and perspectives.

Tips for Success...

While the public was always the predominant target audience of the KiiCS incubation activities, occasionally certain activities could warrant encouraging more experts to take part in the activity itself rather than just acting as the expert mentors. For some of the "Future Cities" KiiCS activities it was found to be beneficial to have architects among the participants as well as those helping to lead the activities.

Step 6:

Communication and Marketing Strategy

The next step is to establish a communication plan to engage with the target audience and a marketing strategy to connect with the broader public. The first phase of this process should be to decide a clear message that needs to be communicated. The design and content of the communication plan should follow and finally the community, network, social media, and press should be contacted to publicise the incubation activity.

Tips for Success...

To recruit the most engaged participants most KiiCS partners used both a targeted approach as well as an open call process.

KiiCS = Art + Science + x(1)

<u>+ x(2) + =</u> incubation

processes for innovation

(where the 'x' variables are additional components such as technology, design, etc. that can be included depending on the activity in question)

Step 7: Carry out the incubation activities

The key step is carrying out the incubation activity. Combining artists, scientists, designers and other participants in mixed groups with shared challenges to work on within the topic is the most productive format. Recording learnings and ideas will strengthen the activity. For young adults (14-17 year olds) it is even more important to include participants from varied and diverse backgrounds, as co-learning is pivotal at this age. Broadened perspectives will enhance the incubation process. Forming teams composed of participants with mixed backgrounds in order to work towards innovation will add an element of healthy competition.

Watch out for...

A potential pitfall can arise if your relationship with the expert artist or designer breaks down during the activity. Having a written contract in advance is good practice. Some KiiCS incubation activities ran over weeks or months while others were 1-day intensive workshops. The format often followed the following plan:

Activity kick-off with a short talk or debate lead by experts on the specific theme or challenge in question
All participants brainstorm ideas within the topic that could potentially address the problem or concern
Mentors start providing advice and feedback

•Groups are formed among the participants to start prototyping

•Each group works on developing their prototype into a viable product for business

•Participants pitch their ideas to each other and to a panel of art, science and business experts in order to determine which are the most innovative

See p22 for sample incubation activities taken from the KiiCS project.

Step 8: Evaluate and Disseminate

The penultimate step is to evaluate the activity with respect to its objectives to ensure that positive results are captured and mistakes are learned from. The legacy of the activity will depend on the result of the activity. An incubation activity has achieved its primary goal of successful incubation activity if it leads to the creation of a product, exhibit or process that is considered innovative in the eyes of the expert mentors. While this is the ideal outcome, a positive experience of an incubation activity for the participants should also be strived for and secondary outcomes could include new skills, social cohesion, and renewed interest in the fields of science, technology, art and design. Whether there are successfully incubated ideas or not will be the biggest factor in the evaluation and dissemination and consequently both scenarios should be planned for. Implementing a strict policy of documentation throughout the activity will make it easier to show that learnings are taken into account. Disseminating the results will allow future activities to build on the incubation.

Tips for success...

To ensure that the activity reaches the furthest possible audience it is recommended to use an open licence like Creative Commons. There is no registration to use Creative Commons licences and it is one of the best ways to share knowledge and creativity with the world. True creativity comes from changing perspectives and challenging preconceptions.

Step 9:

Ensure Legacy

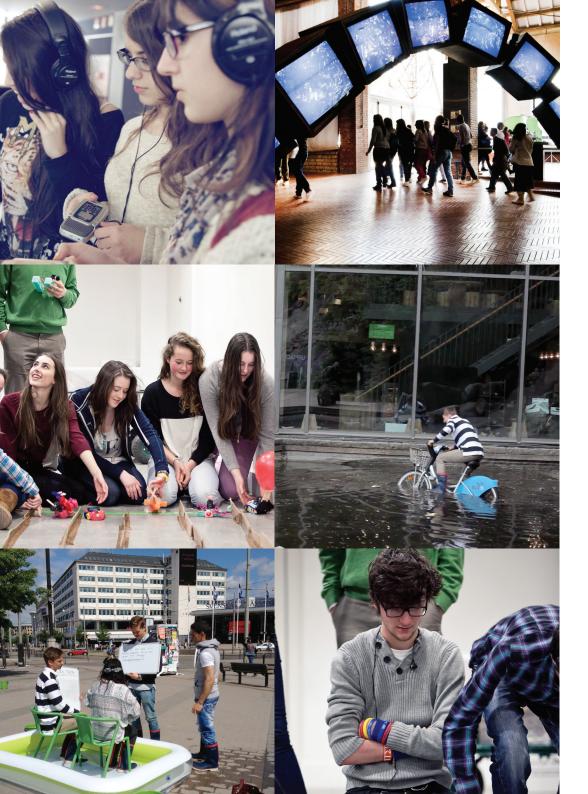
The final step is to try to ensure that the activity will continue to inspire innovation beyond the lifetime of the project. If the resulting innovations can be investigated in terms of potential business opportunities it will fulfill the goal of the activity – bringing an idea from conception to entrepreneurial fruition. Connecting the activity participants with relevant companies or local authorities that would have an interest in the continued development of their ideas could give the activity the necessary impetus to proceed.

Tip for success...

Incentivising the procedure can propel the activity in exciting directions. The KiiCS project incorporated a competition and two subsequent awards (a European KiiCS Award and a European Youth KiiCS Award) to reward the most innovative ideas. This served to motivate and encourage the participants during the incubation process.

Watch out for...

Putting unrealistic expectations on incubation activity participants (in particular young adults) can sometimes hinder creativity. While connecting innovative ideas with businesses is the ultimate aim, at least initially the participants should be given freedom to express their creativity without worrying unduly if their ideas would be worth investing in.



Sample Activities

This annex contains a number of examples of successful KiiCS incubation activities that have been undertaken during the KiiCS project.

More information on this project can be found at: www.kiics.eu

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Beam Time Artist Residency London, England.

When and where the activity took place:

The Beam Time Artist Residency ran from February-May 2014 at The Arts Catalyst in London, England.

Who the incubation activity was for:

Together with Artguest and the Central Laser Facility, The Arts Catalyst selected artist Alistair McClymont from a field of over 60 high quality applications for the Beam Time Artist Residency. The Arts Catalyst is an arts commissioning organization based in London that works throughout the UK and also internationally to bring arts and science together. Through exhibitions, workshops and events, The Arts Catalyst enables people to have distinctive, thought-provoking experiences that transcend traditional boundaries of art and science. Alistair McClymont often creates artworks through collaboration with scientists, for example he worked with a meteorologist at Manchester University to develop his piece Raindrop, with a nuclear physicist at Kings College Hospital using their MRI scanners, and worked at NASA's Goddard Space Flight Center in Washington using their ocean weather data and sunlight data.

What the incubation activity looked like:

The Beam Time Artist Residency was a 3-month incubation that gave artist Alistair McClymont a unique opportunity to develop his practice through a period of intense research and engagement with leading scientists and the frontier science that they conduct at the Central Laser Facility.

The reasons for doing this activity:

The Beam Time Artist Residency allowed Alistair McClymont to develop his practice (and potentially a new body of work) through research and engagement with leading scientists and the frontier science that they conduct at the Central Laser Facility. It sought to benefit Alistair McClymont through experimental and critical engagement of his art with science as well as the general arts community through collaboration and discussion. It also foregrounded the work of the Central Laser Facility to new audiences and promoted wider engagement with their work and ideas.

How non-participants could engage with the project:

Through residency, The Arts Catalyst is able to produce provocative, playful, risk-taking projects to spark dynamic conversations about our changing world. Non-participants were able to reflect on Alistair's work by following his blog. AlistairMcClymont.com

Neuro+Music Hack Day 2013 Barcelona, Spain

When and where the activity took place:

The Neuro+Music Hack Day took place on 13th and 14th of June in 2013 in Barcelona, Spain. It took place during the electronic music "Sónar festival".

Who the incubation activity was for:

More than 20 Music Hack Day events have taken place around the world in the last three years. Starting in London, the MHDs have spread across the world. The MHDs have gathered over 2000 participants and a multidisciplinary audience, building hundreds of hacks and gathering over 125 music and tech companies. The Music Technology Group (MTG) of Universitat Pompeu Fabra (UPF) has hosted and organized the MHD in Barcelona since 2010.

What the incubation activity looked like:

The Neuro+Music Hack Day (MHD) was a 24-hour hacking session in which participants conceptualised, created and presented their projects. Any Music Technology, i.e. software, mobile applications, hardware, artworks, web development, could be used as long as it was neuroscience and music-related. The neuroscience track of the Music Hack Day 2013 was proposed by the Science Communication Observatory from Universitat Pompeu Fabra in the framework of the KiiCS project: the special neurotrack aimed at providing a set of useful tools and APIs bringing together music, brain signals, Brain-Computer Interfaces, and other physiological sensors to create and interact with music in new ways. In addition, the Neuro+MHD offered a pre-event introductory workshop where different hardware devices (BCI, Enobio, and other physiological sensors) were made available to participants of the Neuro+MHD. The Neuro+Music Hack Day was organized by the Music Technology Group. The Science Communication Observatory introduced the special neuroscience track in the framework of the KiiCS project. The event had the support of the research group Synthetic, Perceptive, Emotive and Cognitive Systems (SPECS), also from UPF, and of the company Starlab Barcelona SL.

The makers, working in a warehouse inside the Sónar music festival for 24 hours, had access to software for music and caps with sensors that measure brain activity. There were other devices with sensors that collect vital signs such as blood pressure, heart rate, respiration and perspiration from the skin. Two of the best projects of 2013 Neuro+Music Hack Day were given the chance to develop their ideas through a development grant. From April to June, both projects were working on three axes:

1. Technological development, with the assistance of Starlab.

2. Business development, with the assistance of Barcelona Activa (EBN Partner, Local Consortium Member)

3. Education. They will be used as case studies by students of the UPF post-grad programme "Company Management in the Music Industry".

The reasons for doing this activity:

The neuroscience track inside the MHD was a great way to show the extent to which musicbased creativity can be nurtured by the tech and neuroscience community. It brought together the music industry and the developer community and sought to highlight and showcase the platforms and APIs of companies in and around music tech. It sought to fast prototype and create new music apps and to foster cross-platform and cross-device innovation.

How non-participants could engage with the project:

Those who did not participate in the project directly could still reap the benefits of newly designed and developed music technology. The general public was welcome to spectate and observe the events of the Neuro+Music Hack Day.

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Design Workshops Warsaw, Poland

When and where the activity took place:

Design workshops took place in the Copernicus Science Centre from 23-27 September 2013 as part of the Warsaw Health Resort cycle.

Who the incubation activity was for:

Design Workshops were attended by 20 individuals in the field of design, natural science, management and engineering, selected from among nearly 160 applicants. Each of the participants adopted a specific role in one of five project groups, consistent with his/her education. Each of the groups, under the supervision of the trainer and designer Karolina Perrin, followed the route from concept to production. Supported by the knowledge of experts (speeches on design were given by Paweł Balcerzak and Maciej Sobczak, on the sources of funding and marketing concept, by Dawid Sokolowski, on seeking inspiration, by Irena CieĐliĐska) and with a constant guidance on the use of 3D printers, participants defined the problems, came up with ideas and developed a strategy for their implementation.

What the incubation activity looked like:

Each group came up with a ready concept and a prototype for a practical product for the city's inhabitants, as well as an idea for its implementation. They made a diagnosis of urban problems and then worked towards a cure. During the process they were guaranteed a tutor's advice, expert help at making prototypes and working with 3D printers. At the end of the process, each project team had a product that could improve the life of the city's inhabitants: straps to adapt a shoulder handbag into a rucksack; a dice to enable conflict-free distribution of domestic tasks; living jewellery for eco-freaks; stamps - motivators; a board game bonding generations; a reflective phone pouch to be worn on the shoulder.

The most persistent participants were looking for the chance to develop and possibly implement their projects after the workshop with the help from outer commercial partners.

The reasons for doing this activity:

The Design Workshop Series was put on in order to develop projects of products that could improve the functioning of the city and/or life of the city's inhabitants. The workshop brought together professionals from incredibly varied backgrounds in order to collaborate and create a community that believes in development through science and encourages personal engagement in discovering and understanding the world. It increased individuals' ability to cooperate, allowed them to acquire skills to progress from the stage of idea conceptualisation to its implementation, and greater belief in one's own power to initiate positive social change.

How non-participants could engage with the project:

Developed prototypes were presented at the end of the workshop series to individuals who had not participated themselves. This could serve as inspiration for community members not directly involved in the workshop process. Community members could see which projects and prototypes were designed and developed and apply these observations to their own innovative thoughts.

TY Mentoring Programme Dublin, Ireland

When and where the activity took place:

The TY Mentoring Programme ran from 01-16 November 2013 as well as 25 February-01 March 2014 at Science Gallery in Trinity College Dublin, Ireland.

Who the incubation activity was for:

The TY Mentoring Programme is run biannually by Science Gallery in Dublin, whose mission is to ignite creativity and discovery where science and art collide. Science Gallery aims to inspire young people to discover and get involved in science, particularly those in the 15-25 age bracket. In this initiative, the participants •two staff members from Experimentarium were secondary level students in Transition Year (14-16 vears old).

What the incubation activity looked like:

The TY Mentoring Programme was a weeklong immersion into science and careers in the field. It consisted of an in-depth programme of events, hands on workshops, tours and talks with scientists that helped to introduce students to the diversity and interdisciplinary nature of science while also showing the realities of scientific research and careers.

The reasons for doing this activity:

The Transition Year Mentoring Programme gave students the opportunity to immerse themselves in science. Students were given the opportunity to develop and professionals in order to facilitate discussion project ideas for upcoming exhibitions and events, and were mentored by the Science Gallery team and external experts in science, the arts, culture, design, business and innovation. It sought to facilitate interest in science and art, encourage creative and innovative thought processes, and expose TY students to potential career options in the fields of science and art.

How non-participants could engage with the project: Participants are able to discuss their experience at Science Gallery with their peers, facilitating discussion on art and science engagement and igniting interest in those with whom they interact.

Art and Science Workshop Copenhagen, Denmark

When and where the activity took place:

This event took place at the Experimentarium in Copenhagen, Denmark

Who the incubation activity was for:

Experimentarium took the opportunity to include secondary high school students in their development process and invited them to be part of an intensive and creative phase involving staff and artists. The team consisted of

•four artists and their three pieces of art •18 high school students (age 15 - 17) from a science and art line at Gefion Gymnasium (Danish high school)

What the incubation activity looked like:

The team of artists, staff, and students met three times during the development process. The artists and staff members took the opportunity to reflect deeper upon the relationship between art, science and science communication and the work process was directly influenced by the reactions from the students.

The reasons for doing this activity:

This development process brought together students and engagement between art and science among individuals from varied backgrounds.

How non-participants could engage with the project:

Those who did not participate in the development workshop were able to appreciate the art pieces resulting from the incubation process. This would spark questions pertaining to the engagement of art and science and facilitate discussion amongst art spectators.

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'Tell Your Science!' Workshop Series Paris,France

When and where the activity took place:

Four sets of 'Tell Your Science!' workshops were held at Espace des sciences Pierre-Gilles de Gennes (ESPGG), the science culture center of ESPCI ParisTech between June 2012, to October 2013. An additional workshop was held on 14 June 2014 at the Atelier Luce Couillet/Matière Ouverte within a Parisian BIC.

Who the incubation activity was for:

The activity aimed at reframing the relationship of teenagers with science and scientists by having all the interactions revolving around a creative project, more specifically the shooting of a short fiction film. The first target group was therefore young adults, mostly coming from underprivileged areas of the Paris outskirts during their free time. This was made possible through collaboration with two associations working on the field, Association Paris Montagne and Association Science Ouverte. The social inclusion dimension was embedded in the activities thanks to collaboration with another FP7. Science in Society project: SiS-Catalyst. A second target group were scientists: the workshops mobilized several researchers and PhD students from the ESPCI ParisTech labs: SIGMA lab for a workshop on brainmachine interface; LSABM lab for a workshop on chemical analysis; Neurobiology lab for a workshop on memory, and the startup Matière Ouverte for a workshop on new textiles. Writers for theatre and cinema were the third target group. A wonderful effect of this KiiCS-inspired trilogy was that artists worked as facilitators of the teenager-scientists interactions, scientists as facilitators of teenagerswriters interactions, and most surprisingly teenagers were excellent facilitators for the writers-scientists dialogue.

What the incubation activity looked like:

The incubation activities were based on the idea of applying the protocol imagined by film director Michel Gondry (L'usine de films amateurs, or how a group of people that never met before can shoot a film in a few hours), to a science communication workshop involving young adults. In short, young adults were asked to imagine a

scenario for a fiction film on a pre-determined science topic, to then meet scientists, visit labs, and finally shoot a 3-5 minutes short fiction film.

In more detail, each 1.5 days workshop involved: 1) The projection of the film testifying the work of the other member of the B-linked KiiCS cluster 2) An introduction on science, innovation and creativity, exploring the desire and expectations of young adults for tomorrow's world and how science and innovation can shape it 3) The development of scenario ideas 4) A meeting with researchers, motivated by the desire of writing a story 5) Visit to a cutting edge research lab 6) Work with a professional scriptwriter to finalise the scripts 7) Shooting of the short film 8) A collective final discussion

The reasons for doing this activity:

The "Tell your science!" activities demonstrated how starting from a personal questioning on the topics investigated by science and having as the endpoint the shooting of a fiction film can have a very strong "push and pull" effect on the type of interaction that teenagers have with scientists. It confirmed that the access to science as a means to nourish a personal and creative project could provide an extraordinary motivation for learning, and a great attention to the social implications of science.

Moreover, several teenagers greatly appreciated the possibility of combining their true curiosity for science with their interest in film-making, storytelling and new technologies, making the participation to the workshop a particularly unexpected, enriching and enjoyable moment. In broader terms, the activities investigated and tested how a relationship between young adults and science and technology can be based on creative thinking (that is, science and technology as creative sparks and platforms to think about suitable transformations of the world) and on innovation (that is, science and technology as possible tools through which to realize these transformation in a real context).

We conceived the "mise-en-recit" of science, technology and innovation as a process to create an empowered relationship with science and its social impact. In other words, promoting a vision of science as a controllable rather than controlling system. We believe that this is a crucial step in order to promote a spirit of creativity and innovation through science and technology in young.

How non-participants could engage with the project: Developed prototypes were presented at the end of the workshop series to individuals who had not participated themselves. This could serve as inspiration for community members not directly involved in the workshop process. Community members could see which projects and prototypes were designed and developed and apply these observations to their own innovative thoughts.

Partners

Incubation Partners









