

YOUNGSTER FABLAB: INTRODUCING CREATIVITY AND ENTREPRENEURSHIP TO YOUNG PEOPLE

Regional Test Case Documentation

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0. Abstract

Youngster FabLab was a test case implemented to boost creativity as well as technological and entrepreneurial skills. Various formats: on-line and on-spot, interactive and hands-on formula and comprehensive approach made this training program very attractive for young people from the area. The goal of the test case was not only to improve professional skills, but also boost personal creativity by showing the development possibilities. Mix of creativity, technology and entrepreneurship made this action unique on a regional level. Its implementation contributed to build the capacity for further creative development of the city, introduced innovative educational schemes and created a fertile ground for similar initiatives.

1. Introduction

Bielsko-Biała used to be called “the city of hundred industries”. Currently, it is undergoing a successful industrial transformation through technology and creativity. It is now a relevant centre of ICT in the region, and both ICT and emerging industries (including CCI) are indicated as a regional smart specialisation. This placed Bielsko-Biała at the top of middle-sized cities in Poland in terms of development and entrepreneurship. Moreover, both of the dimensions - technology and creativity intermingle. It is visible in various projects, actions and places:

- BBDays4.IT festival - which shows the capacity of ICT sector in the city as well as the added value of cooperation between different quadruple helix stakeholders.
- FabLab Bielsko-Biała - the essence of the implementing test case - we provide various workshops, open days and events related to innovative projects development.
- Interactive Cartoon and Animation Center - the institution that brings the two dimensions together in a very clear way -Cartoon Studio that operated in the city in the past, on nationwide scale with cartoon characters know by every child in Poland, is now developing into modern, interactive center with stunning technological solutions innovative on a global scale

Having the capacity in the city, creative space like FabLab and with the ability of knowledge exchange with InduCCI partners - Youngster FabLab was a natural choice of a test case to implement. Bringing a third dimension of entrepreneurship - next to technology and creativity - it makes a complex, outside-curricula course for young people who have ambition to run a technology related business in the future.

2. Objective

The concept of the program was divided into two parts:

(1) Technological part:

- basics of microcontroller programming and circuit design using the Arduino platform and implementation of own projects using the acquired knowledge.
- basics of 3D printing - introduction to technology - When it all started? How it can be used? What can you create with 3D printers?

(2) Entrepreneurial part:

- technology in business - how to build a company based on technological competence? What does it mean to be entrepreneurial? - new business models, creative project development methods, case studies of business practitioners on the career path related to modern technologies and Industry 4.0

We wanted to fulfil the educational gap with the offer of gaining skills desirable on the future labor market both on the employers as well as employees' side. With bringing this knowledge to young people we improve their professional skills, but also boost their personal creativity by showing the development possibilities. And following that - we build the capacity for further creative evolution of the city, based on technology, boosted with entrepreneurial spirit, tailored to local needs but also relevant on a wider scale.

3. Applied approach

The main overview of the test case concept remains the same from the beginning. It is a three-dimensional complex educational course for young people to build the creative capacity of the city.

FabLab Bielsko-Biała is a creative open space run by ARRSA from 2014 and various technology related actions, workshops and trainings were conducted before. FabLab is equipped with cutting-edge technology of 3D printing, microcontrollers programing, robotics and others. We usually made courses dedicated to one of those. The courses were provided by different target groups, from children through youth to entrepreneurs and even elderly people.

However, we never made such a complex curriculum, with the entrepreneurial spirit. With the InduCCI project we decided to test it with Youngster FabLab pilot action, which was a logical next step for us. With the support of external experts, we added business value by providing the information about new business models and innovative project development methods.

Due to COVID-19 pandemics and related restrictions we were forced to adjust some of our previous plans of implementation:

- we had to minimize the number of participants small groups of participants (especially in 2020 - 3 people per group)
- we had to split the format into more smaller events rather than a big format
- we had to prepare also an on-line format - to have an alternative for physical workshops

To reach the target groups we used different communication channels, which were also adjusted to the format of the event. As pupils and students were at the scope of our interest, we contacted schools and universities directly - through principals, teachers and lecturers. We sent formal invitations as well as arranged bilateral meetings to explain the concept. We cooperated with students' associations to disseminate the information via informal channels. We were also able to take part in the Beskid IT Academic Day.

Technological part of the workshops was prepared with our own resources. We wanted them to be as much practical as possible, that is why all the workshops were organized in a hands-on formula and participants were able to touch the technology. Participants of 2 days' workshops organized in December 2021 were also equipped with special technology sets, so they are able to further develop their skills at home.

For the entrepreneurial part we cooperated with external experts from the business sector. The formula of the workshops was interactive with a focus on case studies presentation, discussion and experience exchange. Not only theory of the business models was presented, but also real life examples, which made the event more interesting.

4. Results

Having regard to the necessary amendments due to COVID-19 pandemic, we ended up with an offer of:

- (1) Arduino programming on-line webinar available on YouTube for a wider audience (05.2020)
- (2) Arduino programming workshops for small group (07-08.2020)
- (3) 3D printing - When? How? What? Who? On-line webinar on a YouTube channel on available 3D printing technologies, materials, history and explanations for what it can be used in terms of business as well as daily life. Synergy with other project - video material prepared in the framework of local initiative "Three-dimensional education" (views aren't counted for the InduCCI project indicator, however the video was used for the purpose of Youngster FabLab) (06.2021)
- (4) Arduino programming workshops for students organized within the formula of a bigger event at the technical university in the city called BITAD - Beskid IT Academic Day (11. 2021)
- (5) Make your project with Arduino set & 3D printing skills - 2 days' workshops after which participants received kits for further development of skills at home (12.2021)
- (6) Youngster FabLab - boost your entrepreneurial spirit - 2 days' workshop (12.2021)

We recommended to participants of single workshops, e.g., Arduino to take part in other forms - watch the webinar about 3D printing or participate in entrepreneurial skills workshop.

Due to the fact that there were remote in time, we gathered e-mail addresses of participants and informed them about the next formats possible to participate.

CCI and entrepreneurs were involved in the implementation of the test case as it was previously planned. From the CCI side we had our FabLab manager, software programmer and Industry 4.0 developer who shared his knowledge and expertise in terms of creative usage of technology and taught how to use it for the future technology-related job in the CCI sector. From the entrepreneurial side we had three experts who shared their tips & tricks in terms of new business models, impactful public speeches and innovative methodologies of business ideas development.

As already mentioned above - due to COVID-19 pandemic we had to change a bit a concept of the implementation. We resigned to repeat the same format few times in favor of more flexible events, adjustable to the current conditions. On-line formats are to be used repeatedly, they were introduced to each group of participants and they will be available still after the project lifetime. With such approach we were able to test more different models of competence building schemes.

Main target group for the workshops were pupils and students - we cooperated with local schools, university and students' science club. We sent the invitations for the workshops as

well as promote it via social media. Participation in the event was decided on a first-come, first-served basis.

As a result of implementation of the test case we can indicate:

- 54 participants of all on-spot Youngster FabLab formats and 89 views of the on-line webinar (counted at a day when creating the report)
- 6 different models of building technological and entrepreneurial competences - on-line and on-spot - program of courses to be used beyond the project timeframe
- being a part of a wider format of technological event - BITAD 2021 - successful cooperation with local technical university

Results of the test case implementation documented in the form of annexes as participants lists, print screens and photos.

5. Goal Achievement and Lessons Learned

The goal set up for the test case was achieved. We provide technological and entrepreneurial workshops for 54 participants; on-line webinar was viewed 89 times. As an added value of the implementation, we consider widening our network of stakeholders with whom we will be able to cooperate in the future - i.e., external business experts and new contacts at the university. Added value for us is also disseminating the information about our FabLab and building community around it. We already have some examples of participants returning after workshops to work on other creative projects at our space.

The objective was also to fulfil the educational gap of skills of the future - with Youngster FabLab we did this and because it was outside official school curricula - it was easier to implement. Students and pupils from the region were able to participate in an innovative educational format, work with cutting-edge equipment and gain technological and entrepreneurial knowledge that can be further developed either as a hobby or in their professional careers.

With regard to the feedback from the participants, such a program is very useful and enables students and pupils with skills relevant for the future - both in terms of technology as well as business ones. We heard in the workshops that business models' explanation and innovative business idea development methods made the knowledge they already have, (e.g., from school) more complex and organized. Small groups and interactive formulas were also much appreciated.

As for improvements or tips & tricks for others who would like to implement similar actions, we would suggest:

- plan on-line and on-spot formats from the beginning and if possible, at the same time - COVID-19 pandemic taught us to participate in various formats on-line, so nowadays it is wise to foresee having both. Organizing them parallel or more condensed in a shorter period of time brings more value and boosts the impact.
- record on-spot workshops and put them available on-line (of course after having all appropriate agreements with participants and experts) - this is something that we haven't done and we regret that. If we did that, we would have video ready to put on-line and make available for a wider audience. Moreover, we would have material for quality control and further improvements of the course.

6. Outlook, Sustainability and Transferability

With Youngster FabLab we created an innovative educational scheme that can be implemented beyond the project timeframe. It can be repeated for various target groups in terms of age, profession as well as geographical area.

It can be easily transferred to other regions - both in Poland as well as abroad. It can be tailored to certain regional needs, e.g., by selecting different technologies.

Our next step will be to use created schemes as a foundation for other projects concepts. Calls for EU funded programs for a new financial perspective have already opened. We would like to apply for new funds to develop further projects related to technological and creative development. At the moment of preparation of the report, we are a partner in the consortium for Interreg Central Europe program 1st call for the project related to development of comprehensive technological and entrepreneurial skills, for young people but also in the train-the-trainer formula to tackle also the level of teachers and lecturers. Youngster FabLab concept will be a foundation for our further considerations and a good practice to be shared within the partnership.

We also already agreed to repeat the action on the academic IT Day 2022 edition.

We are also developing a Digital Innovation Hub within which the Youngster FabLab educational program will be implemented on a daily basis, open to everyone and provided after a sufficient number of participants gather.

7. Annexes

Annex 1 – YFL_technological part_photo

Annex 2 – YFL_entrepreneurial part_photo

Annex 3 – attendance lists

Annex 4 – Arduino webinar print screen from YouTube

Annex 5 – Arduino Webinar Link: <https://youtu.be/IKGQlanOErl>