SparkDigiGirls

EMPOWER GIRLS' CREATIVITY THROUGH USE OF DIGITAL TECHNOLOGIES

Report

OF A TWOFOLD ANALYSIS OF WAYS HOW INNOVATIVE TECHNOLOGIES MAY DEVELOP CREATIVITY OF GIRLS

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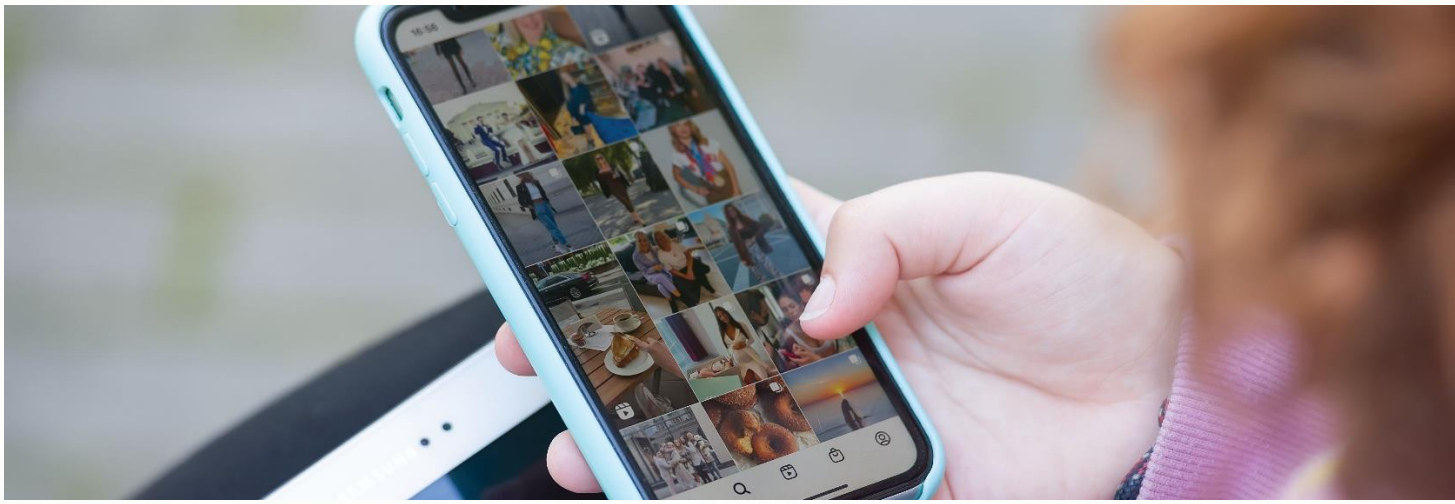
INTRODUCTION

This Report presents key findings of completed two-fold analysis: round table discussions and case studies. The Report specifically focuses on what technologies may impact 13 to 18 years old girls' creativity and suggests ways of how to increase girls' interest in computer science and technology. Moreover, the report clearly sets the learning scenarios and crucially provides a way to help girls build better, more interesting learning experiences through exploring digital technologies and finding creative solutions to given real life situations.

This Report has been developed within the project Empower Girls Creativity Through Use of Digital Technologies (SparkDigiGirls), which is funded by the Erasmus+ strategic partnership in the youth field and implemented in Lithuania, Greece, Slovenia and Portugal. Together with partner organisations the project aims to encourage girls to explore digital technologies such as AR (Augmented Reality), VR (Virtual Reality), AI (Artificial Intelligence), IoT (Internet of things) and come up with new and exciting ideas by utilizing their newly acquired digital knowledge to chart the waters of the male-dominated STEM industry with fresh, different and creative viewpoints.

Over the course of the project the consortium of partners will aim to tackle stereotypes and societal beliefs on gender and technology, strengthen girls' digital literacy skills, open up new opportunities for creativity, and encourage girls to pursue IT or STEM after school. An online training programme tailored to girls' needs will also be set up. Finally, the project will run a campaign of success stories of women in technology, and will invite girls and youth workers to join the project activities.



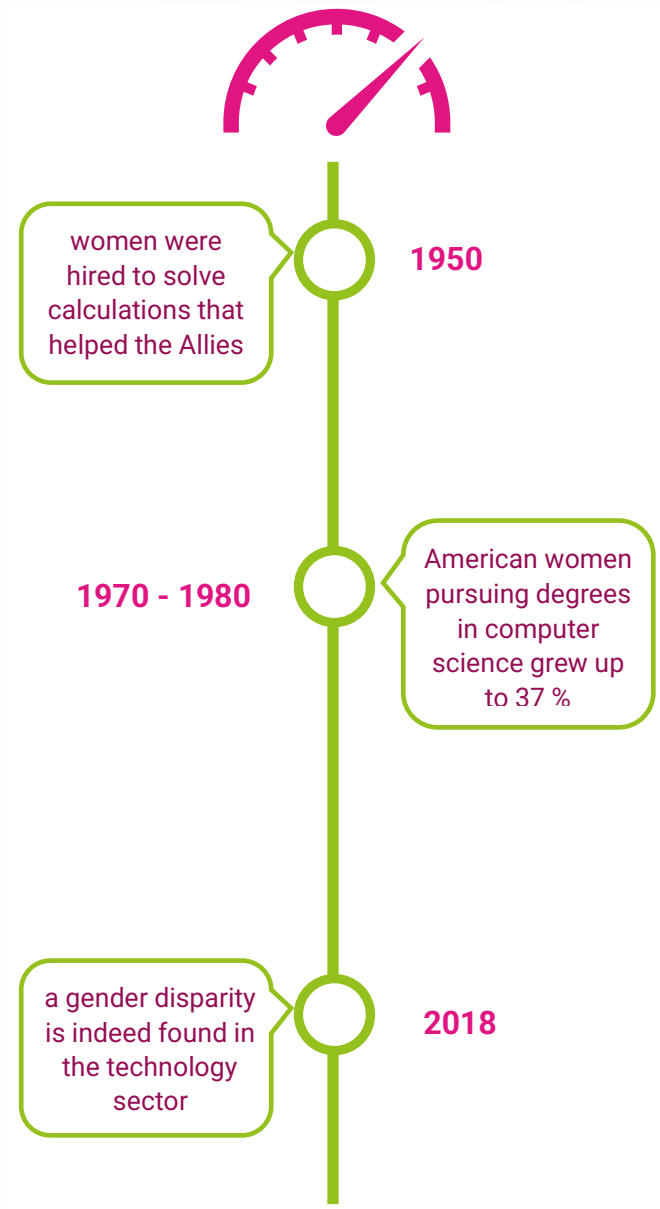
IMPORTANCE OF FEMALE PARTICIPATION IN IT SECTOR

As statistics show, women in technology continue to remain a minority.

During World War II, hundreds of women were hired to solve calculations that helped the Allies. During the 1950s, computer software programming was seen as 'women's work', the alternative to the male vocation of hardware development.

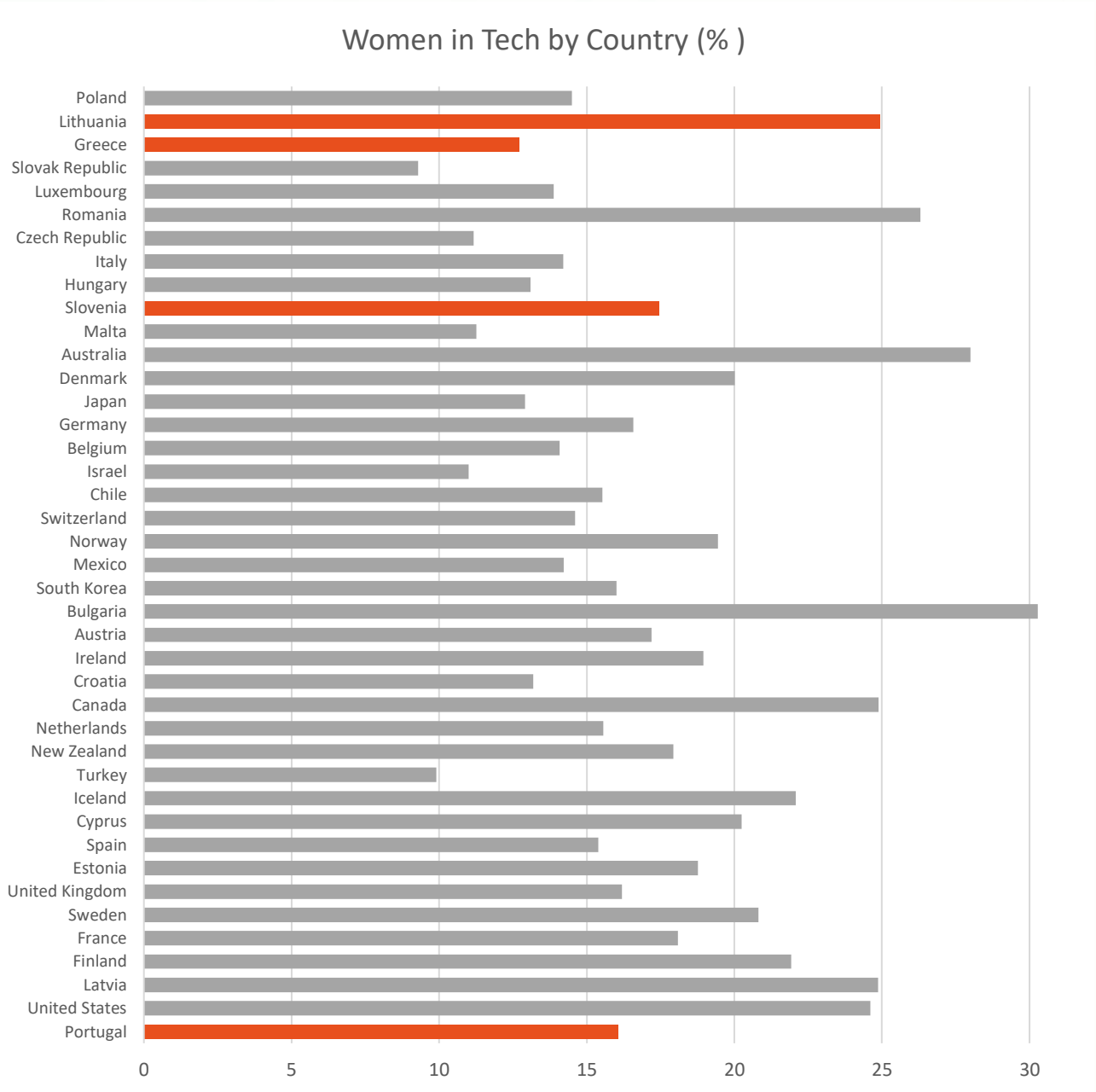
In the 1970s and early 1980s, the number of American women pursuing degrees in computer science grew up to 37 % – nearly double the number recorded in 2015. However, the Silicon Valley's "gold rush" shifted male focus back to software in recent decades. The media also gave rise to the idea of the 'male tech genius' with its limelight on Steve Jobs and Bill Gates, and the number of women working in technology began to decline[1].

The 2018, Women in Tech Index, which covers 41 EU and the Organisation for Economic Co-operation and Development (OECD) countries highlights that a gender disparity is indeed found in the technology sector[2].



[1] Women in Tech by Country, 2019, URL https://www.europeanwomenintech.com/blog/women-in-tech-by-country

[2] 2018 Women in Tech Index, URL https://honeypotio.github.io/women-in-tech/



Data source from: https://honeypotio.github.io/women-in-tech/

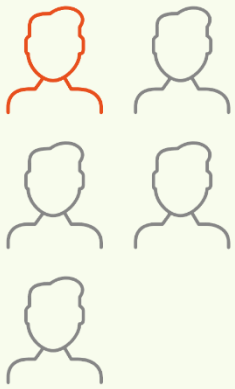
Amongst the participating countries, Lithuania had the highest rate of women in ICT – 24.93 %, with Greece at the bottom – 12.70 %, with 17.49 % and 16.08 % in Slovenia and Portugal respectively.

According to the 2018 Eurostat data, girls and women continue to be under-represented with only 17 % of all ICT students in the EU being women[3]. In 2020 that proportion changed only slightly with 81.5 % ICT specialists in the EU still being men against 18.5 % of women[4].

[3] Girls and women among ICT students: what do we know? URL https://ec.europa.eu/eurostat/web/products-eurostat-news/-/edn-20200423-1

[4] ICT specialists in employment, URL https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT_specialists_in_employment

This disparity remains in place despite an increasing social climate that encourages women not to embrace stereotypes in career choices.



Microsoft's regional survey of 11.500 women reveals that while both girls and boys have similar interest in science, when it comes time to decide on a field of study, five times fewer girls choose science, technology, engineering and math (STEM) fields and fewer than 1 in 5 computer science graduates are women[5]. Female interest in STEM subjects drops far too early. In fact, the OECD's Programme for International Student Assessment (PISA) reveals that boys are far more likely to imagine themselves as ICT professionals, scientists or engineers[6].

[5] Why Europe's girls aren't studying STEM,2017, URL https://news.microsoft.com/uploads/2017/03/ms_stem_whitepaper.pdf

[6] https://www.oecd.org/pisa/

TWO-FOLD ANALYSIS: OBJECTIVES

In order to clearly set learning scenarios in innovative technologies and identify topics most attractive for girls as well as develop partnerships, the following two studies were carried out:

Round Table Discussions (RTD) invited different experts from the ICT-related sector to discuss key factors preventing young girls from exploring career paths in computer science and technology and suggest perspectives on addressing the problem. The discussions addressed various learning experiences, samples of usage of different applications or digital tools in the learning process of youth, including girls.

Four online RTDs were organized in all project partner countries. In total 37 champions from formal and non-formal education institutions, representatives from the IT business sector, local and national government institutions, influential public figures as journalists and opinion makers took part (12 experts in Lithuania, 8 – Slovenia, 9 – Portugal, 8 in Greece) in the events. Diversity of speakers was advised in order to ensure a wide range of views and ideas. Samples introduced in the discussions were documented and used for this Report. In each country a discussion was held on the basis of a developed guide and questionnaire (Annex I). By using this guide, partners collected data from experts about:

- successful training programmes that can involve and empower girls to increase an interest in new and innovative DTs;
- use of concrete innovative technologies by solving real world problems;
- ways of involving girls to choose ICT activities/training and later ICT-related studies etc.

A case study analysis aimed at finding and analysing samples of implemented or current projects used to encourage girls to participate in ICT in four partner countries: Lithuania, Greece, Slovenia and Portugal. This case study helped in bringing the understanding of the issue in depth and extended experience of how technologies, tools can be used in different learning settings for girls.

The case study analysis was carried out in all partner countries – Greece, Lithuania, Slovenia and Portugal. In total, partners collected 32 case studies (Lithuania – 7, Slovenia – 7, Portugal – 11, Greece – 7). As a case study initiative CodeWeek was listed by 3 partners, in Annex II it is presented once. Therefore, in total 30 case studies are presented.

An RTD-based report and a case study is prepared with examples of attractive use of new and innovative technologies including AI, AR, VR and IoT.

SUMMARY OF ROUND TABLE DISCUSSIONS (RTD)

Many interesting ideas and suggestions emerged and were generated during round table discussions. By following the concrete RTD guide and questionnaire (Annex I), a text below summarizes ideas and recommendations made by participants.

Restraining factors and stereotypes affecting low girls' participation and interest in digital technologies

During the discussions, several negative perceptions and stereotypes related to low interest of girls in ICT were highlighted.

Stereotypes about "masculine" and "feminine"

A prevailing stereotype in the broader world of professions that ICT is identified as a male occupation is an important reason for low involvement of girls in the sector. Participants of the RTDs underlined several reasons why boys are more likely to choose STEM-related fields of study.

Stereotypes on "masculine" and "feminine" majors are deeply rooted in society. This entire "cultural legacy" remains a significant factor in the current relationship of women and technology.

> ***"Our society dictates what is expected of a woman and what is expected of a man. From a very young age, even in toy shops, there are already different toys for girls and boys",*** *notices Viktorija Mačiūnė, Quality Assurance Engineer and Developer at Zyro.com from Lithuania.*

> *Another observation made by Carolina Salgueiro, Outsystems Consultant at Nexllence from Portugal, also proves the existence of the mentioned stereotype. She says,* ***"Many modern video games mainly tend to please boys and trigger their interest in an IT career. It turns out that video games are indeed a common denominator for many adult men in the IT field. in stark contrast to women"****.*

Stereotype – ICT is "hard coding"

Another stereotype that was revealed during discussions is related to girls' opinion that ICT is about hardware and programming. Girls do not see IT as a creative but rather boring subject.

> ***"Many girls still think that people who work in IT sit in front of a computer screen from morning to late night and programming. But that is also a myth. Underneath the IT sector there are many different job positions like graphic designers, data analyst, engineers, IT project managers, etc."****, says Renata Danielienė, lecturer at Vilnius Universitv in Lithuania.*

Therefore, it is important to show that by using technology one can not only code, but also create something for example new apps, robots, design graphics for web-sites, games, perform testing of developed programs, work in IT support; develop various IT strategies, manage and implement IT projects.

Insufficient education and lack of curriculum

Majority of RTDs participants agreed that Influencing factors for career choice by girls mostly start at school. The following education-related problems were identified:

- During early education, girls and boys are equally affected by the wonders of science, technology and engineering. However, as adolescents move between primary and secondary schools girls are more likely to choose careers in social, environmental and medical fields as opposed to science, technology, engineering and mathematics;
- Girls and boys often choose their career paths not on the basis of their talents or skills, but according to stereotypical gender roles;
- Girls and boys are dropping out of STEM and ICT studies. For example, INFOBALT analysis[7] revealed that in Lithuania ICT studies do not complete their studies more often than students in any other field of study. Within five years of enrolment, only 53 % of those enrolled in colleges obtained a bachelor's degree and only 59 % - in universities.
- Finally, there is a lack of progress in the context of school curricula.

[7] ICT Specialists in Lithuania, URL - https://investlithuania.com/wp-content/uploads/2018/03/IRT-specialistai-Lietuvoje.pdf

Apart from problems identified above, RTDs participants suggested a number of possible solutions when it comes to teaching ICT. Firstly, embedding ICT within the curriculum from primary through secondary school. Secondly, ICT education should be integrated into all subjects.

***"Girls are persistently underrepresented in computer science at all grade levels at school. Therefore, it is necessary to act from an early age and add the computer science learning subject to the curriculum of 2nd and 3rd study cycles as well as technology subjects at grades 10, 11 and 12"**, says Vânia Ramos, professor at University of Lisbon from Portugal.*

Qualification gap in ICT of teachers in formal education

The teacher is a key to promote girls' interest in computer science and technology. However, there are barriers that discourage teachers from integrating ICT in their teaching in kindergarten and primary/secondary school. Insufficient qualifications in ICT, lack of confidence, effective training, resources were mostly mentioned reasons by RTDs participants.

***"We see a fear of using digital technology among primary school teachers. Different measures should be taken into account to encourage teachers to use ICT with pedagogy"**, says Petra Vanič, Head of the non-formal education and capacity development programme at the Kersnikova Institute in Slovenia.*

At secondary level, the role of computer science teachers is also very important.

***"Teachers should give a chance to the girls to talk about what ICT or STEM looks like for them, what they like or dislike about science, engineering, technology and maths. What careers exist that they have never heard of or considered suitable. What ideas and issues in STEM interest and inspire them?"**, says Laura Grineviciute, director of the Rural Internet Access Points association in Lithuania.*

Lack of female role models

The discussions also revealed that lack of female examples also contributes to girls' low interest in digital technologies. Moreover, dominance of male examples pushes girls away from STEM or computer and science studies. At the same time, public perception of the real diversity of jobs in ICT is rather vague.

> ***"Since many IT positions are rather new there are very few real-life examples and success stories in the girls' environment - family, relatives, friends. Many young people tend to see their future in one field or another on the basis of concrete examples. It is therefore very important to widely publicise stories of female excellence in IT"**, – says Brigita Dane, Project lead at Simbioza in Slovenia.*

Majority of participants agreed that promoting female role models from the IT industry or computer science teachers from school is the best way to address entrenched stereotypes.

> ***"Successful women in the IT sector or ICT educators at school need to be role models girls can relate to, and see themselves being in the future. The more girls get used to hearing about and from women in IT roles, the more normal it will seem"**, says Danguolė Rutkauskienė, President of National Distance Education Association from Lithuania.*

Shifts and changes in recent years

According Eurostat Statistics[8] In 2020, around 8.4 million persons worked as ICT specialists across the European Union (EU). Europe is experiencing a shortage of around one million digital experts[9]. By the end of 2030, the EU will need 20 million ICT professionals, almost twice as many as today. 53 % of enterprises trying to recruit ICT specialists report difficulties in getting qualified people. Therefore, it is essential to encourage more women to participate in the digital economy to tackle this challenge.

Share of women in the ICT sector has been growing as well in recent years. In 2020 in Lithuania the rate of women in ICT was 24,93 % compared to men. Women represented about 17 % of the ICT workforce in Slovenia. According to the Economy and Society Digitality Index 2020, Portugal and Greece continue to have one of the smallest percentages of ICT female specialists in total female employment.

The majority of participants agreed that the recent increase in the number of discussions on the public domain has helped to bring greater focus on the women shortage in the IT sector. A variety of private and public initiatives, research, projects, platforms, articles and stories on media, mentorship programs, workshops and other activities are directed at addressing the problem.

> ***"I have been working in the ICT community for 8 years now and the trend is very good - the number of women in the company is growing very fast, not only in IT but also in management positions. That's very good to see and I don't feel any discrimination at all"**, says Gintarė Dzindzelėtaitė, Social Project Manager at Devbridge firm in Lithuania.*

However, not all the participants shared the same opinion about gender equality in the IT industry. They said it is still a faraway prospect and changes require action in the context of equality of pay and career advancement possibilities.

> ***"Women still do not assume leading roles in IT companies and have lower wages when compared to men in the same position"**, says Maria Helena Monteiro, professor at University of Lisbon from Portugal.*

[8] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT_specialists_in_employment#Number_of_ICT_specialists
[9] https://digital-strategy.ec.europa.eu/en/library/women-digital

Most effective approaches/ ways to increase girls and women interest in technologies

During RTDs discussions, some factors that could increase girls' interest in ICT were highlighted:

Female role models. Having visible female role models sparks girls' interest in ICT careers and helps them to picture themselves pursuing these fields. For example, female IT students could be mentors and good role models, especially in their schools. This would be the kind of real action that would encourage other girls to choose IT. In another example, a person who studies after school and comes to their school with a real example, or gives lectures, just shows that it is possible to study in a real way, to do creative work. Girls and women need to see inspiration and role models.

Practical experience with ICT technologies, products and tools and creativity. One of the effective ways to increase girls' interest in ICT could be creation of opportunities for practical application of new IT technologies, products and tools. The more practical experiences a girl receives during her education – the higher her interest in ICT. Creativity in the classroom could increase girls' interest in ICT as well and should be an integral part of using ICT technologies.

Participants mentioned such practical examples with ICT technologies:

- programming with Scratch – this would be an initial introduction to programming and showing that programming is not as complex as is often thought;
- showing how visual objects (like robotics) can be used enabling them to move objects around, make characters perform certain actions, etc.
- augmented reality – using visuals to create advertisements, interactive publications, school newspapers, promotional material;
- artificial intelligence – to code something tangible using special libraries, e.g. image recognition; artificial intelligence by making music, painting;
- Internet of Things;
- 3D design and many other technologies.

Teachers as mentors and non-formal education. When educators talk to girls about ICT subjects and actively encourage them, girls become more attracted to these disciplines. Non-formal education, academies and educational projects encourage girls to think about studies in ICT. Participants also emphasized the creation of mentoring programmes to cultivate girls' interest in ICT.

Real-life applications. Girls become more interested in ICT once they're able to conceive what they can do with these subjects, how they can be applied to real-life situations and how relevant they might be to their future. The main reason why girls quit from ICT halfway through when they find that they do not see the practical benefits. Therefore, it is important to teach girls not only to play, but also to use technology in a meaningful way, whether exploring or creating.

***"A realistic touch, where girls can try it out and see if it's right for them, could steer them into ICT. Another thing that would be useful - would be mentoring (called "shadowing"), where girls can go to a company and shadow a girl working in that company: see how she performs work activities, see the real workplace, conditions and working atmosphere. There are countless spheres and areas in the ICT sector. There is no need to write code, girls can do other things and discover themselves from a social and humanitarian perspective"**, *says Viktorija Mačiūnė, quality assurance engineer and developer at Zyro.com in Lithuania.*

Who has a responsibility to make these important steps happen and how should we work together to improve the situation?

The responsibility must be both individual and collective:

- Because there is a whole cultural legacy both in the family and in society setting fixed expectations for individual genders;
- Responsibilities on moving on the equality path must be borne by everyone;
- Diversity, whether in the way we welcome people from different fields of study, gender or cultural issues, helps success, promotes innovation, creativity, tolerance and the construction of a more equitable society.

It is important to conclude agreements between public and private entities, creating a dynamic that allows training their teachers and creating updated school curricula.

Different European funding programs offer opportunities for digital skills development. Create regular events that encourage creativity, innovation and entrepreneurship from a very young age.

Also, it is important to diversify technology subject content in coding, IT support, etc. Between 5th and 12th grades, technological classes should be provided constantly.

What exactly could be taught in order to increase girls' interest in digital technologies?

Majority of RTDs participants agreed that the rise of social networks, apps, artificial intelligence, online tools and different devices are becoming easier to create and build something new. For 6th to 12th graders, low code platforms allow creation of mobile and web applications, chatbots, and reactive web apps for any device. Building their data models, workflows, logic and pixel-perfect user interfaces and interactions, and even adding custom code is becoming accessible for a greater number of people than ever.

> ***"Thus, we are witnessing an evolution from "hard skill" languages to intuitive systems, which do not require deep prior knowledge. Low code systems can quickly show results, which can generate extra excitement and boost creativity"**, says Renata Danielienė, lecturer at Vilnius University from Lithuania.*

Free programming languages such as Python are already in use in middle schools and allow for development of skills highly sought in the marketplace. For younger children especially in primary schools Scratch language can be more relevant as it allows build scenarios, stories and games.

Focus on digital marketing and content production, a more communicative approach to technology in combination with cybersecurity concepts such as safe online behaviour is appealing to young girls. While social media is already a norm for most young people, digital marketing can be an opportunity to educate them on privacy, ethics and good online practices. Interpretation of data and statistics also allows us to grasp important concepts in management that can be useful later in life.

There are no learning differences between girls and boys, but as girls are usually more communicative they are more present in the social media. Various educational programmes must foster entrepreneurship, career pathways that may lead to financial autonomy and opportunities for thriving beyond traditional roles.

RTD CONCLUSIONS AND RECOMMENDATIONS

Challenges and constraining factors discouraging participation of girls in ICT

- Negative perceptions and stereotypes about computer science and technology such as “ICT is male occupation” or “ICT is hard coding” affect the way girls interact with ICT.
- A lack of understanding of what is available in the ICT industry putting girls off ICT opportunities.
- Lack of seeing women as role models in STEM or computer science and technology subjects also contributes to girls’ low interest in ICT education.
- Lack of the learning experiences through teachers and the curriculum at school decreases girls' exposure to technology paths and career choices.
- School curricula are lagging behind modern requirements, limiting girls' exposure to technology.
- Insufficient qualifications in ICT, lack of confidence, effective training, resources are barriers that discourage teachers from integrating ICT in their teaching in kindergarten and primary/secondary school.
- Lack of discussions about the IT industry on the public domain such as social media platforms, traditional media channels, events and other initiatives is a factor that discourage girls from participation and interest in ICT.

Suggestions for encouraging girls to participate in ICT and how new digital technologies may develop their creativity

- Increased public focus and information on social media or traditional media, events, initiatives etc. helps raise awareness of the problem and could possibly change girls' perception about ICT or STEM.
- The IT sector should not be associated with programming alone. There are many interesting career opportunities underneath the IT industry, with IT itself being an increasingly creative field. This is where girls can find their place by being hardworking and creative.
- It is very important to set successful examples for children from an early age, and to put a lot of effort into teacher training, not just for IT teachers, but for all teachers. They should have knowledge of how to apply ICT innovatively or in a new way to different lessons, and thus increase children's interest in computer science and technology or STEM.
- A reform of the curriculum has to take place to engage pupils but especially girls in ICT subjects. The learning experiences through teachers and the curriculum could have an important effect to increase girls' interest in ICT/STEM.

- To show that technology can be used to create something new, not just to play with it. By allowing girls to use their imagination and explore technologies like Artificial intelligence, 3D printing, Augmented Reality etc. in real-life examples and practical experiences could encourage girls' interest in ICT.
- Showing and illustrating how technology works in interesting ways, what can be created with technology, whether it's programming like Scratch, computer graphics or any other digital programme or tool.
- Provide a relationship between companies and schools so that children can have an idea about technological career paths.

What learning topics could be involved in the online course for girls

- On the one hand girls should be offered a variety of topics in ICT to choose from. On the other hand girls should have an understanding of specific technologies that are tailored to those topics.
- Topics: Social media, Fashion, Design, Culinary, Buying and selling, Digital music, Websites, Self branding, Banking and finances, Games, Data visualization, Sports, Digital marketing, Cybersecurity and Phishing and etc.
- Digital and innovative technologies: Programming with Scratch, Augmented Reality, Artificial intelligence, 3D printing and design, Robotics, Internet of Things, Blockchain, Cryptocurrencies

CASE STUDY ANALYSIS, PRACTICAL USE OF APPLICATIONS

This part focuses on 30 case studies as provided by partner organizations as well as identification of relevant topics. The case studies are presented in accordance with a special template especially created for this purpose in Annex (II).

All of the partners were encouraged to research available training courses, good practice examples, or projects where innovative digital applications, tools or technologies (including AI, AR, VR and IoT, 3D Printing, Cyber Security and other innovative technologies, that could be used to educate girls creativity) are used. This section outlines several case studies to be employed for teaching girls how innovative technologies can be applied across different sectors.

The case studies were selected using the following criteria:

- **Use of the innovative technology** – preference would be given to the cases where innovative technologies are used;
- **Promoting creativity** – as the project aim is to foster young girls' creativity through innovative technologies priority fell on case studies enabling exactly that;
- **Usability for training material** – since the consortium does not aim to create learning materials from zero, but to adapt existing material to the project's specific needs.

Summary of case studies

No	Title	Use of innovative technology	Promotes creativity	Usability in the project*	Type of technology (ies)
1.	Training in 3D Printing, Innovation and Creativity	✓✓	✓✓✓	✓✓✓	3DP
2.	Augmented Reality for business opportunities	✓✓✓	✓✓✓	✓✓✓	AR
3.	Entrepreneurial Skills for Woman in A Digital World	✓	✓✓	✓✓	Digital tools for project implementation
4.	Code Week initiative	✓✓	✓✓✓	✓✓✓	Visual programming, creative coding
5.	Challenge on Informatics and Computational Thinking (BEBRAS)	✓	✓✓	✓✓	Computational thinking
6.	Machine Learning for Music and Art	✓✓✓	✓✓✓	✓✓	AI (Machine learning)
7.	The basics of 3D modelling and the principles of 3D objects	✓✓	✓✓✓	✓	Computer design, 3D modelling and printing
8.	Girls Do Code	✓✓	✓✓	✓	Coding
9.	Light / Workshop for girls	✓✓	✓✓✓	✓	Programming
10.	RampaLab	✓	✓✓✓	✓	Biotechnology, biology, digital media, wearable technology, sound, environment, robotics, energy, alternative energy, etc.
11.	ČIPke	✓	✓✓✓	✓	AI, Sensorics, Coding
12.	Digital summer school for girls and boys	✓	✓✓✓	✓	Coding, technology engineering
13.	Robotics	✓✓	✓✓✓	✓	Robotics
14.	Plug-in Mentoring for Girls	✓	✓✓	✓	Data, Security, Product, Mobile
15.	GEN10S Portugal	✓✓	✓✓✓	✓	Programming

No	Title	Use of innovative technology	Promotes creativity	Usability in the project*	Type of technology (ies)
16.	Portuguese Women in Tech	✓	✓✓	✓	
17.	Girls in Tech	✓	✓	✓	
18.	Programming and Robotics Clubs	✓✓	✓	✓	Robotics
19.	Geek Girls Portugal	✓	✓	✓	
20.	Digi Girlz (Microsoft)	✓✓✓	✓✓✓	✓	Robotics; programming, artificial Intelligence, gaming
21.	PrograMaria	✓✓	✓✓	✓	Programming
22.	Girl in ICT Week	✓✓✓	✓✓✓	✓✓✓	Robotics; programming, artificial Intelligence, gaming
23.	10 EX.I.T.E CAMP (IBM)	✓✓✓	✓✓✓	✓✓	Robotics; programming, artificial Intelligence, gaming
24.	Exploiting Ubiquitous Computing, Mobile Computing and the Internet of Things to promote Science Education (UMI-Sci-Ed (H2020 / SEAC))	✓✓✓	✓✓✓	✓✓✓	Ubiquitous, Mobile and IoT (UMI) technologies
25.	CrowdDreaming: youths co-create Digital Culture (CDDC)	✓✓✓	✓✓✓	✓✓✓	Content based learning, AR, VR
26.	Videogames 4 Teachers	✓✓	✓✓✓	✓✓✓	Educational Videogames and mobile apps
27.	Boosting Global Citizenship Education using digital storytelling	✓	✓✓✓	✓✓	Online Tools
28.	Competence development of STE(A)M educators through online tools and communities	✓	✓✓	✓	Online Tools and communities

No	Title	Use of innovative technology	Promotes creativity	Usability in the project*	Type of technology (ies)
29.	Training the Educators to facilitate the Teaching and Assessment of Abstract Syllabus by the use of Serious Games-CrAL	✓	✓✓✓	✓	Online tools, multimedia
30.	Creative Audiovisual Lab for the promotion of critical thinking and media literacy	✓✓✓	✓✓✓	✓✓✓	3D design and Printing, digital online tools, Arduino, CAD, Apps

** Contribution to education training*

Legend: ✓✓✓ Greatly satisfied

✓✓ Satisfied

✓ Somewhat satisfied

CASE STUDIES CONCLUSIONS

- Most of the case studies feature a high level of creativity in different forms and ways. The SparkDidiGirls project can adapt and integrate a number of suggested ways for exposure of creativity.
- At the same time, majority of case studies focus on robotics, coding, gaming activities in terms of technology use, however, there is a shortage of use in practice of other technologies such as AI, AR, VR and IoT, 3D Printing and Cyber Security.
- The SparkDigiGirls project can take an advantage and develop a new training framework aimed at empowering girls' interest in the tech sector through modern tools offered by Augmented Reality, AI, IoT, 3D, etc.

ANNEX I. ROUND TABLE DISCUSSION GUIDE AND QUESTIONNAIRE

1. Introduction

The SparkDigiGirls project plans to hold a round table discussion (RTD) of experts to discuss key factors preventing young girls from exploring career paths in computer science and technology and perspectives on addressing the problem. The discussion will specifically address experiences, including those of applications or digital tools in the learning process of youth including girls. As a result of the RDT it is expected to collect data from experts on: i) existing successful training programmes which could engage and empower girls to increase interest in new and innovative DTs; ii) use of concrete innovative technologies in their daily lives by solving real world problems; iii) ways of involving girls to choose ICT activities/training and later ICT, STEM related studies etc.

At least four RTDs will be organized in all project partner countries (at least 1 RTD/per country). In total 30 digital or IT sector experts (at least 8/per country) will be invited to participate in the discussions. The gathered data will be documented and used for the project activities as the report (O1-A3), curriculum (IO2) and online training course (IO3) development.

This guide therefore provides a clear instruction of how a roundtable discussion should be organized in each partner country.

2. Target group

Organizers of the RTD will invite experts proficient in the issue and committed to encouraging women to pursue careers in this area. They may represent IT companies, formal educational institutions such as universities, schools, different youth NGOs, career, community centres, local and national governments or even influential public figures. Diversity of speaker affiliations is advised in order to ensure a wide range of views and ideas.

3. Agenda

A round table discussion should last no longer than 1 ½ hours. Each partner organization assigns a facilitator for the RTD. The facilitators should lead the discussions in order to ensure maximum involvement of all participants and exchange of ideas. Typically, no direct action will take place at the meeting other than the addressing questions identified.

3.1. Welcome [2-5 minutes]

The facilitator welcomes participants, thanks for coming, introduces her/himself as the host of the meeting, asks each speaker to introduce her/himself by saying name, occupation, and one-sentence about what makes them an expert on the subject.

Introduction of the topic [5 minutes].

Then, the topic should be introduced for the speakers by providing brief information about the project, interesting facts, statistics that illustrate why empowering girls and their interest in digital technologies is important. Facilitator also explains expectations, objectives of the RTD, provides schedule, timing and ground rules of the discussion.

3.2. Questions [60 minutes]

The remaining time should be divided into three parts of 20 minutes each, as there are three key questions identified. The order of the questions can be used as provided in the questionnaire. It has to be an open discussion in order to capture speaker's opinion, ideas or suggestions. Each question has several supporting questions so that facilitator can stimulate discussion.

3.3. Closing remarks [5 minutes]

Finally, the discussion should end by thanking participants in a quick five-minute wrap including mentioning that all contributions from speakers will be considered to help to design a solution for empowering girls to use digital technologies. As soon as the report is prepared it will be shared speakers to keep them informed and engaged even after discussion is over.

Ideas shared during the discussions should be compiled, translated into English and answers provided in an online form (it will be prepared and sent to the partners) to project partner Information Technologies Institute in Lithuania for following analyses.

4. Logistical suggestions for RTD organizers

RTD can be organized in two ways: in-person and virtual format. Each partner organization makes the decision of the number and format for RTD.

Few important logistical aspects while organizing RTD:

4.1. In-person roundtable discussions

- While speakers are gathering it is suggested to organize a small coffee break for RTD participants;
- It is advised to arrange chairs in a circle by leaving a space between each chair;
- To take care of recording device and do not forget to ask for participants permission to record RTD.

4.2. Virtual roundtable discussions

- This format is accessible but requires more preparation in order to avoid distracting technology issues and awkward conversation;
- RTD organizer chooses platform for virtual RTD (for example, Zoom, TEAMS, etc.);
- It is very important that facilitator manages time carefully.
- Before the RTD facilitator explains rules (asks to turn on cameras, mute microphone while not speaking, asks for recording permission, etc.)

4.3. General recommendations for in-person and virtual RTD

- It is recommended for the facilitator to maintain non-judgmental approach to the speakers and their viewpoints;
- It is important not to allow some participants to dominate the discussion and ensure that all participants express their views.
- All opinions should be respected.

5. Recording of the round table discussion

It is recommended to record the group discussion or have an extra set of hands to transcribe the major points and outcomes.

6. Timetable for conducting RTD in all partner countries

Activity	Deadline	Responsible partner
To prepare for a RTD in all partner countries	30th of June, 2021	All partner organizations
To conduct RTD in all partner countries	20th of August, 2021	All partner organizations
To provide form for compiling all RTD results	30th of June, 2021	RIAP and ITI
To compile, translate all the answers into English and provide them to an online form	30th of August, 2021	All partner organizations

7. The Questionnaire

Discussion Question #1 What hindering factors affect low girls'/women participation and interest in digital technologies?

Supporting questions:

- Since you work in IT-related area, have you seen any notable shifts take place?
- What has changed in recent years, for better or worse?

Discussion Question #2 What are some of the most effective approaches/ways to increase girls and women interest in technologies?

Supporting questions:

- What are the top goals or priorities that need to be worked on together;
- Who, in particular, do you believe has a responsibility to make these important steps happen?
- How should we work together to improve the situation?

Discussion Question #3 Do you know any concrete samples of the projects, initiatives, learning programs that increased girls and women interest in technologies?

Supporting questions:

- What exactly could be taught in order to increase girls' interest in digital technologies?
- Could you think of any example of possible use of new technologies as VR, AI, 3D printing, etc.

ANNEX II. CASE STUDIES

Lithuania

Partner Name and Country: **Information Technologies Institute**

Name of Case Study: **3D printing, innovations and creativity**

Case study No 1	**http://3d-p.eu**
Title of course, trainings, project, initiatives etc.	**Training in 3D Printing to Foster EU Innovation & Creativity *(3DP)***
Type of the case (course, trainings, project, initiatives etc.)	It is a project. One of the main results of the project is online training course.
Sector (like medicine, architecture, IT)	IT, Engineering, Business
Area of technologies (like AI, AR, VR, IoT etc.)	3D printing
Target group	VET students, youth and adults, providers, companies using 3D printers or public institutions
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	3D printing technology was gaining in popularity and became applicable in many fields, including industry, medicine, electronics or architecture. All this translated to the increased market demand for employees having skills or qualifications in this respect.

	The 3DP project was the answer to this demand with its main aim being developing 3D printing courses for VET students and building an e-learning platform for anyone wishing to acquire 3D printing skills. The main objective of the project is to increase the 3D printing skills proficiency: the project aims to give people the opportunity to develop their skills in 3D printing and to acquire the knowledge that allows them to activate in this field, like employee, entrepreneur, trainer, intermediary, etc. The partners developed a 3D printing curriculum with courseware, a trainer guideline and an e-learning platform. They are available in 6 languages (English, Spanish, Italian, Polish, Romanian and Lithuanian), free and open to all. The training courses could be implemented in formal and non-formal study programs and courses. The project was selected as a Good Practice Example: https://ec.europa.eu/programmes/erasmus-plus/projects/eplus-project-details/#project/2016-1-RO01-KA202-024578
Main focus: topics or modules	Curricula for 3D Printing courses was designed to allow personalization depending on the type of trainee: 3D-P Beginner user (15 h); 3D-P Intermediate user (25 h); 3D-P Advanced user (40 h) The Output includes 13 chapters on topics relevant to 3D printing and related fields: 1. Introduction to 3D printing; 2. Available 3D printing technologies; 3. 3D Printing equipment; 4. 3D CAD modelling software applications; 5. 3D CAD modelling using Autodesk 360 Fusion; 6. Select a STL model from online repositories; 7. Check and correct STL file using dedicated software; 8. Obtain the physical model using services offered by 3D Printing providers; 9. 3D Printing an object on a low-cost filament deposition based printer; 10. 3DP and entrepreneurship; 11. Design with 3D printing in mind; 12. Case studies in the industry to show the potential for boosting; Entrepreneurial spirit, creativity and innovation; 13. Future of 3D printing technologies.

	3D Printing courseware is available in 6 languages (English, Spanish, Italian, Polish, Romanian and Lithuanian), free and open to all, on https://3d-p.eu/.
Learning outcomes	The 3DP outcomes are equipping VET students with new key competencies specific for 3D-P, competencies that are not available in the existing VET curricula. The main project's results are the 5 IOs developed: Guidelines and case-studies on the use of 3D-P in VET education; Curricula of 3DP course; 3DP courseware; 3DP trainer guidelines; 3DP learning management system (e-learning)
Methodology (if applicable)	Partners prepared 3DP trainer guidelines which support and educate teachers and make the introduction of 3D printing in to the classroom a simple process.
Organizing institution	Ludor Engineering – Iasi, Romania (coordinator)
Language(s)	The course and the platform were available in six languages: English, Romanian, Spanish, Italian, Polish and Lithuanian
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	09.2016 – 08.2018
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **Augmented Reality for business opportunities**

Case study No 2	www.camis.pub.ro/index.php/en/home
Title of course, trainings, project, initiatives etc.	**Augmented Reality for Technical Entrepreneurs ARTE**
Type of the case (course, trainings, project, initiatives etc.)	It is a project. One of the main results of the project is online training course.
Sector (like medicine, architecture, IT)	IT, engineering, business,
Area of technologies (like AI, AR, VR, IoT etc.)	AR: Augmented Reality
Target group	Undergraduate and Postgraduate students, adults/professionals interested in Continuous Professional Development training programmes and young Aspiring Entrepreneurs keen to learn and exploit AR technology.
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	It is well known that creativity and innovation are key drivers to economic growth. These trends reflect a need that entrepreneurial education and training should also focus on exploiting digital technology to help foster related entrepreneurial business opportunities. One emerging digital technology which can offer a host of exciting and novel business opportunities is 'Augmented Reality (AR)'. The concept of augmented reality i.e. superimposing computer-generated information over real-world scenes/images is slowly being exploited as a novelty in several business scenarios. The aim of the project was to develop a new training framework aimed at empowering students with skills for increased employability through modern ICT tools offered by Augmented Reality. The consortium of the ARTE project developed a common structure, curriculum and content for the interdisciplinary teaching module aimed at Science/Engineering/Business Higher Education stakeholders. In addition, the content could be embedded into existing Continuous Professional Development (CPD)

	programmes organized by business associations and Chambers of Commerce to help rapidly diffuse knowledge on AR-based entrepreneurship.
Main focus: topics or modules	The training addresses **transversal competences** including fundamental business skills and ICT/security besides the more focused training on technical fields (e.g. engineering and science AR examples). These competences collectively enhance the young graduates employability and entrepreneurial skills.
Learning outcomes	As an outcome of the curriculum, learners will acquire interdisciplinary knowledge related to augmented reality and business. Project Objectives . Developed the ARTE training framework that supports students in acquiring entrepreneurial skills related to and exploiting AR technology; . Developed an innovative interdisciplinary teaching module (AR & Business Fundamentals training material, course support, website, case studies, etc.); . Developed the test the innovative ARTE.
Methodology (if applicable)	-
Organizing institution	University Politehnica of Bucharest (coordinator)
Language(s)	Courseware developed in English, Romanian, Icelandic, Lithuanian. Training course available http://www.camis.pub.ro/artem/
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	2014-2016
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **Entrepreneurial Skills for Woman in a Digital World**

Case study No 3	www.e4w.eu
Title of course, trainings, project, initiatives etc.	**Entrepreneurial Skills for Woman in a Digital World - E4W**
Type of the case (course, trainings, project, initiatives etc.)	It is a project. One of the main results of the project is online training course.
Sector (like medicine, architecture, IT)	IT, business
Area of technologies (like AI, AR, VR, IoT etc.)	Digital tools for projects implementation
Target group	Disadvantaged woman and educators working at non-formal adult education institutions
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Today knowledge-based economies require people with higher skills. Problem solving, teamwork, creativity, organization, communication, leadership and digital competences are some of the core importance soft skills for current European labour markets. Project aimed at developing entrepreneurship educational pathway for disadvantaged women through applying project-based integrated ICT learning approaches in non-formal adult education institutions. During two years project new programmes were developed and tested with the educators of non-formal adult learning organizations and women who would like to improve their project management and ICT skills. This programme differs from predominant courses as the project strategy is focused on the implementation of entrepreneurial learning by linking three relevant competence areas together: digital skills, entrepreneurial thinking and project management competences. Moreover, the programme offers content, which

	enhances not only skills required for the current labour market but also builds women self-confidence, provides them an opportunity to discuss problems with others, exchange viewpoints and enjoy themselves in dealing with new knowledge.
Main focus: topics or modules	Project Consortium developed three courses: . Initiating a Project; Making ideas happen; Introduction to the projects and their management; Ideas and opportunities. Choosing an Entrepreneurial Idea; Organising project-related Information. Storage of project files; Planning a Project; Defining a Project: Stakeholders Analyses; Defining project: Project Scope of Work Document and SMART objectives; Planning project: Work Breakdown Structure; Planning project: Gantt Chart; Planning project: Resources; Project Planning Process: Budget; Presenting and closing a Project; Copyrights and Creative Commons licenses . Developing digital content; Presenting a Project. Closing programme Making Ideas Happen.
Learning outcomes	During the project Learning concept was designed and implemented. The learning concept clearly set the pedagogical strategy to capacitate educators of adult non-formal education to develop their entrepreneurial skills to facilitate disadvantaged woman in personal development and employability.
Organizing institution	Association Rural Internet Access Points, Lithuania (coordinator)
Language(s)	English, German, Lithuanian, Greece, Slovenian
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	2018-2020
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	3

Name of Case Study: **Code Week initiative**

Case study No 4	https://codeweek.eu/training
Title of course, trainings, project, initiatives etc.	**CodeWeek Learning bits**
Type of the case (course, trainings, project, initiatives etc.)	Initiative. Free training materials and online courses provided on the initiative website
Sector (like medicine, architecture, IT)	IT
Area of technologies (like AI, AR, VR, IoT etc.)	Visual programming, creative coding
Target group	Training courses for three categories of pupils: In the primary school; In the lower secondary school; In the secondary school.
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Short descriptions on the website helping teachers to involve pupils and students in Code Week project activities and encourage young people to master the basics of coding and computational thinking. The EU Code Week is a grass-roots movement celebrating creativity, problem solving and collaboration through programming and other tech activities. The idea is to make programming more visible, to show young, adults and elderly how you bring ideas to life with code, to demystify these skills and bring motivated people together to learn. EU Code Week is run by volunteers. One, or several, Code Week Ambassadors coordinate the initiative in their countries, but everyone can organise their own activity and add it to the codeweek.eu map. EU Code Week was launched in 2013 by the Young Advisors for the Digital Agenda Europe. The European Commission supports EU Code Week as part of its strategy for

	a Digital Single Market. In the Digital Education Action Plan the Commission especially encourages schools to join the initiative. Every year in October organisations and training institutions especially schools are encouraged to join CodeWeek initiative. Initiative usually lasts for 2 weeks. Initiative organisers are seeking to involve more participants, for this purpose they publish various creative and innovative learning bits and free online courses, which can be used by the Code Week events' organisers.
Main focus: topics or modules	**Learning bits:** No previous coding or programming experience is needed, and each module takes only around 15 minutes to complete. The modules introduce you to key concepts related to coding and computational thinking activities. In addition, the modules also give you practical tips and advice on how to integrate the concepts in your classroom. . Coding without digital technology (unplugged); Computational thinking and problem solving . Visual programming – introduction to Scratch; Creating educational games with Scratch; Coding without digital technology (unplugged); Developing creative thinking through mobile app development; Tinkering and Making; Coding for all subjects; Making an automaton with a micro:bit; Creative coding with Python; Coding for Inclusion; Coding for sustainable development goals; Introduction to Artificial Intelligence in the classroom; Learning in the Age of Intelligent Machines; Mining Media Literacy **Free online courses** **The introductory "Icebreaker" course** The CodeWeek Icebreaker course is a five-hour course in English that targets anyone interested in the basics of coding and computational thinking. The participants learn how to inspire curiosity and an innovative spirit in young people, while empowering

	them to become digital creators. The course helps participants to discover the benefits and relevance of computational thinking and coding in our everyday lives. It also provides ideas, free training materials and resources to organise fun and educational activities for children, anytime, anywhere – especially during Code Week. **The in-depth "Deep Dive" course** The EU Code Week Deep Dive online course is a twenty-five-hour course in English that offers teachers the opportunity to get familiarised with coding related principles and gain the knowledge and confidence to organize easy and fun, interactive coding activities with their students. Teachers discover EU Code Week's free resources and training materials available in 29 languages, and particular aspects of coding, such as computational thinking, unplugged activities, and the endless possibilities of robotics, tinkering and making, visual programming languages, app creation and much more.
Learning outcomes	Motivated pupils and students, during events get understanding about programming and coding concepts, understanding how technologies work and how programming and coding could be fun activity.
Methodology (if applicable)	Methodology for each learning bit and online course is prepared.
Organizing institution	A grassroots initiative run by volunteers and supported by the European Commission.
Language(s)	Most European languages
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	Initiative started in 2013. 2013-2021
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **Challenge on Informatics and Computational Thinking**

Case study No 5	www.bebras.org
Title of course, trainings, project, initiatives etc.	**Berbas (International Challenge on Informatics and Computational Thinkin)**
Type of the case (course, trainings, project, initiatives etc.)	Initiative. Free training material provided on the initiative website
Sector (like medicine, architecture, IT)	IT
Area of technologies (like AI, AR, VR, IoT)	Computational thinking
Target group	There are different task sets for different age students. Five age groups are suggested: Little Beavers – age 8 to 10; Benjamins – age 10 to 12; Cadets – age 12 to 14; Juniors – age 14 to 16; Seniors – age 16 to 19
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Bebras is an international initiative aiming to promote Informatics (Computer Science, or Computing) and computational thinking among school students at all ages. Participants are usually supervised by teachers who may integrate the Bebras challenge in their teaching activities. The International Bebras challenge on Informatics and Computational Thinking involves more and more countries yearly. The Bebras network has over 40 countries. The Bebras Challenge is implemented by the national Bebras Challenges in all the countries that joined Bebras, usually the second week of November. Some countries run the second round in January – February. Each country chooses tasks from the Bebras task pool approved by the annually organized international task workshop. The idea of the Bebras competition on Informatics was proposed by Prof. Valentina Dagienė of Vilnius University. Joining the Bebras initiative and network for a country consists mainly of two parts: organise the national challenge in the country and participate to the International Task

	Workshop. The first step to join the Bebras challenge is to get in touch with the executive body of the Bebras community and ask permission to participate to the International Task Workshop as an observer. Aims and scope: To cultivate students' creativity, information; culture, algorithmic and computational thinking; to facilitate a deeper understanding of information technology; to encourage students to use information technologies in their learning activities more enthusiastically; to engage children in information technologies, computers, and their application from the very beginning at school; to reveal to students the advantages of information technologies that are helpful in learning various subjects.
Main focus: topics or modules	A good Bebras task should: represent informatics concepts; stimulate computational thinking; motivate learning informatics; open a new knowledge area for students; facilitate a deeper understanding of technology: be short and solved within 3 minutes; present information independently from specific software; be interesting and funny
Learning outcomes	The challenge is performed at schools using computers or mobile devices. Examples of tasks are provided here: www.bebras.org/examples.html
Organizing institution	Vilnius University, Lithuania
Language(s)	English
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	The first Bebras contest was organized at 21 October, 2004 in Lithuania. 2004-2021
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	4

Name of Case Study: **Machine Learning for Music and Art**

Case study No 6	https://magenta.tensorflow.org
Title of course, trainings, project, initiatives etc.	**Make Music and Art using Machine Learning**
Type of the case (course, trainings, project, initiatives etc.)	An open source research project
Sector (like medicine, architecture, IT)	IT, music
Area of technologies (like AI, AR, VR, IoT etc.)	AI (Mashine learning)
Target group	
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	An open source research project exploring the role of machine learning as a tool in the creative process. Magenta Studio is a collection of music plugins built on Magenta's open source tools and models. They use cutting-edge machine learning techniques for music generation. These tools are available both as standalone applications and as plugins for Ableton Live. Magenta Studio lets you experiment with open source machine learning tools, standalone or inside Ableton Live. Magenta provides a pretty graspable way to get started within a field of research that can get a bit murky. By giving you easy access to machine learning models for musical patterns, you can generate and modify rhythms and melodies. Magenta Studio has a few different tools. Many are based on MusicVAE – a recent research model that looked at how machine learning could be applied to how different melodies relate to one another. Music theorists have looked at melodic and rhythmic

	transformations for a long time, and very often use mathematical models to make more sophisticated descriptions of how these function. Machine learning lets you work from large sets of data, and then not only make a model, but morph between patterns and even generate new ones – which is why this gets interesting for music software.
Language(s)	English
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	2017-2021
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **The basics of 3D modelling and the principles of 3D objects**

Case study No 7	https://amb.lt/regionas/lt/naujienos/traku-viesojoje-bibliotekoje-sekmingai-igyvendintas-projektas-3d-as-dizainas-darbas-dialogas/148
Title of course, trainings, project, initiatives etc.	**3D me: design - work - dialogue**
Type of the case (course, trainings, project, initiatives etc.)	Trainings
Sector (like medicine, architecture, IT)	IT
Area of technologies (like AI, AR, VR, IoT etc.)	Computer design, 3D modelling and printing
Target group	Youth

Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	The project aims to reduce social, digital and information exclusion through the development of innovative services, and to promote the employment, development and community participation of young people who are active, curious, but with limited financial and technological means. The training was relevant and then practically applicable, both in everyday life and in the pursuit of careers. The duration of training is 50 academic hours teaching participants to work with software - Adobe Photoshop Elements for photo editing and Sketch Up for modelling and 3D printing. The training was conducted by professionals in their field - competent and youthful lecturers. Participants received descriptions how to perform practical tasks, and together with lecturers edited pictures and photos, created 3D models. The trainings took place in Trakai Library (Lithuania).
Main focus: topics or modules	The content of the training programme introduced the basics of 3D modelling and the principles of 3D objects, explored the interface and control of 3D graphics, presented the basic methods and techniques of object construction, and introduced the basic editing tools, operations, and the basics of texturing. Participants learned how to use and apply the tools that are commonly used to process photographs before they are submitted to the press, prepared for documents or uploaded to websites, and, working with layers, how to apply various effects, retouch photographs and create photo montages.
Learning outcomes	Participants created bookmarks for books and created 3D models. Bookmarks and 3D models were printed and were exhibited in the "Library of the Future" exhibition.
Organizing institution	LTD Softex and IT Akademija (non-formal education training center)
Language(s)	Lithuanian
Duration (if applicable) *If the project is ended, the recommendation*	2016 (duration 3 months)

no later than 5 years, but you can provide older projects	
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Slovenia

Partner Name and Country: **Simbioza Genesis, Slovenia**

Name of Case Study: **Girls Do Code**

Case study No. 1	https://simbioza.eu/projekti/partnerski-projekti/girls-do-code
Title of the programme or course	**Girls Do Code**
Type of the case (course, trainings, project, initiatives etc.)	Project
Sector (like medicine, architecture, IT)	IT
Area of technologies (like AI, AR, VR, IoT)	Coding
Target group	Girls 10 -11 years old
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	The shortage of girls and consequently women in IT is a well-documented and well-known problem. Although the basics of programming are becoming part of functional literacy and the demand for STEM, talent is growing rapidly every year, most girls lose interest in computing between the ages of 13 and 17. Aim of this project is to offer girls aged 10 and 11 years old the opportunity to learn the basics of programming and logical thinking for free in the Code.org environment.
Main focus: topics or modules	Girls will acquire basic knowledge of programming concepts such as algorithms, loop, event, condition, function, etc. They will reinforce each newly acquired concept with visual tools in the Code.org environment. The programming course will also introduce them to the components of a computer and teach them about the digital footprint and online security (publishing personal data, images, securing passwords, etc.).
Learning outcomes	They will acquire basic programming skills and develop ICT skills.
Methodology (if applicable)	Coaching and mentoring, non formal educatiion
Organizing institution	Simbioza Genesis, Celtra, Digital School
Language'(s)	Slovenian

Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	School year 2020/2021
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	4

Name of Case Study: **Light / Workshop for girls**

Case study No. 2	https://404.si/dogodek/lucka-delavnica-za-dekleta
Title of the programme or course	**Light / Workshop for girls**
Type of the case (course, trainings, project, initiatives etc.)	Workshop
Sector (like medicine, architecture, IT)	IT
Area of technologies (like AI, AR, VR, IoT)	Technology, programming skills
Target group	Girls 8-15 years old
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Aim of this project is to offer girls aged 8 and 15 years old the opportunity to develop technology and programming skills but also get knowledge of technical solutions and encourage their creativity. They got knowledge from Slovenian Engineer of the year (Dora Domajnko) who is an outstanding young engineer, a PhD student at the Faculty of Electrical Engineering at UL and a development engineer at RLS Measuring Techniques in Slovenia.
Main focus: topics or modules	In addition to getting new technological knowledge each of them made her own lamp. It is a light that shines in all the colors of the rainbow. They explored all the parts of the lamp, from the code and the chip and all the materials that went into building it. Furthermore, they explored the workshops, the machines and the projects that the girls and boys had already made within their organization.
Learning outcomes	They acquired code skills, develop ICT skills and develop creativity

Methodology (if applicable)	Coaching and mentoring , non formal education
Organizing institution	Youth Technology Centre 404
Language'(s)	Slovenian
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	Year 2019
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **Code week**

Case study No. 3	https://dihslovenia.si/codeweek
Title of the programme or course	**Code week**
Type of the case (course, trainings, project, initiatives etc.)	Project
Sector (like medicine, architecture, IT)	IT
Area of technologies (like AI, AR, VR, IoT)	Programming, electronics, digital arts and responsible use of technology
Target group	All genders, primary and secondary school
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	As part of the project Code Week, the Digital Innovation Hub of Slovenia (DIHS), together with the national FabLab Slovenia network and the support of Google, ran national free coding activities for young people. Aim of this initiative is to offer primary and secondary school girls and boys the opportunity to develop their digital skills and acquire new knowledge in the IT area. In addition to the basics of coding, young people and their parents also had the chance to make games, artistic animations or take part in workshops on online violence and responsible use of technology.
Main focus: topics or modules	They offered a wide range of workshops for all interested young people such as Lego robots, Chat apps, HTML and CSS programming, Java, Raspberry Programming.

	Furthermore, they also organized a sports and digital activities such as the Coding Treasure Hunt, where young people used their smartphones to search for "treasure" outside the classroom.
Learning outcomes	They acquired code skills, developed ICT and creativity skills and also raised digital literacy.
Methodology (if applicable)	Coaching, non formal education
Organizing institution	Digital Innovation Hub Slovenia
Language'(s)	Slovenian
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	Year 2019
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **RampaLab**

Case study No. 4	https://kersnikova.org/about-us/rampa
Title of the programme or course	**RampaLab**
Type of the case (course, trainings, project, initiatives etc.)	Project platform
Sector (like medicine, architecture, IT)	Science and technology
Area of technologies (like AI, AR, VR, IoT)	Biotechnology, biology, digital media, wearable technology, sound, environment, robotics, energy, alternative energy, etc.
Target group	Young people from 15 to 29 years old
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Rampa is a platform for the incubation and production of artistic projects by young creators, and hosts a number of activities by different communities that support and promote gender equality. They engage young people in collaborative work with artists,

	scientists and other professionals using methods of organized informal exploratory learning. The aim of the project is to encourage young people between 15 and 29 years of age to develop their creativity and their first artistic or research projects together and under the mentorship of world-renowned artists and scientists, and to train them as future mentors for their workshops. Above all Rampa develops programs that encourage young people's exploration at the intersection of art, science and technology.
Main focus: topics or modules	Through exploratory learning, which is integrated into weekly workshops called the Friday Academy (5HEK), children and young people are introduced to do-it-yourself and do-it-together methods, hands-on approaches and transdisciplinary work, open source hardware and software, free exchange of knowledge, ideas and skills, etc. They also organize workshops where they talk about current challenges in technology and also about the conditions under which girls and women can work in technology and science. They also provide participants laser cutter to teach them digital design and the production of unique products.
Learning outcomes	Understanding of the technology world, digital skills, software and hardware skills, creativity skills.
Methodology (if applicable)	Coaching and mentoring, non formal education
Organizing institution	Institute Kersnikova
Language'(s)	Slovenian
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	In progress
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **RampaLab**

Case study No. 5	https://cipkeen.wordpress.com/initiative
Title of the programme or course	**ČIPke**
Type of the case (course, trainings, project, initiatives etc.)	Initiative
Sector (like medicine, architecture, IT)	Technology, IT, Science, Art
Area of technologies (like AI, AR, VR, IoT)	AI, Sensorics, Coding
Target group	Adult woman
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	ČIPke is an initiative for researching the conditions for women who are active in the context of science, technology and media art. The goal is to open a space for conversation about women working in these fields and to organize practical educational programmes including various workshops on electronics, robotics, open source programing, and the usage of open source programs for graphical design, video editing, sound synthesis. ČIPke Open Lab is dedicated to co-learning and upgrading of skills and know-how acquired at a previous workshop; or to development of independent projects.
Main focus: topics or modules	They organize different types of workshops for example: coding, programming, electric sensors, wearable technology, biotechnology, cryptographics/algorithms/protocols, hybrid live performative formats, sensorics, AI, modular synthesis, analog electronic instruments, lasers etc.
Learning outcomes	All workshops are based to include their participants in the creation of outcomes and they provide interactive methods for each workshop. By the end participants understand complex processes which modern technology provides.
Methodology (if applicable)	Coaching and mentoring, non formal education
Organizing institution	ČIPke Community
Language'(s)	Slovenian
Duration (if applicable) *If the project is ended, the*	In progress

recommendation no later than 5 years, but you can provide older projects	
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **Digital summer school for girls and boys**

Case study No. 6	https://vsak.si/spored/digitalna-ustvarjalnica-2021-07-05
Title of the programme or course	**Digital summer school for girls and boys**
Typeof the case (course, trainings, project, initiatives etc.)	Training (workshops)
Sector (like medicine, architecture, IT)	IT, digital literacy
Area of technologies (like AI, AR, VR, IoT)	Coding, technology engineering
Target group	Young boys and girls
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Vsak Institute organized one-week digital summer school starting in July 2021. They learned basics of coding while creating different products and artworks, they also had to present this in front of their classmates e.g. an algorithm dance, an interactive art installation, a moving poem, a redesigned website, or a games crated on mini-computers. They also provide them with lunch, and exercise and promote how important is to keep a mind and body in good shape. Above all the participation was free for all the children. In the Institute Vsak they promote the creative and responsible use of technology, especially by bringing digital education to young people. They also empower young people with computational thinking and understanding the impact of technology on the individual and the community.
Main focus: topics or modules	There were 5 modules which addressed different topics – Algorithms/programming without a computer, Media/Internet, Socially responsible programming and transport, Web programming as poetry, A mini-computer for maxi-fun (case - Micro:bit).
Learning outcomes	Coding, writing, public speaking, creativity and engineering skills

Methodology (if applicable)	Coaching, non formal education
Organizing institution	Institute Vsak
Language'(s)	Slovenian
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	July 2021
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **Robotics**

Case study No. 7	http://stiri.si
Title of the programme or course	**Robotics**
Type of the case (course, trainings, project, initiatives etc.)	Courses
Sector (like medicine, architecture, IT)	IT
Area of technologies (like AI, AR, VR, IoT)	Robotics
Target group	Young boys and girls (6-11 years old)
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Institute 4.0 provides knowledge on robotics (Lego robotics, Lego mind-storms and Lego-wedo), their goal is to educate youth and adults with knowledge of the future which must be thought of in a purely practical and experiential way (through play and exploration). They highlight that Lego robotics is one the world's leading tools for teaching science, technology, engineering and mathematics on the one hand, and programming on the other.
Main focus: topics or modules	Courses are divided in age groups 6-7 years old, 8-9 years old and 10-11 years old and in different groups they have different difficulty level – Beginner robotics & Lego mechanics, intermediate Lego robotics and Advanced Lego robotics. Monthly

	program of courses has 8 hours of practical learning of programming and robotics and 2 hours of theory about modern technology topics.
Learning outcomes	Robotics and programming skills
Methodology (if applicable)	Coaching, non formal education
Organizing institution	Insitute 4.0
Language'(s)	Slovenian
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	In progress
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Portugal

Partner Name and Country: **Instituto Politécnico de Tomar, Portugal**

Name of Case Study: **Plug-in Mentoring for Girls**

Case study No 1	www.farfetchtechblog.com/en/blog/post/plug-in-mentoring-for-girls
Title of course, trainings, project, initiatives etc.	**Plug-in Mentoring for Girls**
Case Type (course, trainings, project, initiatives etc.)	Private initiative
Sector (such as medicine, architecture, IT)	Luxury fashion industry
Area of technologies (such as AI, AR, VR, IoT etc.)	Data, Security, Product, Mobile.
Target group	High school senior girls
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Plug-In Mentoring for Girls is a mentoring programme from Farfetch company offering to mentor students preparing them to enter higher education courses in Technology, Engineering or Mathematics. This initiative started in 2020 with ten students and ten mentors in Portugal. In 2021, the programme has been gaining a new dimension and will also have mentors in Brazil, China and the United Kingdom. The programme allows supporting young women, giving them the opportunity to be closer to practical reality and contribute with the knowledge that they will later be able to apply in their professional life. The girls selected during the first year of the course will be followed up by the company through formal quarterly sessions with the mentors, coaching and permanent and informal access, which is meant to make a difference in an initial and determining phase of each one's path, with a mentorship tailored to their academic and professional ambitions. The mentors are experienced project leaders in different areas such as Data, Security, Product or Mobile.
Main focus: topics or modules	Tailored mentorship

Learning outcomes	To create knowledge that they will later be able to apply in their professional life. Inspire and give the opportunity to experience corporate reality.
Methodology (if applicable)	Coaching and Mentoring
Organizing institution	Farfetch
Language(s)	Portuguese and local language
Duration (if applicable) *Older projects can be supplied, but if completed they should not be more than 5 years old.*	1 year
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	3

Name of Case Study: **GEN10S Portugal**

Case study No 2	https://genios.org.pt
Title of course, trainings, project, initiatives etc.	**GEN10S Portugal**
Case Type (course, trainings, project, initiatives etc.)	Project initiative
Sector (such as medicine, architecture, IT)	IT
Area of technologies (such as AI, AR, VR, IoT etc.)	Programming
Target group	5th and 6th grade students
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Gen10s a project that aims to teach programming to children, promoting equal opportunities in the digital area, reducing socioeconomic and gender barriers. Given the good results obtained in Spain, Google.org challenged SIC Esperança to implement the project in Portugal, in order to ensure our children have access to the

	same opportunities, ensuring that all achievements are based on effort and merit, and never constrained by gender or the socioeconomic situation of their household. With this project we intend to train 5th and 6th grade students from all over the country in Scratch programming, 5,000, contributing to a new perception of technology in children, demonstrating that they can not only consume it, but also create it through this software. The project also envisages the training of 500 teachers, providing them with the necessary tools for the adoption of innovative ways of teaching.
Main focus: topics or modules	Programming in Scratch
Learning outcomes	Train 500 teachers Teach programming to 5000 children
Methodology (if applicable)	
Organizing institution	GEN10S Portugal
Language(s)	Portuguese
Duration (if applicable) *Older projects can be supplied, but if completed they should not be more than 5 years old.*	4 years
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **Portuguese Women in Tech**

Case study No 3	www.portuguesewomenintech.com
Title of course, trainings, project, initiatives etc.	**Portuguese Women in Tech**
Case Type (course, trainings, project, initiatives etc.)	Private initiative
Sector (such as medicine, architecture, IT)	Cross-cutting to various sectors

Area of technologies (such as AI, AR, VR, IoT etc.)	Various on STEM
Target group	Girls and Women
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Activities: -To showcase women in the Portuguese Startup Scene. Spread the word about the stories of the women that were building the Portuguese Tech Scene. -To organise events and workshops. From workshops on productivity and the Web Summit to bigger events such as the Portuguese Women in Tech Awards and the PWIT Hackathon. -Distribution of the first booklet with the help of ScaleUp Porto that was distributed to girls in the schools of the Porto region. And we launched a second edition with the support of EDP. -Mentorship program, a bookclub and a female founders entrepreneurship program. -Provision tools: Portuguese Women in Tech Speakers List, the Salary Transparency Project and the Pioneers Report.
Main focus: topics or modules	To support women in technology by providing visibility, networking, mentorship and by creating training actions and other opportunities.
Learning outcomes	To attract more women and girls to tech and in this way, increase the pipeline
Methodology (if applicable)	Providing tools; Mentoring programs; organizing events
Organizing institution	Portuguese women in tech
Language(s)	Portuguese and english
Duration (if applicable) *Older projects can be supplied, but if completed they should not be more than 5 years old.*	Not applicable
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	4

Name of Case Study: **Code Week**

Case study No 4	https://codeweek.eu
Title of course, trainings, project, initiatives etc.	**Code Week**
Case Type (course, trainings, project, initiatives etc.)	Initiative
Sector (such as medicine, architecture, IT)	IT
Area of technologies (such as AI, AR, VR, IoT etc.)	Programming
Target group	Students (Young people) from all over the world
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	EU Code Week was launched in 2013 by the Young Advisors for the Digital Agenda Europe. The European Commission supports EU Code Week as part of its strategy for a Digital Single Market. In the Digital Education Action Plan the Commission especially encourages schools to join the initiative. EU Code Week is a grass-roots movement that celebrates creativity, problem-solving and collaboration through programming and other tech activities. The idea is to make programming more visible, to show young, adults and elderly how you bring ideas to life with code, to demystify these skills and bring motivated people together to learn. In 2019, 4,2 million people in more than 80 countries around the world took part in EU Code Week. The average participant was 11 years old and 49% of participants in 2019 were women or girls. 92% of EU Code Week events took place in schools, which show that efforts to empower teachers during the 2019 campaign have been successful.
Main focus: topics or modules	Solve problems using codes.
Learning outcomes	The goal is to help more young people to master the basics of coding and computational thinking
Methodology (if applicable)	Not applicable
Organizing institution	European Commission

Language(s)	Several
Duration (if applicable) *Older projects can be supplied, but if completed they should not be more than 5 years old.*	One week, every year
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **Girls in Tech**

Case study No 5	https://girlsintech.pt
Title of course, trainings, project, initiatives etc.	**Girls in Tech**
Case Type (course, trainings, project, initiatives etc.)	Initiatives
Sector (such as medicine, architecture, IT)	Education
Area of technologies (such as AI, AR, VR, IoT etc.)	STEM studies
Target group	Female Students: High School and Higher education students
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Girls in Tech is an initiative launched by the Spark Association for Education. The mission is to contribute to greater gender diversity in STEM courses, through a set of activities that promote interaction between high school and higher education students. Arouse interest and curiosity of secondary school students about the STEM areas; Fight stereotypes, demystify beliefs and prejudices related to the presence of women in technological areas; Create a network for sharing experiences and knowledge among women linked to Technology;

	Disseminate success stories of higher education students in STEM courses, which can serve as models and inspiration for secondary school students; Facilitate the creation of future employment opportunities.
Main focus: topics or modules	Not applicable
Learning outcomes	Create future employment opportunities for girls
Methodology (if applicable)	School presentations
Organizing institution	Spark association for Education
Language(s)	Portuguese
Duration (if applicable) *Older projects can be supplied, but if completed they should not be more than 5 years old.*	Not applicable
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	3

Name of Case Study: **Programming and Robotics Clubs**

Case study No 6	www.erte.dge.mec.pt/clubes-de-programacao-e-robotica
Title of course, trainings, project, initiatives etc.	**Programming and Robotics Clubs**
Case Type (course, trainings, project, initiatives etc.)	Project
Sector (such as medicine, architecture, IT)	IT
Area of technologies (such as AI, AR, VR, IoT etc.)	Robotics
Target group	Elementary and High School Students
Brief description (provide short description in EN, 150-200 words).	The National Network of Programming and Robotics Clubs (CPR), created in the 2014/2015 school year, has a significant impact in Portuguese schools, with 398 Clubs having been created last year

For example, aim, goals, what is about, formal or non-formal education etc.	Interdisciplinarity, collaborative work, project based methodology, the application of knowledge in new situations that approach real problems, allow students to acquire multiple literacies, necessary for the challenges posed to education in the context of today's high society for the future of the people and the country. The Ministry of Education annually promotes the Programming and Robotics Clubs Contest that stimulate a wide range of transversal skills, which are fundamental to the development of the areas of Science, Technology, Engineering, Arts and Mathematics (STEAM). Clubs take part in the contest with work carried out by the students.
Main focus: topics or modules	Development of projects using programming and robotics kits
Learning outcomes	Interdisciplinarity, collaborative work, project based methodology, Application of knowledge to new situations and to solve real problems
Methodology (if applicable)	Project based learning
Organizing institution	Portuguese Ministry of Education
Language(s)	Portuguese
Duration (if applicable) *Older projects can be supplied, but if completed they should not be more than 5 years old.*	Annual contest
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	3

Name of Case Study*:* **Geek Girls Portugal**

Case study No 7	http://geekgirlsportugal.pt
Title of course, trainings, project, initiatives etc.	**Geek Girls Portugal**
Case Type (course, trainings, project, initiatives etc.)	Initiative
Sector (such as medicine, architecture, IT)	Nonprofit association
Area of technologies (such as AI, AR, VR, IoT etc.)	Several STEAM areas
Target group	Women and girls
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Non-profit Community with more than 500 women who organise initiatives across different cities in Portugal, namely, Aveiro, Braga, Coimbra, Faro, Leiria, Lisbon and Porto. Activities: - Meetings - Sharing experience moments, for networking and projects arrangements; - Workshops - About a specific STEM theme; -Actions in Schools – Awareness-raising sessions for students and teachers; The lectures cover a wide range of topics from more technical areas – electronics, software, hardware – to project management methodologies, innovation management, digital media or even motivational topics. - Mentoring.
Main focus: topics or modules	Not Applicable
Learning outcomes	To create a vast network of women interested in technology and giving them the conditions to establish contacts with other women and companies to bring them professional added value.
Methodology (if applicable)	Not applicable
Organizing institution	Geek Girls Portugal
Language(s)	Portuguese

Duration (if applicable) *Older projects can be supplied, but if completed they should not be more than 5 years old.*	Not Applicable
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	3

Name of Case Study*:* **Digi Girlz (Microsoft)**

Case study No 8	https://digigirlzevents.microsoftcrmportals.com/landingpage
Title of course, trainings, project, initiatives etc.	**Digi Girlz (Microsoft)**
Case Type (course, trainings, project, initiatives etc.)	Project
Sector (such as medicine, architecture, IT)	IT
Area of technologies (such as AI, AR, VR, IoT etc.)	Robotics; programming, artificial Intelligence, gaming
Target group	Girls (11-17)
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Microsoft DigiGirlz programs give Middle School/Junior School (Ages 11-13) and High School/Secondary School (Ages 14-17) girls, opportunities to learn about careers in technology, connect with Microsoft employees and participate in hands-on computer and technology workshops. Current offerings are virtual experiences to connect girls with opportunities to learn and connect around technology, workshops and amazing role models in a variety of technical and tech infused careers.
Main focus: topics or modules	Workshops, tech demonstrations, talks,
Learning outcomes	For girls to discover how skills can help make dreams come true.
Methodology (if applicable)	Active methodologies
Organizing institution	Microsoft

Language(s)	Portuguese and a multi-language
Duration (if applicable) *Older projects can be supplied, but if completed they should not be more than 5 years old.*	Periodically in several countries, with varying duration, depending on the open program.
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study*:* **PrograMaria**

Case study No 9	www.programaria.org
Title of course, trainings, project, initiatives etc.	**PrograMaria**
Case Type (course, trainings, project, initiatives etc.)	Project and training courses
Sector (such as medicine, architecture, IT)	IT
Area of technologies (such as AI, AR, VR, IoT etc.)	Programming
Target group	Girls (11-17)
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Contribute to making more girls and women motivated and confident to explore the fields of technology, programming and entrepreneurship; Encourage debate about the lack of women in these fields; Actions: interviews, reports, tutorials, infographics and other content that inspire everyone to reverse this negative picture. Meetings, workshops and other events for people with the same interest to meet, exchange experiences and create!
Main focus: topics or modules	Programming Online courses; Summit events

Learning outcomes	Promote opportunities and tools for girls to take the first steps in learning programming. Online courses.
Methodology (if applicable)	E-learning
Organizing institution	PrograMaria
Language(s)	Portuguese
Duration (if applicable) *Older projects can be supplied, but if completed they should not be more than 5 years old.*	Not applicable
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	4

Name of Case Study: **10 Girl in ICT Week**

Case study No 10	www.portugal.gov.pt/pt/gc22/comunicacao/comunicado?i=dia-internacional-das-raparigas-nas-tic
Title of course, trainings, project, initiatives etc.	**Girl in ICT Week**
Case Type (course, trainings, project, initiatives etc.)	Project
Sector (such as medicine, architecture, IT)	Education
Area of technologies (such as AI, AR, VR, IoT etc.)	Robotics; programming, artificial Intelligence, gaming
Target group	Students (11-17)
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	Girl in ICT Week is part of the Portuguese Government's objective of reversing the trend towards a reduction in the participation of girls and women in ICT and engineering. Through the area of citizenship and equality, the Government has sought to place this issue on the political and media agenda.

	In 2017, it led to the creation of the "Engineers for a Day Project", which has already reached almost 10,000 young students from Portuguese elementary and secondary schools, in 460 activities, including laboratory practices, role model sessions and mentoring. An initiative of the SECI, it is coordinated in conjunction with the Portuguese Charter for Diversity (APPDI), the Instituto Superior Técnico and the Ordem dos Engenheiros, currently involving a network of 58 partner entities where technological companies such as the IBM, DefinedCrowd, Microsoft, Sensei and Siemens, 26 elementary and secondary schools and 13 higher education institutions. The project is now part of the Action Plan for the Digital Transition together with the InCoDe.2030 Program.
Main focus: topics or modules	Laboratory practices, role model and mentoring
Learning outcomes	Awaken interest and creativity in the areas of engineering and technology
Methodology (if applicable)	Active methodologies; Laboratory sessions
Organizing institution	Portuguese Ministry of Education
Language(s)	Portuguese
Duration (if applicable) *Older projects can be supplied, but if completed they should not be more than 5 years old.*	1 week, annually
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **EX.I.T.E CAMP (IBM)**

Case study No 11	www.ualg.pt/exite-camp https://tek.sapo.pt/noticias/computadores/artigos/ibm-estende-a-portugal-programa-de-formacao-para-jovens https://channeldailynews.com/news/ibms-exite-technology-camp-for-girls-is-open/27572
Title of course, trainings, project, initiatives etc.	**EX.I.T.E CAMP (IBM)**
Case Type (course, trainings, project, initiatives etc.)	Project
Sector (such as medicine, architecture, IT)	IT
Area of technologies (such as AI, AR, VR, IoT etc.)	Robotics; programming, artificial Intelligence, gaming
Target group	Girls (11-13)
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	EX.I.T.E. (Exploring Interests in Technology and Engineering) Technology Camp has been inspiring young girls to take an interest in maths, science, technology and engineering by participating in a dynamic and interactive program run entirely by IBM volunteers. Girls aged 11-13 participate in 5 days of learning and discovery at IBM's EX.I.T.E. Camp. Campers are provided with activities such as building and programming Lego Mindstorm robots for a Secret Covert Mission; extracting DNA from bananas; designing shoes based on a suspect's footprint, building computer programs; learning about online safety, and more… Designed to inspire young girls to take interest in technology and explore the endless career possibilities within technical fields, this camp is sure to inspire future innovators to help retain a competitive position in the global digital economy.
Main focus: topics or modules	Laboratory practices, role model and mentoring

Learning outcomes	Arouse interest and creativity in the areas of engineering and technology; Give the girls an overview of the engineering process and background on the biomechanics and robotics.
Methodology (if applicable)	Active methodologies; Laboratory sessions
Organizing institution	IBM
Language(s)	Several (taking place in 47 cities in different countries)
Duration (if applicable) *Older projects can be supplied, but if completed they should not be more than 5 years old.*	5 days, annually
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Greece

Partner Name and Country: **Hellenic Open University, Greece**
Name of Case Study: **Exploiting Ubiquitous Computing, Mobile Computing and the Internet of Things to promote Science Education,**

Case study No 1	http://umi-sci-ed.eu
Title of course, trainings, project, initiatives etc.	**UMI-Sci-Ed (H2020 / SEAC)**
Type of the case (course, trainings, project, initiatives etc.)	Project
Sector (like medicine, architecture, IT)	IT, Education
Area of technologies (like AI, AR, VR, IoT etc.)	Ubiquitous, Mobile and IoT (UMI) technologies
Target group	14-16 aged boys and girls
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	UMI-Sci-Ed aims to empower young people to think creatively, apply new knowledge in an effective way and become continuously competitive in a highly demanding working environment. It is targeted to 14-16 aged youngsters in European countries and puts emphasis on the creation of knowledge-based societies and social networks by the introduction and actual use of state-of-the-art technologies. The orientation of UMI-Sci–Ed is entrepreneurial and multidisciplinary to raise young boys' and girls' motivation in science education and to increase their prospects in choosing a career in UMI. The broad aim of the project is to investigate the introduction of UMI technologies in education. Especially, the project aims to offer novel educational services, implement innovative pedagogies and enhance students' and teachers' creativity, socialisation and scientific citizenship. The project's core objectives are the following: O1 Novel educational services; O2 Career consultancy services; O3 Supporting software tools; O4 Supporting hardware tools; O5 Dissemination of the project ideas and results.

Main focus: topics or modules	The main focus is on developing a training mechanism, as a methodology, for young students, containing guidelines for UMI learning under the CoPs format, roles and structures. This study takes under consideration evaluation results to reveal drawbacks on using UMI technologies and CoPs schema in upper high school settings and structures for effectively using UMI tools and applications in a situated learning environment.
Learning outcomes	- A methodology for establishing CoPs for UMI and STEM in learning environments for 14-16 year olds youngsters as well as educational material -A low cost modular hardware kit - the supporting programming environment has been integrated with the kit. -Open source UMI-Sci-Ed platform that provides all the basic functionalities and services allowing the use of it for educational purposes and supporting the CoPs approach. -UMI-Lab, an umbrella organization, that will support the CoPs has been established. -Local Pilots
Methodology (if applicable)	A methodology for establishing CoPs for UMI and STEM in learning environments for 14-16 year old youngsters has been designed, as well as educational material (UMI platform)
Organizing institution	CTI (Computer Technology Institute and Press “Diophantus”)
Language(s)	English, Greek, Itallian, Norwagian, Finish
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	01.06.2016 – 31.05.2019
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **CrowdDreaming: youths co-create Digital Culture**

Case study No 2	www.crowddreaming.eu
Title of course, trainings, project, initiatives etc.	**CDDC**
Type of the case (course, trainings, project, initiatives etc.)	Project
Sector (like medicine, architecture, IT)	IT, Education
Area of technologies (like AI, AR, VR, IoT etc.)	Content based learning, AR, VR
Target group	13-19 aged boys and girls
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	CDDC project aims to disseminate and scale-up at European level a good practice in the field of the valorization of digital cultural heritage as a means for inclusive education and for the promotion of European values among youngsters. The project scales up a best practice of the same name developed by Stati Generali dell'Innovazione (General States of Innovation, SGI). "Crowddreaming" was born as a contest for Italian schools, promoted by Stati Generali dell'Innovazione and the Digital Cultural Heritage, Arts and Humanities School. Its third edition took place in 2018. It aims to encourage the awareness to both teachers and young people about the epochal challenge upon which new generations are called, they will be the first in history to find themselves passing down a purely digital cultural heritage. The competition aims to raise awareness of the difficulties of this challenge and to stimulate the adoption of the new paradigms of thought required to operate in the digital dimension. Crowddreaming involves 5 partners coming from 5 European countries. The pilot action will be implemented in 4 Countries (Latvia, Croatia, Greece and Italy) and will directly address secondary school teachers (20 in each country) and students (400 in each country)

Main focus: topics or modules	Based on a principle of content-based learning, each edition invites the participants to contribute to the construction of a digital monument, placing them on the challenge of generational transmission of digital cultural contents. The project develops a curriculum which will be piloted in Italy, Croatia, Latvia, and Greece. Trainers will be trained in the curriculum and will support teachers who will learn the course contents through MOOCs. At the end of the project a digital monument (Europea square) will be developed. The project aims to reach 400 secondary school students per piloting country, creating 20 digital scenes per country. The project platform, Europa square will host at least 80 digital scenes from the students across Europe.
Learning outcomes	Training Toolkit Curriculum for Teachers CDDC Massive Open Online Course Selected teachers take part at the following activities: -co-design of a training path on Digital Cultural Heritage, taking part at two coaching circles in May 2019 and informing us on the most relevant skills they need to develop in order to involve their students in project based activities aimed at developing digital projects for the valorisation of their local heritage; - blended training course to learn how to implement the Crowddreaming methodology, consisting of: - 35 hours interactive MOOC, carried out between January and March 2020, where you will have the chance to meet with other national and international colleagues, learning how to digitally enhance the value of local, regional and national cultural heritage as a mean to promote the European identity, common values, cultural dialogue and understanding. -Face-to-face workshop with students mentored by expert Crowddreamers, to be implemented between April and June 2020, for the collaborative production of digital projects on the valorisation of local cultural heritage.

	-"Europa Square" as a digital monument to European transculturalism is an ecosystem composed by three main tightly interacting components: (1) The Museater, where values relevant to the community are preserved in time and staged as interactive digital stories, and augmented and virtual reality experiences; (2) The Community, that keeps the digital monument alive and meaningful and, (3) Online platform (VR version) where Community members meet, plan, work and deliver together. Policy recommendations based on the results of training and piloting activities, for further transferability and upscaling of the project results.
Methodology (if applicable)	Training Needs Analysis Report and Transfer Framework introducing Crowddreaming method, presenting the analysis of the training needs of the participating schools from participating countries and outlining operational framework to transfer the good practice.
Organizing institution	ALL DIGITAL (Co-ordinator)
Language(s)	English, Croatian, Greek, Italian and Latvian
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	15/01/2019 – 14/04/2021
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **Videogames 4 Teachers**

Case study No 3	https://v4t.pixel-online.org
Title of course, trainings, project, initiatives etc.	**V4T**
Type of the case (course, trainings, project, initiatives etc.)	Project

Sector (like medicine, architecture, IT)	IT, Education
Area of technologies (like AI, AR, VR, IoT etc.)	Educational Videogames and mobile apps
Target group	Higher education lecturers in Faculties of Education Future teachers
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	The V4T project aims to promote innovation of didactic methods through the use of videogames and ludic apps and to provide future teachers with the necessary skills and competences to make effective use of videogames and ludic apps in education. The objectives of the V4T project are: Investigate the state of art as far as educational video games are concerned, analyzing their characteristics and technical solutions, as well as their didactic potential. Explore in depth the methodological, pedagogical and also skills and competences assessment aspect of the use of video games and apps for educational purposes. Provide future teachers with a comprehensive reflection on the innovation of didactic methods through the use of video games and apps for mobiles, and on the issues related to the assessment of competences, skills and knowledge according to the principles of the ECVET and ECTS systems, applying them to educational Video Games. Provide future teachers with the basic knowledge of programming languages and authoring tools in order to make them autonomous in developing educational video games and apps for mobile.
Main focus: topics or modules	The contents of the e-learning based training package, structured in 3 modules, make full use of ICT and Media, providing teachers with e-texts explaining the main aspects of the different subjects and references to existing manuals, demos, guidelines and wizards that are available on-line. Each module provides also practical activities, exemplary case studies and/or learning objects to put into practices the theoretical concepts and interactive test to allow teachers to self-assess the knowledge acquired Module 1 - Planning educational Videogames and APPs

	Module 2 - Programming and authoring tools for developing educational videogames Module 2 - Programming and authoring tools for developing educational APPs
Learning outcomes	The outcomes of V4T project are: -Repository of videogames and mobile apps designed either for educational purpose or have a clear and strong educational potential -Guide for future teachers on how to use videogames and apps for educational purpose -Online training package to introduce future teachers to the main programming languages used to develop videogames, web games and apps
Methodology (if applicable)	-
Organizing institution	PIXEL – Associazione Culturale (Coordinator)
Language(s)	English, Spanish, Greek, Austian, Italian, Lithuanian
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	1/11/2017 – 31/10/2019
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **Boosting Global Citizenship Education using digital storytelling**

Case study No 4	http://www.brights-project.eu
Title of course, trainings, project, initiatives etc.	**BRIGHTs**
Type of the case (course, trainings, project, initiatives etc.)	Project
Sector (like medicine, architecture, IT)	IT, Education
Area of technologies (like AI, AR, VR, IoT etc.)	Online Tools
Target group	- Secondary school teachers and trainers (e-facilitators, youth workers, cultural mediators etc.) working in formal and non-formal educational settings (schools, Telecentres, Youth Centres, NGOs etc.) with young people. - Young people (13-19 years old), including youngsters at risk of marginalisation - Education and training policy-makers and stakeholders
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	BRIGHTS promotes Global Citizenship Education (GCE) in formal and non-formal Education with the help of digital storytelling (DS) techniques, leading to more socially inclusive education and training policies and practices in Europe. It will increase awareness and knowledge on GCE among educators, trainers, policy makers and the civil society, and will give young people real opportunities to challenge discriminations, value cultural diversity and become active citizens. This will led to the establishment of the first European Community on GCE. This group is open and free and will use the existing Unite-IT platform to foster cooperation and synergies among project participants, existing members of the community and new interested actors. BRIGHTS will disseminate and upscale two existing best practices, which fall into the scope of the Paris Declaration: (a) the RIGHTS "Promoting Global Citizenship Education through Digital Storytelling" online course; and (b) the UNITE-IT "Uniting Europe through digital empowerment" online platform.

	The project will realize a training curriculum and a blended course. At least 400 teachers and trainers will be trained through a MOOC on how to implement Global Citizenship Education using digital storytelling. A subset of them (100) BRIGHTS' objectives are: To build teachers' and trainers' capacity to implement GCE with young people using digital storytelling techniques, and to empower young people to develop social, civic and intercultural competences as well as critical thinking, media literacy, creativity and digital skills. In practice, young people will produce digital stories on Global Citizenship topics
Main focus: topics or modules	The project realizes a training curriculum and a blended course. At least 400 teachers and trainers will be trained through a MOOC on how to implement Global Citizenship Education using digital storytelling. A subset of them (100) will attend face-to-face workshops and then directly apply the acquired methodology with young people at risk of marginalisation in disadvantaged areas and institutions of the project countries. Around 1500 young people (13-19 years old) will be directly involved in the project and engaged in the production of digital stories on global challenges and subjects including human rights, peace and democratic values, intercultural dialogue, active citizenship etc.
Learning outcomes	BRIGHTS' Outcomes are: Collection of good practices for promotion and learning of GCE Blended training course for educators (including a MOOC and face-to-face workshops) on how to implement GCE using digital storytelling Digital stories produced by young people on GCE topics, such as human rights, peace and democratic values, intercultural dialogue, active citizenship, etc. European Community on GCE on the Unite-IT platform Information kit on GCE for policy-makers Policy recommendations on GCE, based on the project experimentation inBelgium, Croatia, Greece and Italy
Methodology (if applicable)	--

Organizing institution	ALL DIGITAL (formerly Telecentre-Europe) (Coordinator)
Language(s)	Eglish, Frenc, Duch, Croatian, Greek, Italian
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	31/12/2016 – 31/12/2018
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **Competence development of STE(A)M educators through online tools and communities**

Case study No 5	https://steamonedu.eu
Title of course, trainings, project, initiatives etc.	
Type of the case (course, trainings, project, initiatives etc.)	Project
Sector (like medicine, architecture, IT)	IT, Education
Area of technologies (like AI, AR, VR, IoT etc.)	Online Tools and communities
Target group	STE(A)M educators
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	The STEAMonEDU project (Competence development of STE(A)M educators through online tools and communities) aims to contribute to innovative and cross-disciplinary approaches in implementing STE(A)M education by revising and strengthening the professional profile of the teaching profession. The specific project objectives are: to attribute to the community of STE(A)M education stakeholders (teachers, educators, researchers, policy-makers, education authorities, career consultants,

	content producers etc.) a central role in designing, implementing and assessing STE(A)M education policies to develop online tools in order to support this community; these will be accessible via an online platform that will support peer learning, collaboration, crowdsourcing, indexing and access to resources, learning activity templates, project implementation, policy design, etc. to collect and assess practices based on local and regional initiatives that support STEM and STE(A)M education, to collect, analyse and index (using an IEEE LOM compatible meta-data scheme) evidence to substantiate innovative policies and practices, to design a core STE(A)M education framework containing a STE(A)M instructional meta-methodology, the STE(A)M body of knowledge, a special focus on diversity issues (including gender and social inclusion issues), STE(A)M learning activity and course templates, to develop and test STE(A)MComp, the competence framework for STE(A)M, along the example of DigComp for Edu, to design the STE(A)M educator profile in an ESCO compatible manner, to design a STE(A)M evaluation readiness test for Schools following the example of SELFIE, to test STE(A)MComp by delivering an online course for the professional development of STE(A)M educators, including a cMOOC that implements the principles of Open Education, uses OERs and adheres to the MOOQ Quality Reference Framework, to produce the STE(A)M Policy Influencer Toolkit containing recommendations for the uptake of STE(A)M education in Europe.
Main focus: topics or modules	The training will be implemented as a blended course that will include a MOOC. The tools will include an instructional meta-methodology, STE(A)M body of knowledge, online activity templates, STE(A)M education good practices and a STE(A)M readiness self-assessment tool. A crowdsourcing bottom-up approach will be put in place for the

	stakeholders of STE(A)M education (including teachers, researchers, policy makers etc.), resulting in peer learning and support in the design and implementation of STE(A)M education policies and in the development of open content.
Learning outcomes	The project will: Develop a new approach to adult education and training which focuses on learning outcomes and learner responsibility and autonomy; -Foster greater awareness among adults that learning is a lifelong endeavour which they should pursue at regular intervals during their lives, and particularly during periods of unemployment or career transition; -Encourage the development of effective lifelong guidance systems, as well as integrated systems for the validation of non-formal and informal learning; - Ensure the comprehensive provision of high-quality formal and non-formal education and training for teachers aimed at acquiring STE(A)M Digital competences; -Ensure flexible arrangements adapted to different training needs of teachers; - Promote the role of social partners and civil society in articulating training needs and developing learning opportunities for teachers, as well as optimise the involvement of central, regional and local authorities in order to reach broader audiences and ensure long-term financial sustainability The results include: - Training plan / handbook - Guide on STE(A)M Education Policies and Educators' Needs - Guide of STE(A)M Education Practices - STE(A)M educational objects meta-data profile - STE(A)M educator competence framework and profile - STE(A)M education framework
Methodology (if applicable)	At methodological level, the project will put the basis for the future elaboration of derivate frameworks, inspired by the already existing ones, such as DigCompConsumers and DigCompTeach, or focused on completing new sectors and

	target groups, first by identifying the necessary STE(A)M competences and the skills required for STE(A)M teaching and then providing targeted teacher training together with a set of assorted tools. In the long-term, the project's systemic approach for the assessment, monitoring and improvement of teacher STE(A)M skills will raise important benefits in many policy areas and it will represent a precious toolkit for implementing effective outreach strategies to difficult-to-engage groups of adults.
Organizing institution	CTI – DAISSy
Language(s)	English, German, Duch,Italian, Greek, Spanish, Romanian
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	01/01/2020 – 31/12/2021
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	4

Name of Case Study: **Training the Educators to facilitate the Teaching and Assessment of Abstract Syllabus by the use of Serious Games-CrAL**

Case study No 6	www.cral-lab.eu
Title of course, trainings, project, initiatives etc.	
Type of the case (course, trainings, project, initiatives etc.)	Project
Sector (like medicine, architecture, IT)	IT, Education
Area of technologies (like AI, AR, VR, IoT etc.)	Online tools, multimedia
	Young people 14-19 years old

	Educational Staff (Secondary school teachers and trainers working in non-formal environments) Parents and members of the community
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	CrAL addresses young people (aged 14-19) so they can reinterpret and lead the production of audiovisual contents. Secondary school teachers and trainers working in non-formal environments will be taught how to educate their students in the creative audiovisual reading, writing and production for the enhancement of their media literacy skills and critical thinking. Their parents and members of their community will also be involved in the project as active protagonists in order to maximize CrAL's impact on a local, national and European level. The aim of the project is to enhance critical thinking and media literacy among young people between 14-19 years old, parents, and educational staff. This will contribute to provide young people with the tools they need to understand the world they live in, stimulate their critical thinking and sense of responsibility, and help them realise the power of their voice. The project will facilitate the acquisition of digital skills among students such as active communication, collaboration, creativity, problem solving, critical thinking and self-confidence. It will also promote social inclusion of disadvantaged target groups. Young people will become active creators of solutions for social challenges, while disadvantaged youngsters (e.g., migrant students and second generations) will be supported in their social integration and value.
Main focus: topics or modules	Promote the use of audiovisual education in different European didactic contexts. Facilitate the acquisition of digital skills among students such as active communication, collaboration, creativity, problem solving, critical thinking and self-confidence. Promote social inclusion of disadvantaged target groups. Young people will become active creators of solutions for social challenges, while disadvantaged youngsters (e.g. migrant students and second generations) will be supported in their social integration and value recognition.

	Increase public awareness (among schools, education systems, parents, communities, etc.) on the value of audiovisual language as a mean to promote critical thinking and social inclusion. Involve education, training public authorities and key stakeholders from each project country to contribute to the dissemination and upscaling process. Organize two multiplier events in each piloting project country involving at least 20 participants from local community members, parents, policy-makers and key stakeholders in the education and training field and civil society organizations, in order to establish an open dialogue among participants and stimulate cross-sectoral cooperation. Create an international Community of Practice and an online platform to exploit the results and maximise the impact of the project. The platform will contain all audiovisual products developed during the pilot experimentation; Produce policy recommendations on the use of audiovisual contents for inclusive education, which will be presented during the final international workshop in Brussels and will aim to reach policy makers at a European level.
Learning outcomes	Innovative training path for teachers and trainers to facilitate the transfer of the methodology to secondary schools and to the non-formal sector in other EU Countries; Training course and multilingual and multimedia educational contents; Pilot the “Creative audiovisual writing and reading” methodology in five European countries through a three-level training (for tutors/teachers/students) leading to the production of audiovisual contents by young people; The project will involve 15 tutors trained in the transnational training, 60 teachers in a 5-week blended course; 250 students (50 per partner) in creation of audiovisual contents;
Methodology (if applicable)	Tutors, teachers, and students will be educated in the “Creative audiovisual writing and reading” CrAL methodology through a three-level training (for tutors/teachers/students)

Organizing institution	ALL DIGITAL
Language(s)	English, Greek, Italian, Spanish, Croatian, Lithuanian
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	15/01/2021 – 14/01/2024
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Name of Case Study: **Creative Audiovisual Lab for the promotion of critical thinking and media literacy**

Case study No 7	http://youthart.eu/3dlab
Title of course, trainings, project, initiatives etc.	
Type of the case (course, trainings, project, initiatives etc.)	Project
Sector (like medicine, architecture, IT)	IT, Education
Area of technologies (like AI, AR, VR, IoT etc.)	3D desigh and Printing, digital online tools, Arduino, CAD, Apps
Target group	Young boys and girls
Brief description (provide short description in EN, 150-200 words). *For example, aim, goals, what is about, formal or non-formal education etc.*	The project develops a non-formal education environment that provides opportunities for young people to make crafts and physical objects of artistic or practical value with the support of digital technology. The project's main objective is to foster the growth of informal learning environments, which provide opportunities for young people to engage in craft making with the support of digital technology. To achieve this, several action are taken:

	-organising 3D Lab workshops with digital and manual tools providing learning paths from designing and prototyping objects to elaborating them into crafts - hosting this online platform for learning and communication of both young participants and youth workers involved in creative artisan projects - building an online course guiding youth educators on how to integrate digital design and prototyping technology in a craft making space
Main focus: topics or modules	Development of a corresponding workshop programme for youth practice -verification in a specific educational environment -wide dissemination of results -guiding users in the implementation/adaptation of the model
Learning outcomes	I. Introduction to digital prototyping tech: State-of-the-art technology for 3D design and printing and gives some links to other sources, where one can find more information in these fields. II. New Artisans Implementation of the 3D design and printing in present artisans work. After recalling the most important information regarding 3D modelling and printing, we present in details, how 3D technology changes jewellery-making process. Hints regarding implementation of this innovation in other handicraft works, like those using leather, wood, metal, glass and ceramics as raw materials. The artisan production is closely connected with other sectors, and we have to consider that the development of 3D modelling allows greater integration of these fields with undeniable benefits in all sectors. For this reason, the field of architecture and interior design in which artisan production is a strategic factor has been also considered as an example. III. Youth creativity in the digital age How the project's training can be implemented in small makerspace for and with young people interested in different implementations of 3D modeling and printing techniques. Following the lessons one will get information on how to start teaching 3D design and printing and what steps you can take in order to encourage people to create their own models. Examples of specific activities on several different subjects and requiring specific skills going beyond 3D design are provieded as well as tips on

	evaluating the process and showing potential advantages of learning 3D techniques for entrepreneurship possibilities.
Methodology (if applicable)	--
Organizing institution	Centrum Edukacyjne EST - Poland
Language(s)	English, Polish, Italian, Greek
Duration (if applicable) *If the project is ended, the recommendation no later than 5 years, but you can provide older projects*	1/11/2017-31/10/2019
Promotes creativity (please indicate point from 1 to 5, where 1 – is low; 5 – is high)	5

Public institution
Information Technologies Institute