EMPOWER GIRLS' CREATIVITY THROUGH USE OF DIGITAL TECHNOLOGIES

Project Number: 2020-1-LT02-KA227-YOU-007294

June 30, 2023

E-GUIDEBOOK: EMPOWERMENT OF YOUTH WORKERS TO ACT AS MENTORS TO PURSUE GIRLS' CREATIVITY THROUGH THE USE OF DIGITAL APPLICATIONS

Funded by the Erasmus+ Programme of the European Union

This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

PROJECT PARTNERS

The guidebook provides important information on how to activate and support youth workers as mentors to pursue girls' creativity through the use of digital applications. Guidelines will include the best practices, toolkits, and other useful information for youth workers from formal and non-formal education institutions like schools, youth NGOs, public libraries, community centres, various education providers and other stakeholders. Guidelines also aim to **i) share experiences, lessons learned from the pilot stage; ii) describe integration and implementation of the online programme in formal and non-formal educational settings; iii) provide recommendations on how to ensure access to sustainable digital support and mentorship of the youth workers for girls interested in the course.**

CONTENT

INTRODUCTION

Technology-related professions are mostly occupied by men, while women could contribute significantly to the improvement of services and products. This stems from a false but entrenched perception that men are better performers in technology. Thus, several actions have been established with the aim to improve girls' education in technology and STEM and to increase their participation. Youth mentoring is the practice of pairing mentors with young people who need or want a supportive and responsible adult in their lives. Several mentoring programmes have been developed aiming at providing the well-being of youth by providing a role model who can help the youngster intellectually, socially, and personally. Empowering youth workers to serve as mentors is an important step towards encouraging girls' creativity through the usage of digital technologies. Youth workers can become successful mentors who help females develop their digital skills and pursue their passions if they are given the required training, tools, and support. In this effort, it is very important to urge girls to do creative things. Girls can use tools to learn how to use digital apps to express themselves and pursue their hobbies in a friendly environment. The program emphasizes on best practices and shares success stories from girls tech programs, showcasing experiences and achievements to inspire and motivate others. Through these initiatives, girls are equipped with the necessary skills and support to thrive in the digital world, fostering gender equality and diversity in the technology sector.

UNIT 1 GIRLS GO DIGITAL

The aim of this unit is to provide simple, straightforward, and clear guidelines, based on the execution of the newly developed the "Unleash Your CreativITy with Technology" programme, which will help youth workers, mentors, trainers, lecturers, and other staff, navigate their efforts to increase opportunities for young girls in a digital world.

It will help the users understand why the Unleash Your CreativITy with Technology programme is important in the first place, how they can make an impact on young girls and increase their interest in the IT world by following the guidelines prepared.

Enhancing Skills and Building Bridges: Pilot Training

The SparkDigiGirls pilot training provided an exciting opportunity to empower young girls in the digital world, to give them the skills, knowledge, and confidence to pursue careers in technology and to encourage them to become creators and innovators, not just consumers of technology.

The project involved a study where experts provided insights into the lack of female involvement in IT and identified various factors and stereotypes influencing the low involvement and interest of girls in digital technologies. Read more about the study and findings here: http://digigirls.eu/downloads/nuotraukos/sparkdigigirls-io1-report2.pdf).

Delivering engaging content – solving challenges

Taking into account the results of the study, the online programme "Unleash Your CreativITy with Technology" was created. The programme consists of 16 separate learning modules called challenges. Each challenge covers a specific topic or area of interest for young girls age 14+. For example, fashion, design, environment, culinary,

art, etc. Each challenge includes two essential intertwining components: digital technologies (Artificial Intelligence, Augmented Reality, Internet of Things, Programming, 3D modeling and printing, Cloud Computing, Blockchain) and real-life situations or problems that young girls face in their lives. For example, how to make a birthday present in 3D, how to create clothes using programming, develop CO2 footprint, culinary web-site and many other interesting challenges. The table below shows the scheme of how topics, challenges and digital technologies are intertwined and what exact tangible results are reached at the end of implementation of each challenge (Table 1).

Categories and leading technology	Topic	Challenge	Supporting technology	Time	Results
Cloud Computing	Culinary	**#5 Challenge:** Pinch of food creations	Artificial Intelligence	5 hours	Website with Wix.
	Virtual art	**#7 Challenge:** Futurist artist	Blockchain	3 hours	Online gallery where developer puts all arts in NFTs format.
	Data Visualization	**#8 Challenge:** My virtual data-driven stories!	N/A	4 hours	Developed Contact Map of friends.
	Green Europe	**#13 Challenge:** Small changes with big impact	Blockchain; Artificial Intelligence (AI); Internet of Things (IoT).	5 hours	Developed own CO2 Footprint.
	Virtual art	**#15 Challenge:** Cloud in the organization of a bazaar	N/A	5 hours	
Programming	Design	**#2 Challenge:** Being your own designer	Augmented Reality	5 hours	A game in fashion with Scratch; drawing with SketchAR.
	Entertainment	**#6 Challenge:** Tic-tac-toe	Cloud Computing	4 hours	Funny Tic-tac-toe game.

	Games	**#11 Challenge:** Bullying is not just a game!	Cloud Computing	5 hours	Developed a Pong game with Scratch.
	Robots	**#16 Challenge:** Create a robot to help you	N/A	5 hours	Created robot.
Phishing	Cybersecurity	**#14 Challenge:** Don't get hooked on the Internet	N/A	4 hours	Increased knowledge and skills in recognising the types and signs of phishing.
3D modelling and printing	Design	**#1 Challenge:** Birthday Present in 3D	Artificial Intelligence	5 hours	3D smart case for phone with Fusion 360 and soundtrack with AIWA.
	Safe use of technologies	**#12 Challenge:** Safe usage of technologies: 3D models and Augmented Reality	Augmented Reality	5 hours	Developed a 3D model – vase with Vectary and selfie with Metaverse.
Augmented Reality	Design	**#3 Challenge:** My awesome digi room	3D modeling and printing	4 hours	Virtual room with Live Home 3D; drawing with SketchAR.
	Digital marketing	**#4 Challenge:** Business card with AR	N/A	5 hours	Business card with Canve; virtual effects with Assembler EDU.
Artificial Intelligence	Buying and selling	**#9 Challenge:** My digi 'artsy' business	Augmented Reality	5 hours	Developed own Gumroad marketplace.
	Self-branding	**10# Challenge:** Rock your career (Self-branding)	Augmented Reality; Cloud Computing	5 hours	Developed avatar.

Table 1. Description of challenges

More detailed information about challenges can be found in created Curriculum for the programme Unleash CreativITy withTechnology *https://moodle.digigirls.eu/.*

Implementation of all 16 challenges takes approximately 75 hours. However, the duration of the programme can be longer or shorter due to the level of skills of the learners, the number of challenges chosen for implementation, etc.

Each challenge should be completed by following concrete steps of implementation. By following the steps each learner knows exactly where to start from and how to complete it. During the implementation process participants will perform many interactive tasks and ultimately will solve suggested situations or problems.

Each challenge includes:

- *Learning guide* which consists of introduction to the challenge and instructions for learners on how to perform it.
- *Videos* are used to present various digital technologies such as Artificial Intelligence, Augmented Reality, Internet of Things, Programming, 3D modeling and printing, Cloud Computing, Blockchain. Each video aims in a simple way to explain how these technologies work and what they are used for. Videos are either taken from *Youtube* or they are owned by partner organizations. On top of each video an interactive layer is added by using the H5P tool to pay attention to important information in the video.
- *Presentations in pdf or ppt* files are used for presenting concrete tools, activities in a clear and summarized manner.
- *Quizzes* are used to interact with learners and test their knowledge in each challenge.

To complete the programme and receive a Grand Certificate it is enough to finish six challenges from each presented category in the table below. Each category is assigned to key leading and supporting technology. Learners are allowed to choose any challenge from each category and perform it by following provided steps. After completion of each challenge, the learner receives a certificate. When the learner collects six keys, he will be able to unlock the Grand Certificate of the programme.

Self-evaluation

A short quiz is available at the end of each challenge as a test and assessment of participants' knowledge. For each challenge, the partners have designed a simple quiz consisting of 5 questions drawn from the training material of the challenge. The quiz can be taken as many times as required.

H5P

Partners decided to use the 5HP tool to make the content of the programme Unleash CreativITy with Technology more attractive and interactive. The tool makes it possible to add various interactive features to the video of the technology used in the challenge, to create various questions with possible answers in an appealing way. This solution greatly enhances the challenges. It makes the content easier to learn, more engaging and less boring.

Involvement in pilot training of the programme

To carry out the pilot training of the programme Unleash Your CreativITy with Technology, each partner contacted local organizations working with girls aged 14 to 18 (schools, different youth NGOs, local communities). Therefore, in total 275 girls and 43 youth workers piloted the newly created online programme (Table 2).

Country	Youth workers enrolled	Girls enrolled	Type
Lithuanian	13	57	Hybrid
Slovenia	10	103	Online
Greece	12	65	Hybrid
Portugal	11	54	Hybrid

Table 2. Youth workers and Girls enrolled during piloting

Key aims of the pilot training were:

- Engage and empower girls to use technologies, solve real life problems, foster creativity, enhance personal development;
- Gain confidence and perceive the benefits of technologies;
- Make a positive impact on the skills of youth workers' teaching and consulting.

At the beginning of January 2023, the youth workers were trained and girls who were interested in taking part registered on MOODLE. The monitoring was carried out remotely by the partners and in person by the youth workers.

Each partner outlined how the girls could complete the tasks, depending on where the technology was available. The challenges in countries partners were applied differently. In Slovenia only 6 challenges were applied during pilot training. Partner from Lithuania applied for 14 of the 16 challenges. Meanwhile partners from Portugal and Greece applied to all 16 challenges.

Results of pilot training

The pilot training took place over two months, with each partner given autonomy to organize the way they worked with the girls. The initial work was proposed to take place entirely online, with the girls being able to ask for support from youth workers or even partner experts. In the end, only the Portuguese partner kept this methodology, while the others opted to organize face-to-face sessions with the girls and thus motivate them to carry out the challenges. This explains the difference in the number of girls active on Moodle among the different partners (Table 3)

Country	Active Girls	Challenges submitted	Grant Certificate
Lithuanian	61	296	28
Slovenia	53	126	11
Greece	65	118	10
Portugal	12	62	5

Table 3 - Number of challenges completed.

UNIT 2 YOUTH WORKERS AS MENTORS

Introduction

This unit refers to initiatives related to the engagement of girls in digital technologies and STEM and STEAM technologies. The concrete examples provided in this unit demonstrate and highlight these initiatives as well as refer to the different issues that arise during implementation and the possible causes and solutions that can be provided. The role of youth workers as mentors is crucial for the SparkDigiGirls project. Youth workers are responsible for creating a nurturing environment that empowers girls to explore and excel in STEAM and STEM technologies.

Mentoring

As far as mentoring in SparkDigiGirls project is concerned, it is vital for the role of youth workers. They must empower young girls to learn via technology by mentoring them which means that they must be supportive, encouraging, share freely their knowledge and create a dynamic relationship that guides learning and progress.

Definition and Purpose of Mentoring

Mentoring is a safe environment that encourages learning and experimenting and aids in an individual's potential development. In a mentoring relationship, both the mentor and the mentee acknowledge the importance of personal growth. Confidentiality and trust are the cornerstones of effective mentorship.

There are several definitions for mentoring:

"Mentoring is for the mentee. Most of all, for the mind of the mentee. I think that Mentoring needs to focus on and develop the mentee's finest independent thinking about their work, their career, their life, their dreams. The Mentor's perspective is an important ingredient in this special relationship. But it feeds. It is not the feast" – (Kline 2009).

"To help and support people to manage their own learning in order to maximise their potential, develop their skills, improve their performance, and become the person they want to be" – (Parsloe 1992).

Mentoring Styles

Experts on mentoring have identified various mentoring styles. It is important to choose a style or combination of styles of mentorship that works/work best between the mentor and the mentee. Cohen (1995) has suggested the following 6 behavioral dimensions, which depending on the mentor's experience can all be applied in different stages of the mentoring process and form a variety of mentoring styles:

- **Relationship Emphasis**: The mentor focuses on genuinely understanding and accepting the feelings of the mentee through active and empathetic listening. The purpose of this approach is to establish a trustworthy environment in which the mentees feel safe to share and reflect upon their personal experiences. Skills such as responsive listening, understanding of verbal and non-verbal reactions, providing descriptive feedback, and using perception checks to ensure comprehension of feelings, are essential.
- **Information Emphasis**: The mentor offers suggestions or advice to the mentees about their current plans in achieving their personal, educational, and professional goals. In this case, the mentor is expected to ask questions to understand the factual current condition of the mentee, review relevant background to develop adequate personal profile, probe questions which require concrete answers, offer comments and solutions to the current problems, and make decisions based on facts.
- **Facilitative Focus**: The mentor facilitates the mentees through review and exploration of their interests, abilities, ideas, and beliefs. The purpose of this approach is to assist the mentees in considering alternative views and options in making their own decisions. In this case, the mentor is expected to pose hypothetical questions to broaden individual views, make assumptions based on experience and information, offer multiple viewpoints before making decisions and choices, examine the seriousness of commitment to goals, analyze reasons for current pursuits, and review recreational and vocational preferences.
- **Confrontative Focus**: The mentor challenges the mentees' explanations for their decisions and actions concerning their academic development. This is to help mentees attain insight into unproductive strategies and behaviors and to evaluate their need and capacity to change. In this case, the mentor assess carefully the psychological readiness of the mentee to benefit from different viewpoints, reveals the possible negative consequences of constructive feedback on the relationship, confronts the primary goal of self-assessment of apparent discrepancies, focuses on most-likely strategies and behaviors for

meaningful change, uses only the carefully stated feedback necessary for change, and offers comments (before and after confrontative remarks) to reinforce belief in a positive potential for mentee future growth.

- **Mentor Model:** The mentor shares appropriate life experiences and feelings as a role model to the mentees to personalize and enrich their relationship. The purpose is to motivate the mentees to make decisions and take the necessary action. In this stage, the mentor offers personal thoughts and feelings to emphasize the value of learning from unsuccessful or successful experiences; selects relevant examples and experiences from his/her own life or other people's; provides a realistic assessment and positive belief in the mentee's ability to attain goals; expresses a confident view of appropriate risk-taking as necessary for personal, educational, training, and career development; and encourages the mentee to act in order to attain the goals.
- **Mentee Vision:** The mentor stimulates the mentees' critical thinking concerning envisioning their future and to developing personal and professional potential. The purpose is to encourage the mentees to function as independent adult learners. In this stage, the mentor makes statements which require reflection on present and future educational, training, and career attainments; asks questions to clarify perceptions about his/her personal ability to manage change; reviews individual choices based on a reasonable assessment of options and resources; makes comments on the analyses of problem-solving and decision-making strategies; expresses confidence in carefully thought-out decisions; and encourages mentee to develop talents and pursue dreams.

(Cohen, 1995 , Simanungkalit & Rondonuwu, 2020)

Building Relationships

In order, a strong mentor-mentee relationship to be fostered mentors should think the specific points below:

- Mentors should praise mentees when they do well. It goes a long way toward building confidence.
- Mentors should teach by example. This includes demonstrating a positive and professional attitude toward their colleagues.
- Mentors are not supervisors. Instead, they offer support, guidance, and understanding to a new teacher during their first year—a critical professional learning phase.

- The goal isn't to develop a mini-me. Effective teachers come in a wide range of styles and strengths.
- Confidentiality is a must. If a mentor shares information about their mentee with colleagues or administrators, they can damage the relationship.

Example: Sarah, a youth worker in the SparkDigiGirls program, invests time in getting to know the girls individually. By actively listening and showing genuine interest, she builds trust and encourages open communication. This relationship enables Sarah to provide tailored support and mentorship to each girl, addressing their unique needs.

Guidance and Support

One of the most valuable aspects of mentor's role is to provide mentees with guidance and support. In SparkDigiGirls program, the need of this aspect is huge as mentees are young girls with no expertise and no confidence for the world in general. Youth workers can share their experiences and knowledge helping young girls to overcome any obstacle and grasp several opportunities given through their engagement with the project material.

First of all, youth workers provide guidance to help girls understand everything new for them and then make the right decisions in order to complete any task. This can help young girls with their decisions for their career via the best selection of courses, institutions and jobs in the future. Also, the supportive role of youth workers as mentors, can help young girls with challenges, firstly in the project but also surely in

their future, by teaching them how to understand a challenge and then how to find specific pathways to overcome them and achieve the goals via effective problem-solving strategies. Last but not least, it is also crucial for youth workers to build confidence to young girls by giving constructive feedback, being positive and cultivating a robust sense of self-esteem.

Example: David, a youth worker with expertise in computer programming, offers coding workshops and one-on-one mentoring sessions. He guides girls through programming concepts, helps troubleshoot challenges, and encourages them to develop their own projects. David's mentorship enables girls to gain confidence in their coding skills and motivates them to explore coding as a potential career path.

Skills Development

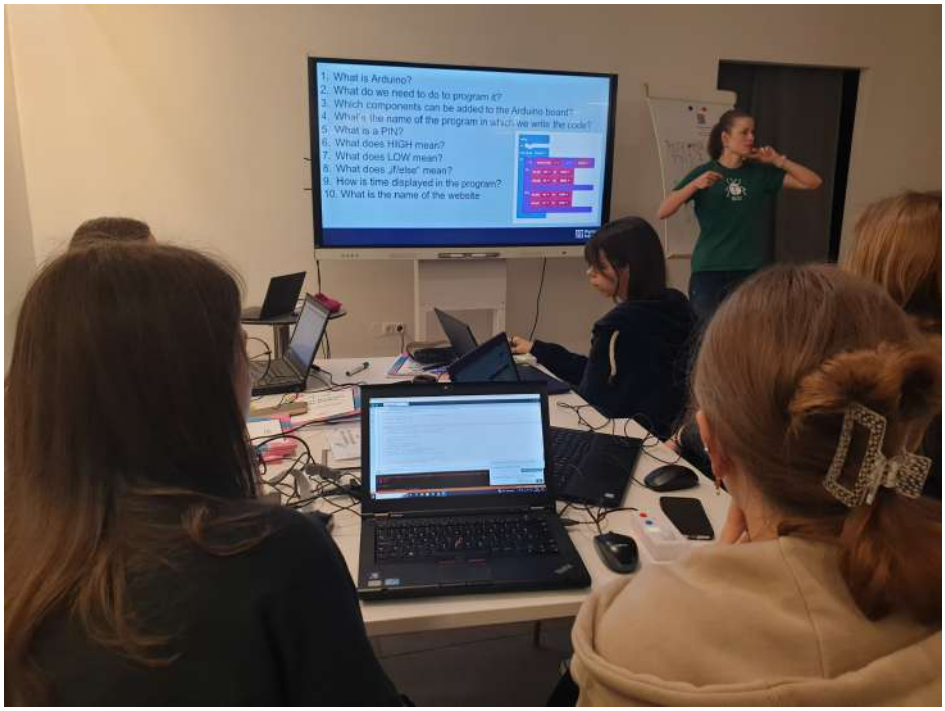
In order youth workers to facilitate skills development; they have to organize various activities. In this way, they can introduce young girls of SparkDigiGirls project on how to learn new technologies, acquire practical skills and generally be familiar with STEM technologies.

Mentoring aims to skills developments. SparkDigiGirls project also aims to young girls' skills development. So it is obvious that the goals of the projects can be meet using mentoring. Youth workers work as mentors in order to empower girls to excel in STEM education and later on their careers by enchasing their abilities.

First of all, youth workers can introduce young girls to fundamental STEM concepts making them capable to use the in a very productive way. Interaction with all this new technology can motivate girls even if some of them joined the project out of curiosity. Also, young girls are empowered to acquire technical skills through workshops and hands-on activities. The most important skill that mentors can equip their mentees with is critical thinking. Critical thinking is the process of analyzing information to get the best answer to a question or problem. By drawing upon their own experience, reasoning, observation and communication with others, young girls can make

informed decisions that yield positive solutions. Critical thinking is crucial as it can help young girls to:

- Improve decision-making, evaluate an argument's validity and its potential impact
- Form their opinions on a topic, develop their ethics and confidence
- Engage on a deeper, more intellectual level with their peers and mentors to form stronger teaching relationships
- Evaluate their work to determine ways to improve quality and efficiency
- Develop better comprehension skills, both in conversation and reading



Example: Lisa, a youth worker specializing in robotics, leads a robotics club for girls in the SparkDigiGirls program. She teaches them the fundamentals of robotics, encourages problem-solving, and guides them in designing and building robots. Lisa's mentorship not only enhances the girls' technical skills but also instills teamwork, critical thinking, and perseverance.

Role Models and Inspiration

Youth workers also must have the skill of acting as role models. Young girls are on the age of growing having a model for inspiration. The try to follow what their mothers do or need to have other models from the era of sports , lifestyle etc. This is the need that youth workers must “use” in order to guide young girls and try to inspire them through their personal example. So, the inspiration ability is the next crucial characteristic of a very good mentor. The personal example helps mentees to gain experience and motivation in several fields that before were unknown or “difficult” for them to enroll. Youth workers must have the ability to:

- do inspiring actions yourself which challenge your mentees to improve
- help them observe others who are inspiring
- arrange other inspirational experiences for them
- challenge them to rise above the mundane and do important things in life
- help them recognize inspiring actions they took in the past and ways to excel again

Furthermore, youth workers as mentors have to break all the stereotypes especially in the fields of STEM. Providing examples of achievements and successes that break gender stereotypes girls can be inspired to excel in any field beyond any stereotype.

Maya, for example, who pursued a career in aerospace engineering, shares her experiences with the girls. She narrates her journey from being the only girl in her engineering classes to working on cutting-edge projects. Maya's story motivates girls to challenge gender norms, pursue their passions, and strive for excellence in male-dominated fields.

The SparkDigiGirls project, acknowledging the importance of role models and inspiration, has created, through its Role Model Campaign, inspirational videos of successful women in the IT sector, to serve as mentorship tools for youth workers.

https://www.youtube.com/channel/UCA4D5hjjFkrN_a45reoeRbA

UNIT 3 EMPOWERMENT AND COMMUNICATION PRACTICES FOR BLENDED LEARNING IN ICT

Encouraging learners, in our case girls aged 14 to 18, and maintaining their interest, focus, and motivation in acquiring new knowledge and skills in the field of ICT is crucial. Effective communication practices play a key role in promoting a successful blended learning experience. This section focuses on how to enhance learners' interest and challenge them to master knowledge.

Blended learning approach

New information and communication technologies, in general, have a significant influence and a major impact on the lives of adolescents in modern society. That is why an increasing number of educational institutions, both formal and non-formal, are opting to incorporate blended learning into the educational process.

Numerous studies have shown that combining traditional educational methods with e-learning and distance learning methods can lead to effective learning. This approach helps overcome the limitations of any single teaching and learning method and enables the integration of technology and pedagogy.

The SparkDigiGirls project used a blended learning approach, which combines:

- online learning (virtual classroom/online learning platform -Moodle)
- face-to-face learning

The SparkDigiGirls project successfully established a positive and inclusive learning environment, with youth workers assuming the role of mentors in both online and physical learning settings. This approach, in conjunction with a combination of traditional and online teaching methods, provided the girls with a diverse range of learning experiences in Lithuania, Greece, and Portugal.

Lithuania

The learning process of the Unleash your CreativITy with Technology programme took place in a hybrid format, combining both in-person and online activities. In the in-person sessions, girls had the opportunity to meet each other face-to-face, receive hands-on support from mentors, and collaborate in group work. Additionally, the Moodle platform was utilized, allowing girls to access online challenges, videos, track assignments and their learning progress, complete tasks, and evaluate their skills at their own convenience.

Portugal

During the face-to-face sessions, the project was introduced to the girls and youth workers, initiating the registration process for the pilot study. Once the data was collected, registration was carried out on Moodle. Following that, an online session was conducted with the youth workers to explain how the challenges were organized on the Moodle platform. The youth workers took on the responsibility of addressing any questions raised by the girls. Subsequently, the girls autonomously completed their work on Moodle, while the mentors monitored their progress and provided feedback on the submitted assignments.

Greece

To support the girls, the Greek partners organized live sessions where they showcased practical applications of the course. They guided the girls through the completion of assignments, providing a step-by-step approach. This hands-on approach helped the girls become familiar with the learning platform and feel confident and competent in completing the assignments.

Slovenia

In Slovenia, the piloting of Unleash your CreativITy with Technology took an experimental approach, focusing solely on the online learning environment and the

concept of asynchronous learning. This approach involved methods and processes where trainees participate in learning activities at different times. The intention was to empower the girls to learn and progress through the content autonomously and independently, allowing them to take ownership of their own learning process. The approach provided opportunities for the girls to create their own objectives, make choices in managing their knowledge, and have a sense of control over their learning journey. The girls acquired knowledge and completed tasks independently (self-learning), at different times, at their own pace, independently of the other girls. The primary role of the online mentors was to create a supportive environment, offering assistance with learning content and motivation to the girls.

Maintaining the learning process and sustaining attention

Regardless of how the piloting was carried out (hybrid or exclusively online), the presence of youth workers as mentors played a huge role in this project. They helped girls reach their full potential in creating educational materials and solving challenges by providing clear guidelines on how to navigate and effectively utilize the learning resources. This support enhanced the girls' learning experience and enabled them to gain new skills.

Interactivity and practical work

Youth workers were a focal point for girls, supporting them in answering questions, solving problems, and providing a safe space for them to express their fears and uncertainties. They guided the girls throughout the entire piloting process and served as a source of inspiration, particularly when the girls felt unsure, believed they would fail, or thought they lacked the necessary skills for certain learning content.

In the hybrid piloting, youth workers utilized various methods to promote interactivity. They encouraged girls to actively participate by expressing their opinions, asking questions, and engaging in interactions with each other.

In Slovenia, where youth workers implemented online learning, where trainees do not engage in real-time simultaneous interactions, interactive elements were used on a personalized and individual level. Specifically, in situations where girls individually addressed their issues, which extended beyond contextual matters related to the learning material. These issues encompassed areas such as motivation, lack of self-confidence, and similar challenges, which were not uncommon.

Furthermore, youth workers facilitated practical activities that allowed the girls to apply theoretical knowledge into concrete practice. They encouraged exploration, creativity, and the development of new skills. For instance, in Greece, the girls were assigned the task of researching women in technology programs and exemplary figures who could serve as inspiration, demonstrating that any goal is attainable.

Other support mechanisms were also available to girls, for example in Portugal the LIED team had a weekly schedule during the piloting period where girls could come to the LIED premises and try out one of the challenge technologies.

Youth workers in all partner countries employed an interactive and hands-on approach to deliver high-quality and engaging training to the girls. They fostered their interest, developed their skills, and supported them in overcoming any potential obstacles in their learning journey.

All youth workers actively communicated with the girls during the training and provided them with an open and supportive communication environment for dialogue.

Open communication and motivation

To keep the girls involved, connected, motivated, and informed, maintaining an open and supportive communication flow was essential.

During the piloting, three of the partners implemented a blended learning approach, which combined traditional face-to-face communication with online learning

communication components. In contrast, in Slovenia, only online communication methods were utilized.

In all partner countries, clear expectations regarding the course structure, objectives, assessment criteria, and participation requirements were effectively communicated to the girls during the piloting phase. This communication took place through face-to-face interactions or online channels in the case of Slovenia.

As for the language used in communicating with the girls in all partner countries, the communication messages employed a clear, informal, concise, positive, inclusive, respectful, and empowering tone, so that girls felt comfortable and relaxed when communicating aiming girls to encourage and to embrace challenges, celebrate their successes, and persevere through setbacks. Moreover, the individuality of each girl was taken into consideration, and personalized attention was provided when needed to address their specific needs, interests, and aspirations. This approach created an open two-way dialogue that encouraged their active involvement.

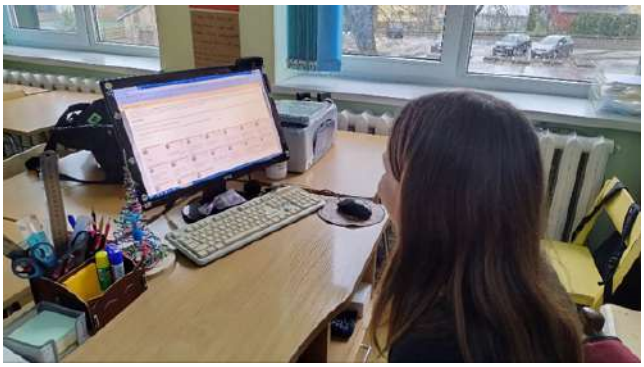
In addition to direct in-person interaction in Greece, Portugal, and Lithuania, all partners utilized the Moodle platform and email to provide feedback to the girls. Positive feedback messages were given for all completed learning challenge submissions, even if the challenge was not fully completed. Youth workers acknowledged what was done correctly and provided suggestions for improvement. Furthermore, messages were sent to motivate the girls to undertake more challenges, as it was necessary to achieve the Grand Certificate.

In Greece to further support for the girls, a Facebook group was formed in order be able to answer any questions in a timely mode and ensure prompt assistance to minimize disruptions in their learning journey and in Lithuania Messenger and Instagram were used for additional communication with the girls. In Slovenia during the whole piloting e-mails with motivational content were send to girls on weekly basis, and e-mail was also used for individual communication, as well as the forum in Moodle.

Girls in all partner countries were well-informed about the specific communication channels and designated youth workers they could reach out to in case of any doubts or problems. This ensured that they had clear guidance on how and where to seek assistance when needed.

UNIT 4 BEST PRACTISES AND SUCCESS STORIES FROM THE SPARKDIGIGIRLS PROJECT

Best practices in pilot training

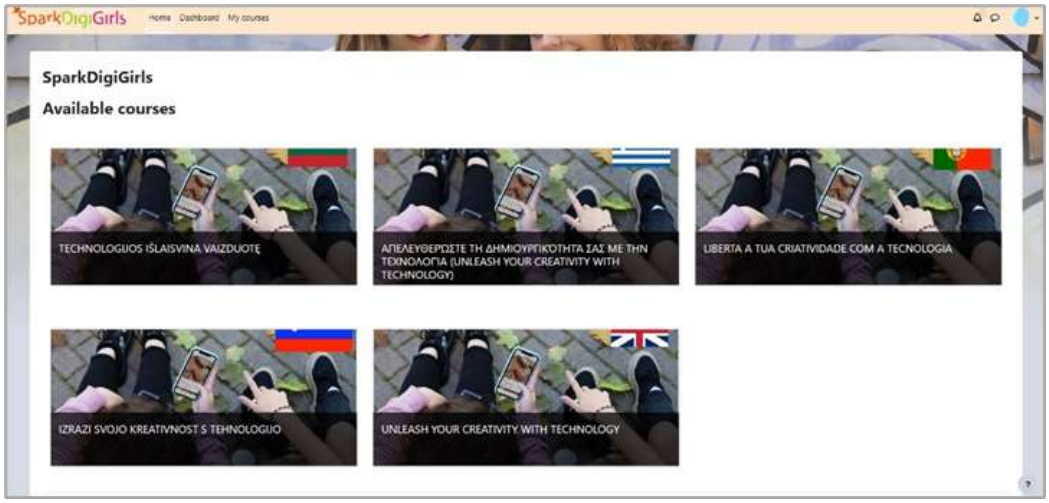


The training was organized in a blended learning approach, where girls can complete tasks independently under the supervision of youth workers.

The training included remote workshops and face-to-face LTTA activities, which were hosted by project partner Simbioza in Slovenia.

In order to get girls interested in technology, it was decided to use various forms, methods and activities.

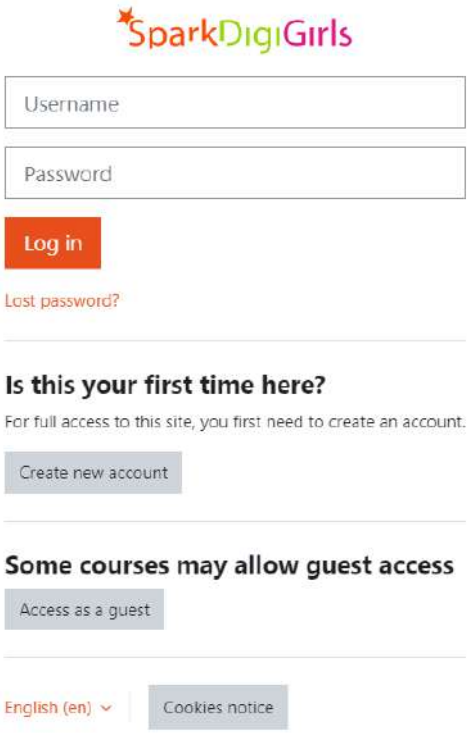
Digital resources and online learning platform



The SparkDigiGirls project uses digital resources and an online learning platform, where pilot training has taken place. At the end of the project, youth workers and girls are able to use the developed resources for their own activities, lessons, camps, events, etc. Access to the training environment is open and free of charge to all, registration is required to solve challenges, to test knowledge, to track participants' progress, to receive certificates etc. Challenges and other resources are available in Lithuanian, Portuguese, Slovenian, Greek and English. The English course allows participants in other countries to use the content and integrate it into their own activities.

The online resources are accessible for registered learners on Moodle platform. This decision was taken to allow mentors and youth workers to track the progress of the participants, while at the same time communicating and providing feedback on a single platform. Moodle allows for the learners to easily use online materials with interactive references to other resources, to consult online and successfully participate in the learning process. The link to the Unleash CreativITy withTechnology

programme's online platform is as follows: https://moodle.digigirls.eu/login/index.php



Workshops

The training can include interactive workshops where participants actively use the knowledge they have acquired during the challenges. During the workshops, participants work in groups, discuss, and find solutions together. These activities encourage cooperation and learning from experience.

During the training, the project partners organised various activities where the girls had to use various innovative IT tools to present their country, work in teams and then present their work to the whole group. During the training, the girls not only got to know the partner countries, but also learnt about new IT professionals who are mentors and guest speakers who share their experiences, insights and career paths

Exploring technologies

Solving challenges encourages participants to explore different digital technologies and tools. Through the challenges, participants learn how technology can be safely and responsibly applied in practical situations, so they develop technical skills and a better understanding of different digital domains. This approach helps to break down negative perceptions that IT is about programming and that IT is a male profession.

Role Models

Project partners developed a digital Female Role Model Campaign which is aiming to tackle and demystify existing negative stereotypes about computer science and technology among girls. This campaign provides participants with guidance and inspiration not to be afraid to choose technologies. Female role models provide participants with advice and inspiration helping them understand what the IT sector has to offer.

As a result, 12 videos of successful women from the IT sector in Lithuania, Portugal, Greece and Slovenia were created and integrated into the learning platform. This allows girls to be introduced to career opportunities in the same environment. Girls can watch videos on career choices, find answers to choosing their future career path and learn more about opportunities in IT.

To reach an even larger audience, it has been decided to upload the videos to SparkDigiGirls Youtube channel: https://www.youtube.com/@SparkDigiGirls.

The challenges are also spiced up with quotes from women working in IT. The quotes are graphically designed and uploaded to the moodle for each challenge:

1. "Gender stereotypes are still prevalent in our society. For example, even toys tend to be divided into girls' and boys' toys." *(Viktorija Mačiūnė, quality assurance engineer, Lithuania)*
2. “Different computer video games tend to increase boys 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.” *(Carolina Salgueiro, systems consultant at Nexllence, Portugal)*
3. “Girls are persistently underrepresented in computer science at all grade levels at school. Therefore, it is necessary to act from 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, 10th, 11th and 12th.” *(Vânia Ramos, Professor at University of Lisbon, Portugal)*
4. “Many girls think that people who work in IT sit in front of computer screen from morning to late night and programming. But that is a myth. Underneath the IT sector there are many different job positions like graphic designer, data analyst, engineers, IT project manager, etc.” *(Renata Daniellenė, lecturer at Vilnius University Kaunas faculty, Lithuania)*
5. “We see fear of using digital technology among primary school teachers. Different measures should be considered to encourage teachers to use ICT in pedagogy.” *(Petra Vanič, head of non-formal education and capacity development programme at Kersnikova Institute, Slovenia)*
6. “Each school including computer science teachers should give a chance to the girls to talk about computer science or STEM field. Create conditions to discuss together with girls what they like or dislike about science, engineering, technology, and maths.” *(Laura Grinevičiūtė, director of the Rural Internet Access Points Association, Lithuania)*

7. “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 based on concrete examples. It is therefore very important to widely publicise stories of female excellence in IT.” *(Brigita Dane, project manager at Simbioza Genesis, social enterprise, Slovenia)*
8. “The historical and cultural legacy and stereotypes contribute to this relationship of women being more suited to the social and human sciences than to the exact sciences is transposed to this relationship of women and technology.” *(Anícia Trindade, Techer, Polytechnic Institute of Tomar, Portugal)*
9. “Successful women in IT sector or ICT educators at school need to be a 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 be.” *(Danguolė Rutkauskienė, the President of National Distance Education Association, Lithuania)*
10. “I've been working in the IT community for 8 years now and I witness very positive fact - the number of women working in IT sector has been growing fast in recent years.” *(Gintarė Dzindzelėtaitė, Devbridge, Lithuania)*
11. “I have always had support from my friends and of course my family. The biggest challenge or obstacle I had was myself. It was when I realised that I could listen to all the advice, but only hear myself and my inner desire to succeed and to do what I really love to do, That I learned to gradually overcome these obstacles.” *(Božidarka Radović, Better Meds, Product Lead, Slovenia)*
12. “Luck requires hard work and today I consider myself a lucky woman, for doing what I like, and for being valued for my work, but that only comes with a lot of dedication, both at school and professional level.” *(Cristiana Pereira, Full Stack Developer Alumni in IPT - Informatics Engineering, Portugal)*

Ways of engaging girls in digital technologies

The following part describes ways and forms to engage and increase interest of girls in digital technologies. All activities listed below were implemented during the project lifetime and have shown success.

Digital campaigns

To attract attention to the project, its activities and results the project team in all partner countries actively participated in very well known international campaigns such as Safer Internet Week, International day of Girls, International Girls in ICT Day. Different types of events were organized. For example, online hackathon “Don't get hooked online” where girls from Slovenia, Lithuania, Greece and Portugal were invited to join the event.

International activity: Spark IT up! training in Slovenia

The Learning and Teaching Training Activity (LTTA) was an important part of created new online programme Unleash CreativITy withTechnology. 16 girls and 8 youth workers from Lithuania, Slovenia, Portugal and Greece were engaged in a five-day training called Spark IT up! in Ljubljana, the capital of Slovenia. It took place on 24-28 of April, this year.

The added value that the LTTA brought was to equip the girls and the youth workers with the competences in the created online programme so that they could become a gateway or an ambassador for the local girls who are willing to learn and participate in the programme. In addition, LTTA activity also created a stronger feeling of ownership and commitment to the project results among youth workers and girls.

Day 1 the attendees were welcomed to the event and provided with an overview of the LTTA program and activities that would be carried out over the next five days. Day 2 began with an introduction of technologies, explanation of how they shape and

change our lives. It was continued by team work sessions to create own small projects in a given theme. The aim of the task was to come up with creative ideas (solutions) about each country on a given topic and suggested technologies such as AR, AI, Cloud Computing. In the afternoon all participants visited Jožef Stefan Institute, the leading Slovenian scientific research institute. Day 3 began with an introduction to Arduino and its functionalities. It continued again with a teamwork session on creative use of technologies. During day 4 attendees had an excursion organized by the host to visit a seaside of Slovenia. The last day of the training was dedicated to the development of digital content and evaluation of the LTTA.


VODNIK

Certificates

In this project certifications were designed as an award for the learner to verify his successful completion of the program Unleash Your CreativITy with Technology. The certificates are displayed in Moodle as a document stating that a girl has been trained, educated and passed a certain amount of learning modes – challenges.

The project created two levels of certificates: for each learning mode (challenge) and Grand Certificate. The type of certificate depends on the number of challenges completed by the learner. For example, if a learner completes one challenge, he receives a challenge certificate.

Certificate for Augmented Reality

Certificate for Artificial Intelligence

To receive a Grand Certificate it is necessary to complete six challenges from each technology (Artificial Intelligence, Augmented Reality, Programming, etc.). After completion of each challenge, the learner receives a certificate with a certain key. When the learner collects six keys, he is able to unlock the Grand Certificate of the programme.

Grand certificate also has a symbolic meaning. It was designed by Lithuanian Graphic designer Austeja Jakaite. The certificate represents a girl surrounded with six technologies: AI, AR, Cloud Computing, 3D modeling and printing, Phishing, Programming). It is a eye-catchy and original certificate. It could be shared on social media or printed out.

GRAND certificate awarded for 6 challenges

Direct meetings with girls

Another very effective way to increase interest in technologies and attract attention to the topic were direct meetings with the target groups - girls and youth workers. Project partners were organizing discussions at different schools and during children summer camps. During these events girls had a chance to get information about the project in detail, to talk about stereotypes, attitudes, to test some of the already created content of the programme.


SparkDigiGirls


Molėtų
progimnazija

Contest

Organizing a contest is one more attractive way to engage girls in the project. Project partners launched a competition for youth workers and girls who were taking part in the piloting of the programme Unleash Your CreativITy with technology. It was a very successful promotional tool to attract attention, increase motivation and win a very valuable prize - a trip to LTTA in Slovenia.

Dissemination on Social Networks

In order to raise awareness of the project among young people and attract more young girls, project partners decided to disseminate project activities, results on social media. For that purpose, the Instagram account SparkDigiGirls was created. Eye-catching, animated content featuring girls' work was constantly posted there. All the posts can be found: https://www.instagram.com/sparkdigigirls/.

To increase the appeal of the program Unleash CreativITy with Technology, the partners created engaging short videos for each training mode - challenge:

Challenge #1: https://www.instagram.com/p/CqaXRorL8Gb/

Challenge #2: https://www.instagram.com/p/CpAoI76LBdY/

Challenge #3: https://www.instagram.com/p/Comk3JIoyLD/

Challenge #4: https://www.instagram.com/p/CsVkMYUrNmd/

Challenge #5: https://www.instagram.com/p/Cpzg0wwsUKX/

Challenge #6: https://www.instagram.com/p/CpfakXENGPd/

Challenge #7: https://www.instagram.com/p/CraxAAlOq2J/

Challenge #8: https://www.instagram.com/p/Crinc6IPj3l/

Challenge #9: https://www.instagram.com/p/Cr-7FmMPlJ6/

Challenge #10: https://www.instagram.com/p/Csnpb9SpUN0/

Challenge #11: https://www.instagram.com/p/Co4x-UZvAVo/

Challenge #12: https://www.instagram.com/p/Cq-k2WDv1_d/

Challenge #13: https://www.instagram.com/p/CoeXpOCo3lR/

Challenge #14: https://www.instagram.com/p/Crz4yYusoi-/

Challenge #15: https://www.instagram.com/p/CtLjhYzRZL5/

Challenge #16: https://www.instagram.com/p/CtL7jwyNOoo/

Also on Instagram the most interesting created solutions of completed challenges were shared.

Reflections and feedback from the pilot training

Feedback was continuously collected during the training, both remotely through simple survey forms, gamified interactive activities (e.g. using Mentimeter) and directly through the youth workers. During reflection, participants were encouraged to reflect on their learning, identify areas for improvement and set personal goals. Such an approach promotes self-awareness, continuous improvement, and a growth mindset among participants, while providing course developers and mentors with information about training content, quality, and the most engaging activities and assignments.

At the end of the pilot participants were asked to fill in an online evaluation questionnaire and provide reviews about their experiences and opinions. Responses show very positive feedback.

First, participants highlighted how useful are technologies in finding solutions to real-life situations:

"Before this project, I mainly used different mobile applications, tools for entertainment. After being involved in the online course, I realized that the IT world is much wider. I have learnt a lot of new things: augmented reality, 3D modeling and printing, graphics, video editing and even programming. And what surprised me the most was that it is not as complicated as it seemed. it is just a matter of thinking, experimenting, and doing. It was fun!" (Lithuania)

"SparkDigiGirls project was an interesting experience because I understood how technologies can support the development of visual art, which is my hobby. I'm pleased to know that the skills I gained during the learning process I will be able to use in my studies." (Slovenia)

"It was an opportunity to discover different branches of technology and programming which I believe will later be useful and helpful to me." (Greece)

"Within this project I had the opportunity to develop my digital skills and come to the conclusion that technology is not as complicated as it is initially presented." (Greece)

Attendees also found meaningful connections and encountered many remarkable moments and people throughout the project:

"SparkDigiGirls project will remain in my memories and in my heart. It has given me a lot of useful knowledge, helped me to improve teamwork skills and introduced me to other cultures. I am very grateful for the opportunity to learn and discover so many useful things". (Portugal)

"My participation in this project was a quite interesting experience as through it I was given the opportunity to enrich my knowledge of the things that can be created by someone using simple programs. I was also given the opportunity to meet new people and work with them." (Greece)

"It was so exciting news to find out that our team won the competition, and we are going to Slovenia! It was my first trip abroad and I spent such a great time interacting and collaborating with girls from Portugal, Greece, and Slovenia." (Lithuania)

UNIT 5 ADDITIONAL RESOURCES

This unit includes different resources which could further empower the tech education and participation of girls. Examples about student engagement techniques, STEM education, creativity in the classroom, motivational games for students can help mentors, youth workers, teachers, and even parents. With the coverage of different topics girls and their mentors will be able to improve their practices and acquire a variety of digital skills which are imperative in our times.

Example 1 – Duarte

Source: https://www.duarte.com/resources/guides-tools/

This site is specifically designed to provide free templates, guides, and tools to help you write, design and deliver better presentations. It includes featured guides for better results.

Example 2 – PGI: Toolkit for Best Practices in Participant Engagement

Source: https://tdin.ca/resource.php?id=497

The Toronto Drop-In Network (TDIN) is an active member-based coalition of 59 organizations. It provide various resources such as the toolkit for best practices in participant engagement.

Example 3 – Audience Engagement Strategies for Your Presentation

Source: https://www.youtube.com/watch?v=yXJwpXHCktc

In this video, you'll go over: how to engage an audience in a speech, including what works and what doesn't, ways to engage your audience that actually work, etc.

Example 4 – Building girls' interest in STEM education

Source: https://unesdoc.unesco.org/ark:/48223/pf0000372310.locale=en

This advocacy guide aims to support participants, and others interested in engaging women and girls in STEM studies and careers.

Example 5 – Go Science Girls: Empowering Girls in STEM

Source: https://gosciencegirls.com/

Go Science Girls is a blog that helps parents and teachers who are looking for fun filled science experiments and activities.

Example 6 – 'STEM-ulated' Youth Workers

Source: https://cms.wellcome.org/sites/default/files/stemulated-youth-workers-wellcome-feb16.pdf

This report contains details of a few of the *STEM* sessions run by The Prince's Trust Fairbridge staff after training from experts in informal *science* learning.

Example 7 – Creativity in the classroom

Source: https://www.youtube.com/watch?v=nASvIgSOCxw

In this video, Catherine Thimmesh discusses why creativity is an essential tool for today's students, and how teachers can easily encourage and foster the development of creative thinking skills.

Example 8 – Creativity in the classroom

Source: https://www.duarte.com/wp-content/uploads/DeliveryTroubleShooting_V23_SP-01-1.jpg

In this guide, you can find some tips for engaging audience during a presentation and especially ways to refresh their interest about it.

Example 9 – What makes a good teacher great? | Azul Terronez | TEDxSantoDomingo

Source: https://www.youtube.com/watch?v=vrU6YJle6Q4

In this video, Azul Terronez the author of the best-selling book "The art of Apprenticeship", presents how to coach teachers and schools leaders around the

world in Spain, Chile, Canada, India, United States and China and he is currently serves as a teacher coach at Shanghai American School.

Example 10 – 39 Communication Games and Activities for Kids and Students

Source: https://positivepsychology.com/communication-activities-adults-students/

In this site you can find science-based tools that will help you and those you work with build better social skills and better connect with others.

CONCLUSIONS

This guidebook is meant to help youth workers, teachers, trainers, lecturers, and other staff empowering young girls in the digital world, by giving them clear directions. The Unleash Your CreativITy with Technology programme is an innovative way to get more girls interested in the IT field. By following the online lessons, girls can enhance their digital skills, thus having more chances to grow and be successful.

Youth workers play a crucial role within the SparkDigiGirls project because they help with the guidance of girls. They can offer a safe place for young girls to explore STEM areas and help them follow their interests in science, technology, engineering, and maths, by building relationships, giving advice, and sharing their knowledge. As teachers, they have a huge effect on the lives of young girls and are able to motivate them to reach their full potential.

The SparkDigiGirls training methodology combines workshops, project-based learning, mentoring, peer collaboration, and reflective practices. This strategy provides students with digital skills as well as the ability to think critically. The pilot programme showed that when technology is presented in an engaging and fascinating way, girls are eager to learn. By allowing the girls to choose the chores that they find most fascinating, they become more interested and are more likely to complete them.

According to the participants and mentors of the Unleash Your CreativITy with Technology programme, girls had a chance to be trained and share their experiences. The supportive environment, the role of mentors and the engaging activities played a positive role. The blended implementation of the program along with effective communication tools, supporting mentors and peer and collaborative learning are some of the key factors of improving the participation of girls in technology projects. Another advantage of the SparkDigiGirls project is the creation of resources which are available to both students and teachers and can be used to enhance their teaching and learning activities.

REFERENCES

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2017). Cracking the code: Girls' and women's education in science, technology, engineering, and mathematics (STEM). Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000253479

European Institute for Gender Equality. (2019). Gender Equality in STEM: A practical guide. Retrieved from https://eige.europa.eu/gender-mainstreaming/tools-methods/gender-equality-training

European Schoolnet. (n.d.). STEM Alliance eLibrary. Retrieved from http://www.stemalliance.eu/documents/99712/104016/TDS+-+Collection+of+Best+Practices/7cfbadca-ae34-4be2-9866-5218efae5be8

National Girls Collaborative Project. (2023). Resources. Retrieved from https://ngcproject.org/resources

DuBois, D. L., Holloway, B. E., Valentine, J. C., & Cooper, H. (2002). Effectiveness of mentoring programs for youth: A meta-analytic review. American Journal of Community Psychology, 30(2), 157-197.

Simanungkalit, A. G. L. R., & Rondonuwu, J. (2020). Mentoring Style, Self-Description, and Academic Achievement in English class. Acuity : Journal of English Language Pedagogy, Literature and Culture, 5(1), 1–11. https://doi.org/10.35974/acuity.v5i1.2219

Covington, M. V. (2000). Goal theory, motivation, and school achievement: An integrative review. Annual Review of Psychology, 51, 171-200.

Lepper, M. R., & Henderlong, J. (2000). Turning "play" into "work" and "work" into "play": 25 years of research on intrinsic versus extrinsic motivation. In C. Sansone & J. M. Harackiewicz (Eds.), Intrinsic and extrinsic motivation: The search for optimal motivation and performance (pp. 257-307). Academic Press.

European Commission. (2019). Digital Education Action Plan: Promoting digital literacy, competences, and inclusion. Retrieved from https://ec.europa.eu/education/education-in-the-eu/digital-education-action-plan_en

Kafai, Y. B., & Peppler, K. A. (2011). Youth, technology, and DIY: Developing participatory competencies in creative media production. Review of Research in Education, 35(1), 89-119.

International Society for Technology in Education (ISTE). (2023) Student engagement in a digital world. Retrieved from https://www.iste.org/standards/iste-standards-for-students

National Center for Women & Information Technology (NCWIT). (2023). K-12 resources. Retrieved from https://ncwit.org/k-12/

EdTech Update: Expert insights. Personalized for you (2023). Retrieved from https://www.edtechupdate.com/khan-academy/stem/