Good practices for digital skills education

GiTeC

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girls code fun

This publication is a result of the GiTeC project.

It lists and describes the good practices collected for the project.

The practices were collected according to a 5W1H method of description, that is:

Why: *the context, problem or issue that the practice tackled, and the pursued objective(s);*

What*: the main activities implemented and the results achieved;*

Who: *who played the main role(s);*

to Whom: *the main target(s);*

Where: *the learning environment;*

How: *the method used*

Topics include: coding, 3d printing, cybersecurity and social networks, robotics.

www.gitecproject.eu

Good practice: PROGRAMMING SKILLS FOR GIRLS
(Project: YOUNG CODERS SCHOLARSHIP)

OVERVIEW

Young Coders Scholarship is an annual scholarship for girls ages 8-15 in Warsaw, Poland. The goal is to offer girls a free semester of programming education with the partner school, Kids Code Fun. The project is aimed for girls both with and without experience in programming, as they can choose from a number of courses to attend.

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WHY _ *the context, problem or issue that the practice tackled, and the pursued objective(s):*

According to a new study by Microsoft Europe, girls start to lose interest in STEM (Science, Technology, Engineering and Mathematics) by the time they turn 15 years old. In practice, we see that this happens at an even earlier age. Girls seem to lose interest in these subjects even by the time they turn 11 or 12.

When our partnering programming school offers courses for children, it is often the case that 70-80% of new students are boys.

WHO _ *who played the main role(s) (educators, mentors, youth workers, volunteers...)*

In our scholarship program, our program coordinators work to promote and coordinate the scholarship and recruitment process.

The girls who receive the scholarship go on to study for a semester at our partnering programming school for children, Kids Code Fun. The teachers who teach at Kids Code Fun are young specialists working in the field of IT, who have been trained by our staff, and use our curriculum to teach students programming skills.

to WHOM _ *the main target(s)*

Girls ages 8-15 in and around Warsaw, Poland. We accept applications from both girls who have never programmed before, and girls that have experience with coding. Since Kids Code Fun offers courses for both beginners and advanced students, we allow our scholarship winners to choose the course of their choice.

WHAT _ *the main activities implemented and the results achieved*

Our organization promotes and awards 5-7 girls for an annual scholarship program in Warsaw, Poland. Course semesters last 10 weeks, meetings are held once a week for 1.5 hours.

WHERE _ *the learning environment*

Kids Code Fun courses are led at the University of Technology in Warsaw. Classrooms are equipped with stationary computers, wifi, and necessary materials for instructors (projectors, flipcharts).

HOW _ *the method*

In the spring of every year, our organization begins its recruitment process for our annual scholarship program. We ask applicants to send us an essay or a short film answering a question pertaining to education or technology (for example, tell us about a way in which you believe technology can solve a world, or local problem).
Applicants have until August to send us their applications, and we announce the winners of the scholarship in September. Since Kids Code Fun semesters begin in late September or early October, this gives our foundation almost a full month to allocate the girls in the course of their choice.
At the beginning of the semester, we meet with the scholarship winners for a group photo and give them foundation T-shirts, pins, and stickers. When the course comes to an end, scholarship winners, as all other students in the course, are asked to fill out a questionnaire about their experiences attending the course.

-**Website:** *https://www.girlscodefun.pl/en/young-coders-scholarship/*

- **Author(s):** Karolina Cikowska, GIRLS CODE FUN

Good practice: DIGITAL SKILLS FOR WOMEN
(Project: CITY CODING CIRCLE)

OVERVIEW

City Coding Circles are organized regularly for women who would like to develop their technical skills. Courses are introductory and primarily for beginners. Topics include introduction to front-end development, WordPress, SQL, Javascript Apps, and UX Design.

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WHY
In Poland, only 10% of computer science majors are women. Furthermore, women make up only 20% of jobs in the IT sector. As technology is the future, many women are interested in developing their technology skills, but often do not know where to turn. Although there are a few organizations that provide programming workshops for female beginners, it is often very difficult to get into the program, and the courses are often very short (2-3 hours in length) Furthermore, there are a number
bootcamps that offer 6 months of full-time programming education, but many women would like to get a taste for the basics before making such a career-changing decision.
City Coding Circles are a solution to these problems, as our foundation offers 10 hour courses where
women can learn in an open, and friendly atmosphere. During our course, participants can get a feel for the topic they are learning and decide if this is something they are interested in pursuing further or not.

WHO
The main roles in the project include our program coordinator and educators who work in the field of technology. The project coordinator promotes classes, recruits participants, and communicates with attendees and educators.
Educators are women and men who work in the field of technology, and additionally choose to teach others in their spare time. We find that it is not difficult to find specialists who are willing to teach others, as many individuals working in technology are very keen on passing on their knowledge further.

to WHOM
The main target group for the City Coding Circles are women ages 20-40 years of age. Usually these women studied, or are studying a subject that is not related to technology but would like to boost their careers or are interested in entering the tech field.

WHAT

Organizing 10-hour workshops on various tech-related subjects. Usually our organization organizes 2-3 courses every quarter. Participants attend workshops, either on a weekly basis (2 hours a day, once a week in the evenings, for 5 weeks) or in the form a weekend bootcamp (5 hours on Saturday, 5 hours on Sunday). On the last meeting, participants receive a certificate for completing the course, and are asked to fill out our participation survey.

In order to build an online community, a Facebook group has been created, allowing our organization to keep our network updated on new course offers, sharing photographs from workshops, obtaining information from the network (polls on which subjects they would like us to offer in the future). At the moment the group has 639 members.

WHERE

Workshops take place in a physical classroom, and participants are asked to bring their own laptops to lessons (however, if someone does not have a laptop they can bring with them, we provide them with one). Average class size is led for 10-12 attendees, with a maximum of 20 attendees per group.

It is necessary that the classroom has internet access and a projector. Our organization has decided to cooperate with a local co-working space which allows us to run workshops in their conference room at a very convenient location in Warsaw.

HOW

Every educator who decides to teach with our foundation has the freedom to teach using their own ideas and lesson plans. When our organization first begins cooperation with a new educator, we first ask to see their CV's, as well as a lesson plan that they have prepared.

Once a course is over, it is also important for us to see what kind of feedback we receive from attendees about the courses. This helps us get a better understanding for how the courses should be led, if courses have fulfilled participants' expectations, and if there is anything that should be changed in the future.

It is important for our organization to understand what topics are interesting to women who are just beginning their adventure in technology, this helps us find the right educators to work with, and develop our program further. For example, after getting positive feedback from participants about our Front-End Starter Kit course, as well as many requests for a continuing course, together with the educator a decision was made to offer a more advanced course on the topic.

-**Website:** www.girlscodefun.pl/en/city-coding-circle/

- Author: Karolina Cikowska, GIRLS CODE FUN

Good practice: WORKING WITH DISADVANTAGED YOUTH

(Projects: Very Senior Developers, Programming at Roche, Foster Care teens)

OVERVIEW _ *Our best practice is teaching programming skills to disadvantaged youth in Poland. This includes groups like children in foster care and children of migrant/refugee families.*

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WHY

Although programming education for children has become very popular in Poland in the last few years, there are many children who do not reap the benefits of the newfound popularity in this subject. One of our foundation's main objectives is to make technology education more accessible to minority populations, including girls and impoverished populations.

WHO

Educators and volunteers worked to teach children from impoverished families, foster homes and refugee families in our projects.

to WHOM

The main targets of our projects were children from foster homes (groups aged 6-16), children ages 8-12 from a local community center for children of impoverished families, as well as children from refugee families (a girls only group ages 8-12).

WHAT

Our organization has completed a few projects with children from foster care. These include:

-Very Senior Developers (2 editions) - children ages 6-8 learned to programming using Scratch Jr. Lessons were led by seniors that were trained by our educators earlier. Children ages 9-15 worked on Maker and graphic design projects in pairs with seniors.

- Programming at Roche- a group of 14 children from a community day care centre for impoverished families were invited to participate in a 10-week programming course in Scratch at Roche. We trained the volunteers working at Roche, prepared educational curricula, and supported volunteers during lessons.

-Foster Care teens - We recruited 12 foster care teens (ages 15-17) and taught them HTML +CSS at the University of Technology. The semester lasted 10 weeks- 15 hours in total. Students were invited to attend a trip to the Facebook office in Warsaw during their semester, and we had a pizza party to celebrate their last day of class.

WHERE

Our lessons took part in various locations, depending on the program.

Very Senior Developers (2 editions) - these lessons took place at a partnering company's office- IGT Poland in Warsaw, Poland. This is a corporate office location. The classrooms were equipped with tablets (for the younger group) and laptops, art materials, and maker educational equipment (micro:bit, makey-makey, arduino sets) for the older groups.

- Programming at Roche- these lessons took place at the sponsor's office- Roche Poland- a corporate office location. The classroom was equipped with laptops, wifi and a projector.

-Foster Care teens - these lessons took place at the University of Technology in Warsaw, Poland. The classroom was equipped with stationary computers, wifi and a projector.

HOW

Very Senior Developers (2 editions) -

1 Edition Very Senior Developers-

Group 1: 6-7 year olds from foster care. We began by training seniors in teaching scratch jr to children. We then led five 2-hr workshops in Scratch Jr. for a group of 12 children- the lessons were led by an educator and a trained senior. We created a curriculum for teaching Scratch Jr. to children in this age group.

Group 2: 8-12 year olds from foster care + seniors 55 years old and older. We began by working with a graphics specialists and creating a movie design curriculum for our students. We then led five 2-hr workshops in movie design and social media promotion for our students- foster care children were paired with seniors. Students learned about creating their own short animations for the first four lessons, then learned how to promote their projects on social media during the last lesson.

2nd edition Very Senior Developers:

A group of foster care children ages 11-14 (seven children) and seniors aged 55+ (seven seniors) were recruited for our project. We created a maker tech curriculum for 10 workshop hours. The curriculum included working with micro:bit, Scratch, Makey-Makey and Arduino sets. Participants were paired off into child/senior partners and worked together on projects where they learned the basics of programming and electronics.

- Programming at Roche- our team created a curriculum with Scratch and Scratch for students, and trained volunteers at Roche to lead lessons. We then attended the first three, out of ten, lessons and supported the volunteers in leading the classes. Children learned to create their own games and animations in Scratch Jr and Scratch.

-Foster Care teens - our team worked with a local foster home to recruit a group of foster care teens and we invited them to attend 10 1.5-hour lessons at the University of Warsaw in Poland. We created a curriculum in HTML + CSS and two educators led all the lessons. Towards the end of the semester, we organized a trip to Facebook headquarters in Poland, where students had the opportunity to get a tour of the impressive office space, and meet engineers who work at Facebook, as well as ask them questions about becoming a programmer at Facebook.

- Other information/resources:

Very Senior Developers: https://www.youtube.com/watch?v=_oiy8MB71pM&feature=emb_logo
Foster Care teens trip to Facebook: https://www.facebook.com/girlscodefun/photos/a.84082578595476/2058687190838990/?type=3&theater
Programming lessons for children from refugee families: https://www.facebook.com/girlscodefun/photos/a.840739399300448/2697438443630525/?type=3&theater
https://www.facebook.com/girlscodefun/photos/a.840739399300448/2697438516963851/?type=3&theater

-**Websites:**

Program with children from refugee families: **https://www.girlscodefun.pl/inne/fundacja-ocalenie/**
Program with foster care children at Roche: **https://www.girlscodefun.pl/inne/serduszko/**
Very Senior Developers: **https://kidscodefun.com/very-senior-developers/**

- Author: Karolina Cikowska, GIRLS CODE FUN

Good practice: TRAINING MODULE FOR GIRLS ON 3D PRINTING
(Project: GIRLS CHAMPIONS IN 3D)

OVERVIEW

#GirlsChampionsin3D is a social innovation project in the field of new technologies. The goal of #GirlsChampionsin3D is to create a more inclusive labor market, especially in the field of technology for girls around the world. 3D modeling and printing as a "girls'" IT field.

WHY *the context, problem or issue that the practice tackled, and the pursued objective(s);*

More women are in education than ever before, but the numbers pursuing STEM subjects are actually falling. Worse still, if less women enter this sector it becomes even harder to seek an equal, diverse workforce throughout science, computing and tech companies. In Romania the situation is even worse. With more women leaving the industry prematurely, it makes having role models at the top increasingly difficult. This further adds to the image of a male-dominated tech world.

Even open companies have gender gaps when it comes to women in ITC. For instance, some 42 percent of LinkedIn's employees are female, but this number drops to 18 percent when only technology jobs are considered. 30 percent of Apple's total workforce are women, but falls to just 20 percent when looking at tech jobs within the company. At Google, 30 percent of its employees are female and this drops to 18 percent for those in tech roles.

We can say that the 3D printing industry is at its beginnings, merely envisioning its full potential. The latest use of 3D printing is for NASA, educational models, helping disabled persons, construction, clothing and footwear, art and so many more.

In developing countries there aren't many 3Ds yet (in Bucharest, for example are just a dozen of them) and there aren't designers that can use the 3D printers at their full potential.

The project proposes to use this momentum, this ground 0, to give a head start to girls in this new, fast developing industry.

WHO *who played the main role(s) (educators, mentors, youth workers, volunteers...);*

The main roles were played by E-Civis Association that communicating to girl students and ECDL Romania that provided the training and certification for the 22 girls students in the field of 3D printing.

to WHOM *the main target(s)*

The main target were girl students from different universities, interested in learning about additive manufacturing and modeling for 3D printing.

WHAT *the main activities implemented and the results achieved*

The course has a duration of 24 hours.
Through this module girl students will know:
– To identify the main 3D printing processes
– To know the main fields in which 3D printing can be applied
– To use a 3D modeling application to create, modify and save objects, the import and export of 3D models
– To process orders for 3D printing
– To know the basic components of a 3D printer
– To use a 3D printer to print a physical object
– To execute physical maintenance and solve mechanical problems at 3D printers based on FDM process (Fused Deposition Modeling)
– To know the basic concepts associated with 3D printing, ethics and intellectual property

WHERE *the learning environment*

The trainings took place at EduHub – a learning place of ECDL Romania.

HOW *the method*

The trainings consisted in a presentation of the modeling software, the tools for modeling and practice, as well as printing of the designed model.

-**Website:** *http://girlschampions.com/en/home/*

-**Key words:**#girlschampions #3Dprint

- **Author:** Ana Maria Stancu, E-Civis

Good practice: the RoboHub

OVERVIEW

The RoboHub is a space hub dedicated to robotics and related domains in Bucharest, but also in the country. RoboHub offers free and subsidized courses for children whose parents cannot afford the cost of a robotic course.

At RoboHub there are also courses of introduction into new technologies related to robotics, such as Machine Learning, artificial intelligence, HoloLens, robotic operating System, but also debates on the impact of new technologies on our society.

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WHY

Technology is becoming omnipresent in our daily lives and most certainly indispensable in future the life of the children as they grow old and prepare to enter the working market. While we consider this to be important for all children, we focused mainly of the ones from vulnerable groups whose parents cannot afford to pay for the robotics or programing classes, thus widening even more the gap between them and those with financial means.

WHO

The activities were carried out mainly by two employed persons, but also through the help of volunteers. The positive part is that by using very intuitive programming platforms we were able to train also, very easily, volunteers with no programming background whatsoever.

to WHOM

Our main target were children that receive social scholarship (low income, with a handicap or orphans) and children with a family income lower than 4000 RON (aprox. 900 USD)

WHAT

We managed to teach over 300 children from vulnerable groups, train at least 10 volunteers and educate almost 100 parents on the importance of new technologies in their children's life

WHERE

RoboHub – a physical space in central Bucharest

HOW

We used Minecraft for Education, Ozbots and Micro:Bits mainly, but also tested with Arduino and OhBot.

-**Other information/resources**

The Girls Summer Camp was organized at RoboHub, for free for girls. The age range was 8 to 12 years old. They learned basic concepts about robotics, programming and also did origami. They worked with Ozobot, Micro:Bit, Lego WeDo and Minecraft for Education.

- **Website**:   http://e-civis.eu/en/alt-future-everyone-digital/
http://e-civis.eu/en/hai-la-robohub-2/

- **Author:** Ana Maria Stancu, E-Civis

Good practice: Coding in rural areas

OVERVIEW

The event "Keeping up with technology - Promoting coding in the rural area" aimed at exposing young students from Mihailesti, Buzau County to coding and robotics. Kids have become familiar with a humanoid robot and a robot spider, but they also learned about visual coding.

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WHY

Technology is causing major societal changes in the world. There are studies that raise awareness about the loss of jobs, but they also underline the fact that new ones will be created. However, in rural areas, where most of the citizens have no digital skills how can one talk of the possibility of new jobs? These citizens are bound to be left behind in this new tech society.

WHO

The trainer was from Bucharest from E-Civis Association, but we had a strong collaboration with the school principal.

to WHOM

school pupils

WHAT

The program consists of coding lessons for school pupils in 2 schools in rural area. They will have a chance to build a modular robot and start programming it.

WHERE

In the 2 schools in Mihailesti

HOW

First, we presented information about what awaits them in the future, how large a role will technology play in our daily lives and the importance of not being only a consumer, but also a creator of technology and to be able to understand it.
After that we presented the Ozobot platform and taught them how to program.

Author: Ana Maria Stancu, E-Civis

Good practice: ONLINE COURSE ON SOCIAL NETWORKING (PROJECT: ITECH)

OVERVIEW

The moodle course on social networking is an interactive and playful resource that enables users to better understand the nature, scope, threats and opportunities related to social networks.

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WHY *the context, problem or issue that the practice tackled, and the pursued objective(s);*

This module aims at equipping its users with the following transferable and versatile digital skills:
- managing digital identity
-knowledge and know-how of behavioral norms in online/virtual interactions
- ability to protect self and others from possible online dangers (e.g. cyber bullying)
- protecting personal data
- interacting through technologies (understand appropriate ways of communicating through digital means, refer to different communication formats, adapt communication modes and strategies to the specific audience)
- engaging in online citizenship
- collaborating through digital channels
-avoid health-risk related with the use of technology in terms of threats to physical and psychological well-being

WHO *who played the main role(s) (educators, mentors, youth workers, volunteers...);*

The training will be led by educators and mentors, as well as youth workers as trainees' tutors. As the module is
comprehensive: it will contain an exhaustive and up to date set of activities on the topic of social networking
self-contained: people in charge of delivering the module won't need to rely on any external resource to deploy it
participative: it will require users to act as a group in order to tackle some of the challenges, it will also involve interaction between facilitators and users
adjustable: facilitators will be able to adjust it based on the needs of their target public, their background knowledge, competences, and skills

to WHOM *the main target(s);*

The Moodle course is mainly for youth aged 11 to 17. However, educators and youth workers may also find it useful to deepen their knowledge of social networking.

WHAT _the main activities implemented and the results achieved_

Users can learn how to communicate online, introduce themselves and manage their own impressions on social networks. Users can also get knowledge about how to create a cause on Facebook and learn about basic rules of netiquette. Users will obtain knowledge as to how to create their CVs and how to use social networks for career development purposes. Also, basic principles of online safety and how to protect own's personal data can be found.
This module tackles the following topics:
- social networks and their opportunities for career, self-development, participating in social activities
- the advantages of social networking
- preventing radicalization on social networks
-preventing social networks from engaging young people in individualistic behaviors that undermine citizenship

WHERE _the learning environment_

The course is hosted in Moodle platform as a learning environment and is accessible from any location at any time.

HOW _the method_

The module is self-paced and does not require physical presence in a traditional classroom. The educators should grant trainees access to the course and the platform. Then they could pass it with their own pace depending on their knowledge, skills and preferences.

Other information/resources:
The module is registered at Salto-youth

Website: https://www.salto-youth.net/tools/toolbox/tool/moodle-course-on-social-networking.2415/

- Author: Veselina Jecheva, BURGAS FREE UNIVERSITY

Good practice: the E-textile bag
(Project: ITECH)

OVERVIEW

The e-textile bag is a regular cloth bag,equipped with specific components sewn into with purpose to serve as an educational tool for children and youth workers to learn electronics, circuitry and visual programming.

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WHY

To improve youngsters' digital literacy, and acquire 21st century skills such as creativity and innovation, collaboration and communication skills, critical thinking and problem-solving skills.
This practice aims to equip its users with the following portable and versatile digital skills:
- creating skills for working with electronic devices;
- introduction to different types of electronic elements;
- what is a "microcontroller" and how it works;
- how to connect the microcontroller with a system sensor;
- to prepare the programming hardware;
- elements of creating a software program;
- acquisition of digital skills and other.

WHO

The product is meant for youth workers to easily showcase microcontroller boards, circuitry, electronic hardware and coding to their students. The training is guided by teachers and mentors as well as youth workers as trainers.
- the lessons are prepared by teachers and students in all aspects;
- young mentors are trained in the process, trained to demonstrate the necessary elements for students to absorb;
- other teachersor mentors participate in the training process on a voluntary basis in order to reach greater number of trainees.

To WHOM

Youth practitioners/educators/digital animators willing to launch educational activities on digital science, targeting young people aged 9 to 17 years old.
Applications are developed for children with interest in digital technology who don't have or have basic knowledge in the field.

WHAT

The e-textile bag is built using an Arduino Leonardo/Uno microcontroller board and various electronic components such as LED, light sensor, speaker, vibration motor.The bag has detachable textile patches and the electronic components (LED, light sensor, etc.) are embedded into it. There is an Arduino Leonardo/Uno board featured which connects to the patches / components with jumper wires.Thus, you can teach young students in circuitry and programming by using a common object (the bag) as a platform to organize the circuits.

This module tackles the following topics:

- To learn how to set up the e-textile bag to create a smart object that reacts to the amount of light recorded by an ambient light sensor;
- To learn to use Arduino IDE to code and upload the firmware onto your Arduino Leonardo board;
- To program the Arduino board so that the ambient light sensor interacts with the LED.
- Will learn how to make sounds with a piezo speaker mounted on the e-textile bag.
- How to create a simple code to have your piezo speaker patch play some notes on mBlock or Scratch software;
- How to solve some problems when you try to connect your Arduino Leonardo to mBlock and how use Arduino IDE to code and upload the firmware onto your Arduino Leonardo board;
- and many others.

WHERE

- the training is carried out in a study hall at a planned place and duration;
- required with appropriate electronic components, microcontrollers and pre-installed software related to the hardware;
-training is attended by the presence of trainees.

HOW

Tutorial: [*https://wikifab.org/wiki/Electronic_textile_bag/en*](https://wikifab.org/wiki/Electronic_textile_bag/en)

- trainers must provide trainees with access to computers and the necessary hardware;
- the training is done as each trainee has his own working set of microprocessors, the necessary electronic components and elements, a computer with software installed on it;
- training is provided through multimedia presentations, use of interactive training tools, interactive whiteboards and other accessible tools.

Other information/resources:

- presentation techniques such as a multimedia projector, interactive whiteboard or similar are required for the training;
-no special resources such as Internet, network, social media, etc. are needed.

Website:https://spark.adobe.com/page/aHIXEBhlkBOJS/

Author: Veselina Jecheva, BURGAS FREE UNIVERSITY

Good practice: Connected objects with ESP32 (IoT)
(Project: ITECH)

OVERVIEW

ESP32 is a programmable board with integrated wi-fi module, which can therefore connect to the internet. It allows to interact with online platforms such as Adafruit.io, and, for example, send real-time values recorded by the board (temperature, ambient light, etc.) online.This module tackles the following topics:

- The OER modules on Internet of Things (IoT) - about connected electronic interactive objects which enable people to monitor the environment, record data about it, interact at distance with people and things.

- Some advanced examples were prepared for the advanced group. In addition to the wooden toy that responds to touch, presentations also included examples of how we can make ourselves something of the IoT family.

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WHY

To improve youth digital literacy, and acquire 21st century skills such as creativity and innovation, collaboration and communication skills, critical thinking and problem-solving skills like:

- the examples demonstrated the sending of information collected from different sensors - temperature sensor, touch sensor, light detector, pressure sensor, humidity sensor, etc. to a database on the Internet, data processing and message sending on SMS Messenger orFaceBook;

- to demonstrate how we can manage these processes over the Internet by demonstrating methods of controlling IoT with HTML;

- to show various examples how to program and use real multitasking and how to monitor and manage different processes in real time using virtual multitasking;

- to create a Smart House, an example of a mini weather station, and how to manage it over the Internet, as well as create elementary games with Internet access;

- a demonstration of game running in parallel with a Mini Meteorological Station on a Web Server released on the ESP32 controller with internet access provided;

- the way to communicate with the network, embed a web page into the controller, use it as a WEB server and as an Access Point were also demonstrated and discussed in the presentation process;

-and others.

WHO

The product is meant for youth workers to easily showcase microcontroller boards, circuitry, electronic hardware and coding to their students.

- the lessons are prepared by teachers and students in all aspects;

- young mentors are trained in the process of demonstrating the necessary elements for students;

-other teachers, mentors or mentors participate in the training process on a voluntary basis in order to reach a greater number of trainees.

to <u>WHOM</u>

Youth practitioners/educators/digital animators willing to launch educational activities on digital science, targeting young people aged 9 to 17 years old (children and students from specialized schools), who have good or advanced digital skills.

<u>WHAT</u>

The first item is a connected pet (a miniature sheep) capable of connecting to social networks, for example Facebook.

The second item is a connected miniature house, capable of connecting to Adafruit.io and sending real-time values gathered by sensors (for example temperature sensor or light sensor).

You can teach circuitry and programming to young students by using a common object (a wooden house / pet) as a platform to organize the circuits.

Other OER modules developed for training:

- Smart house publishes sensor data on-line on adafruit.io;

- Smart house publishes values of the amount of light and temperature on adafruit.io;

- Smart house sending messages to Facebook messenger upon critical situations (light level, temperature level, humidity level, force of pressure and other) using adafruit.io database and IFTTT triggers;

- Mini weather station example with ESP32, using web page and web server mode;

- ESP32 in single tasking and real multitasking for event processing;

- ESP32 in virtual multitasking for one core and event processing;

- ESP32 in virtual multitasking for two cores for separated event handling and web server operation;

- ESP32 and access point, working on ESP32. Data transfer example;

- Playing games on ESP32. Game "snake" example;

- Multipage web server and access point example. Mini weather station and game playing on web server and access point built into the module ESP32;

- Wooden pet sending messages to Facebook messenger upon interaction;

- and others.

<u>WHERE</u>

- the training is carried out in a study hall at a planned place and duration;

- Required with appropriate electronic components, microcontrollers and pre-installed software related to the hardware;

- training is attended by the presence of trainees.

- the training is provided by a teacher or mentor.

<u>**HOW**</u>

Tutorials:

Wooden pet *https://www.instructables.com/id/Wooden-Pet-Connects-to-Facebook/*

Energy Saving House *https://www.instructables.com/id/Energy-Saving-House-With-ESP32/*

- trainers must provide trainees with access to computers and the necessary hardware;

- the training is done as each trainee has his own working set of microprocessors, the necessary electronic components and elements, a computer with software installed on it;

-training is provided through multimedia presentations, use of interactive training tools, interactive whiteboards and other accessible tools.

-**Other information/resources**

- presentation techniques such as a multimedia projector, interactive whiteboard or similar are required for the training;

- additional resources such as the Internet, an available WIFI LAN, access and registration to social media such as Facebook, cloud services, etc. are needed.

-some training requires registration in specific cloud resources.

- Website:

https://spark.adobe.com/page/upQQAQvpCBebn/

Author: Veselina Jecheva, BURGAS FREE UNIVERSITY

www.gitecproject.eu