Neurotech^{EU}

The European University of Brain and Technology

[D7.4]

[Dissemination content for STEM fields, 2]

Deliverable information	
Work package number	D7.4
Deliverable number in work package	WP7
Lead beneficiary	UMF
Due date	31-10-2023

Document History		
Version	*Description*	*Date*
1.0	Dissemination content for STEM fields in schools Neurotech^{EU}	October 2023
1.1	Dissemination content for STEM fields in schools Neurotech^{EU} – Final version	October 2023

EXECUTIVE SUMMARY

Middle and high-school years are informative times as students begin to identify their interests, which will often be the focus of their studies at the university. Despite the changes in student demography in STEM fields, young girls in middle school and young women at university still constitute a minority within these programmes. To promote STEM among all students, NeurotechEU plans to disseminate the Alliance's offer via student events (ESU, BrainBee competitions), as part of *WP7 Widening access: Diversity, multilingualism, and multiculturalism*.

In this context, the present deliverable outlines more examples of content and methodologies that may be used for promoting STEM education in schools, especially among underrepresented groups in STEM fields. The material will be made freely available via the NeurotechEU web portal. This is a living document that will be populated with relevant material from consortium partners.

1. Girls Who Code

Girls Who Code aims to reduce the gender gap in technology and to change the image of what a programmer looks like and does. Girls Who Code values diversity, equity and inclusion as essential to its mission. The organization is focused not only on gender diversity but also on young women who are historically underrepresented within computer science fields. More than 580,000 girls benefited from in-person programming and educational content. Over half of the girls were from historically underrepresented groups.
Locations: US, UK, Canada, and India.
Materials
- Trinket Editor
- Starter Trinket Code
- Example Chatbot Project
- Optional: Planning Guide
- Optional: Pen/Pencil/Markers

Programs Code at Home.
Programs offered online, offline, and with varying levels of difficulty. Each activity features a woman in tech who has pioneered an innovative technology.

Stand out for Mother Nature.
Around the world we take time on April 22 to celebrate Earth Day and to reflect on the beauty and wonder of our planet. After consulting with over 190 countries, the Earth Day Network declared that the theme for Earth Day 2021 was "Restore Our Earth". With this focus, scientists, businesses and governments look towards future technologies that can restore our ecosystems, wildlife populations and oceans around the globe.
In this activity, we stand up for mother nature by creating a Public Service Announcement, or PSA, to teach others about an environmental issue and provide potential solutions as part of the

#RestoreOurEarth campaign. You learn how to plan and program a PSA for your selected audience with Scratch, and consider what makes a PSA impactful.

Python Activities

Learning basic computer science programming concepts with one of the most popular text-based languages, Python. This is used by programmers for websites, data analytics, finance and machine learning. Learn how to create a chatbot, how to depict data using various types of graphs, or to draw information from a dataset to observe possible trends.

Meteor Catcher Game Series.

Learn how to program your own game using p5.js, a JavaScript library created, especially for artists and designers. Each download includes the activity and a reference guide.

Girls who Code. Project Gallery.

> A list with projects created by girls can be accessed at the following link:
> https://hq.girlswhocode.com/project-gallery?

2. Create and Learn

Best for: 2nd-12th grade.

Purpose: Learn coding, AI, robotics, and more with virtual small-group classes led by live instructors.

Create and Learn is an online STEM program designed just for kids. It offers live, small group classes or 1:1 tutoring options in a variety of coding and robotics fields. Your child can learn Scratch or Python — or even try creating their own Roblox mini-game.

This program caters to all levels, with classes designed for beginner, intermediate and more advanced coders. Before signing up and choosing a paid learning path, sign up for one of the program's free classes to see if it's a good fit for your child.

3. Code.org

Best for: K-12th grade.

Diversity is often lacking in computer science workplaces, but organizations like Code.org are looking to change that. This free program offers online courses and activities for home and school use, helping underrepresented populations, including girls, get a strong start in STEM.

Find a full lineup of coding activities — from mini, one-hour lessons to full courses covering all the basics of computer science. Explore the website to see its complete catalog of courses, designed to get kids learning.

Code.org increases diversity in computer science by reaching students of all backgrounds where they are — at their skill-level, in their schools, and in ways that inspire them to keep learning. The vast majority of the students on Code.org are from student groups historically underrepresented in computer science. Increasing diversity in computer science is foundational to the organization's efforts to close the representation gap. Here you can read more about their efforts.

4. BOTSTEM

Part of roBOTics and STEM education for children, the BOTSTEM project is co-funded by the European Erasmus+ Progrsam of the European Union (KA201 Project n°2017-1-ES01-KA201-038204).

Although STEM programs increase rapidly, these are focused on high schools and after-school activities. While these approaches are being considered by policy makers, still remains a lack of research in this field and its adaptation to Childhood and Primary Education. These stages are a crucial period for enhancing future careers and changing the societal misconceptions and prejudices against science and technology.

The objective of BOTSTEM is to develop new tools by means of inquiry teaching, open robotics and code-learning for enhancing current didactics of STEM subjects. BOTSTEM is aimed and fully in-line with the formal education curricula and its purposes for childhood and primary schools.

Specifically, BOTSTEM aims at:
- improving the acquisition and competencies and, thus, potential students' achievement in STEM, particularly in Natural Sciences and Maths, through innovative methodologies and resources, open source software/hardware, inquiry-based projects and code languages (IOs)
- developing tools more appealing for pupils (educational games, open robots, playable code-learning and suitable methods for implementing them)
- enhancing the quality and integration of Long-life training aimed at teachers through VLEs which allow a peer-learning more flexible and cost-effective optimising the public image and perception of Science and Technology, overcoming the prejudices that kids assume in their early childhood leading an early intervention in STEM integrated with a gender-based approach.