Erasmus+ KA1 Course

STEAM Education

Creating a Fun Learning Environment Oriented in Reality

ErasmusLearn Training Center
www.erasmuslearn.eu
Heraklion, Crete, Greece
Organisation ID: E10020547

Summary

STEAM (Science, Technology, Engineering, Art, and Math) is an educational framework that brings reality into the classroom by connecting different subjects together in a way that they will relate to both the real and the business world and to each other as well. STEAM is the second step of STEM education, in which one incorporates the artistic and design-related skills and thinking processes to student-learning process. As such, STEAM education is gender inclusive and accessible for all levels of technical abilities. STEAM education provides an opportunity to formally teach in a fun environment, showing the relationships between subjects and real-life, therefore increasing the sense of motivation, self-efficacy, and problem-solving skills. It aims to promote the learners' motivation for learning and to educate people in order to help them become capable of solving multidisciplinary problems.

In addition, STEAM education is to play an important role when proposing solutions to overcome the well-researched and identified gender issues pronounced in many Western societies related to involving, motivate and retaining girls and women in the fields of science, technology, and math, including socio-cultural expectations, lack of female role models, relevancy of curricula, pedagogy, and so forth. Furthermore, the inclusion of the arts in the hard sciences curricula intends to foster creativity and economic growth.

Purpose

The main purpose of the course is to help teachers understand the importance of STEAM education and improve their science school lessons and science projects in kindergarten and in primary school, and also in the first grades of secondary school. Participants will be familiarized with the impact they can have on children by learning science in a fun and innovative, yet educational way. They will learn how to boost children's imagination and natural gift of questioning by implementing scientific ways of thinking and scientific methodology in their work. Our goal is also to help children find ways to make STEAM education a fun pathway to children's school life, but also a precious tool in their educational path and life.

Objectives

- Learn why STEAM education is important for literacy matters.
- Discover the advantages of creating a fun learning environment in teaching Science.
- Explore how children, and especially girls, can benefit from the incorporation of Art in STEM education.
- Discover the importance of reality in STEAM Education.
- Learn how to teach children to develop a scientific mind and attitude.
- Determine the skills of scientific enquiry processes.
- Learn the educational benefits of self-explanation.
- Discover creative, low-cost science experiments in class.
- Discover the usefulness of Arduino in STEAM education.
- Discover ways to integrate Art in STEAM education.
- Discover ways to involve reality in STEAM education.
- Motivating more girls to participate in the field of science.

Course Language

- English.
- Note: Participants must have at least a CEFR level B2 knowledge of English in order to be able to participate actively.

Target Groups

Teachers: primary, secondary,vocational, adult, special needs - Teacher trainers - Head teachers -Principals -Managers of schools.

Methods & Tools

Lectures, exercises, discussions, teamwork, role-playing, study visits.

Course Agenda

Day 1

- Introductory meeting, explanation of practical arrangements.
- Presentation of timetable.
- Presentations of participating Organizations.
- Icebreakers, Introduction to the Course.

Day 2

- Developing children's ability to learn how to learn.
- Teaching children to develop a scientific mind and attitude.
- The importance of creative thinking.
- The scientific method through a simple experiment.
- Introduction to AI: Fuzzy logic.
- Using basic machine learning to address s challenges

Day 3

- The use of Art in Steam Education (Lecture and Workshop).
- Creating our first e-book.
- Creative writing in the classroom:
  -Science haikus and tweet stories.
  -Fun with maths.
  -Introduction to 3D design
  -Music and the fruit piano.
- Cultural Activities: Guided tour to the Historical Center of Heraklion.
- Dinner in a traditional restaurant of the town.

Day 4

Guided tour at the Museum of Ancient Greek Technology:
"Ancient Greece – the origin of Technologies"

The Hi-Tech inventions then and now. Visitors have the chance to meet over 70 fully functional reconstructions of ancient Greek inventions, accompanied by rich audio-visual material, from the robot – servant of Philon to the cinema of Heron and from the automatic clock of Ktesibios to the analog computer of Antikythera.

Day 5

- Introduction to the use of microcontrollers (Arduino or Micro:bit) in science education
- Problem based development of projects.
- Block programming in virtual enviroment.
- Building and testing the real circuits.
- Creating virtual games in science
- A simple escape room

Day 6

- Field visit to witness the envirnonmental challenges
- Science on the Beach:
  -Low cost experiments
- "Adopt a tree":
  -How climate change affects the most valuable natural resource
- Creating time-lapse videos.
- An ecosystem in a bottle
- Introduction in science gamification

Day 7

- Erasmus+ program : objectives, priorities, actions, forms, budget, tips for applicants.
- Planning follow up activities, dissemination and exploitation of learning outcomes.
- Course Evaluation.
- Certifications.

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