TRAIN THE TRAINERS

STEAM BOOSS

boosting soft skills

2023-1-IT01-KA220-VET-000163992

Introduction

1) STEAM BO.SS
2) The purpose of the event
3) What will you gain?

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Introduction to STEAM Approach

STEAM → Science, Technology, Engineering, Arts, and Mathematics

New transdisciplinary perspective

Integrates the humanities approach into the classic STEM approach

The arts integrate with traditional disciplines to enhance creative aspects and go beyond the boundaries of the classic STEM approach

The STEAM method was created to respond to labor market needs

The introduction of the arts represents a step forward in promoting a broader and more creative vision in problem-solving

The STEAM approach finds applications not only in the educational context but also in business, artistic, and technological fields.

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What is the STEAM Approach?

The arts stimulate lateral and creative thinking, supporting the development of innovative solutions

By involving the arts, inclusivity and understanding of different cultural perspectives are encouraged

The arts contribute to making the learning process more interactive and engaging, enhancing the experiential aspect

Encouraging divergent thinking alongside standard convergent thinking

Creativity improves:

- Stress management and increased self-efficacy
- Social skills (communication, teamwork, trust among team members, autonomy, engagement)
- Satisfaction and retention

In addition to vertical knowledge, students develop skills in negotiation and problem-solving

Activities such as documentation, drawing, and even physical activity are encouraged

Students play an active and important role in the learning process

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A in STEAM

Integrating the Arts into STEM goes beyond adding decorations or superficial elements. It requires deep and meaningful integration

This approach enriches the learning experience and develops crucial cross-disciplinary skills, such as the ability to communicate complex ideas in a visual and engaging way.

Stimulating Creativity → The Arts provide a means to explore and experiment with different forms of expression, fostering creativity and innovation that are essential in the modern world.

Practical Examples and Applications in Teaching

Community Technology Garden

- Science: Botanical knowledge
- Technology: Sensors and monitoring systems
- Engineering: Automated irrigation systems
- Art: Study of aesthetic and emotional impact
- Mathematics: Growth data analysis

Community Engagement: Participation of schools and residents

Involvement of all disciplines and local stakeholders to create a sustainable and integrated garden, with a holistic and inclusive approach.

Understanding Creativity:

- Collaborative Nature: Creativity thrives in social contexts, emphasizing collaboration over isolation.

Conditions for Flourishing Creativity:

- For Individuals: Access to learning and intrinsic motivation.
- For Domains: Flexibility and openness to innovation.
- For Fields: Cultural recognition and support for novel contributions.

Creativity is a collective process influenced by personal passion, domain expertise, and social validation.

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Trainers' Perspective

Trainers come from diverse disciplines

The success of activities depends on the enthusiasm and engagement of the trainers

Trainers assist in problem modeling by encouraging reflection, communication, autonomy, and self-efficacy

Trainers help students see problems as opportunities to be solved creatively and collaboratively as a team

trainers must **overcome disciplinary barriers** and collaborate with colleagues from different sectors to ensure the effectiveness of the transdisciplinary approach.

Continuous training for trainers becomes crucial to correctly apply the STEAM method and stay updated on educational innovations.

Teaching according to the STEAM approach requires greater flexibility and the ability to **adapt lessons to** the needs of **students** and the context.

Steps for designing and testing

1. Identification of Learning Objectives
2. Selection of a Relevant Theme or Problem
3. Planning for Interdisciplinary Integration
4. Detailed Development of the Activity
5. Piloting and Refinement Based on Student Feedback

Continuous Monitoring of Progress

Gathering Feedback and Challenges Faced

Collaboration in Learning and Additional Feedback

Adaptation of Future Activities Based on Experience

Students' Perspective

The STEAM approach fosters the development of a growth mindset, where mistakes are seen as learning opportunities.

It increases students' autonomy, enabling them to manage their own learning process independently.

It enhances multitasking skills and the ability to adapt to variable and complex contexts, better preparing them for future work life.

Students are encouraged to:

- solve their own problems
- build communities (even outside the classroom)
- be open-minded
- trust one another and manage conflicts
- value diverse knowledge within student teams

Self-reflection is also an important part of the learning process

Example of a STEAM Activity

Educational Initiative → Design and Creation of a Smart Pot

Target Audience → Students aged 14 to 18

Objectives → Integrate technology, sustainability, and creativity

Project description

What will we do?

- Creation of a smart pot with advanced sensors and recycled materials
- Monitoring of air pollution, humidity, temperature, pH, and water level
- Interaction through an LCD display with various animations

Learning Objectives

- ➔ Learn to design and build an integrated system using sensors and microcontrollers.
- ➔ Apply concepts of automation and environmental sensing.
- ➔ Explore the interconnection with issues of air pollution and urban ecosystems.
- ➔ Work in groups to solve problems and prepare a final presentation of their work.

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Activity Details

Day 1 - Design of the Smart Pot Students will explore the importance of sustainability and automation in plant care. The design of the pot layout and the selection of sensor placement will be crucial for ensuring a functional and effective system.	Day 2 - Assembly of Components Students will address the details of how the sensors and microcontroller work. Activities involving the connection and configuration of the sensors. Creation of an intuitive display system to show the detected information.	Day 3 - Microcontroller Programming Writing the code needed to detect and display data from the sensors on the LCD. Implementing animations for the pot's emotions in response to the collected data. Crucial phase for effective communication with users.
Day 4 - Study and Programming of Emotions Exploration of human-machine interaction in the context of the smart pot. Students will develop and implement animations on the LCD display that express environmental conditions and plant well-being. Objective: increase user engagement.	Day 5 - Optimization and Presentation In the final phase, students will reflect on the overall effectiveness of the smart pot. Optimization of the integrated system based on the feedback received. Preparation of a project presentation.	

DISCUSSION

Where have you used the STEAM approach in your work?

How can these practices be adapted in different educational contexts?

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Conclusions

STEAM for Students → enhances critical thinking, communication, creativity, and collaboration in addition to vertical knowledge
Prepares students for real-world challenges
Promotes continuous improvement of self-efficacy

STEAM for Trainers → a transdisciplinary approach to enhance, among other things, the importance of communication and collaboration

The STEAM approach is increasingly expanding in schools and universities around the world, also influencing educational policies.

It is expected that the method will continue to evolve, integrating new technologies such as artificial intelligence, robotics, and virtual reality.

STEAM is destined to become a reference model not only for education but also for continuous training and lifelong learning in professional contexts.

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SOFT SKILLS

PROACTIVITY

CONFLICT MANAGEMENT

TIME MANAGEMENT

FLEXIBILITY

PROBLEM SOLVING

DECISION MAKING

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CRISIS MANAGEMENT SIMULATION GAME

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BREAK - 15 minutes

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Designing a mini project for enhancing students' soft skills using the STEAM approach

40 minutes

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PRESENTATION OF THE PROJECTS

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How are you going to implement the training in your work/teaching?

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1) Community of Practice: QR
2) MOOC: QR

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QUESTIONNAIRE

https://docs.google.com/forms/d/e/1FAIpQLSe0slrouQKggevbKSt64yTjU6rDw1trS9HSrYY4jJBnwmthxQ/viewform

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CERTIFICATE OF ATTENDANCE

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THE BOOST THAT MAKES THE DIFFERENCE

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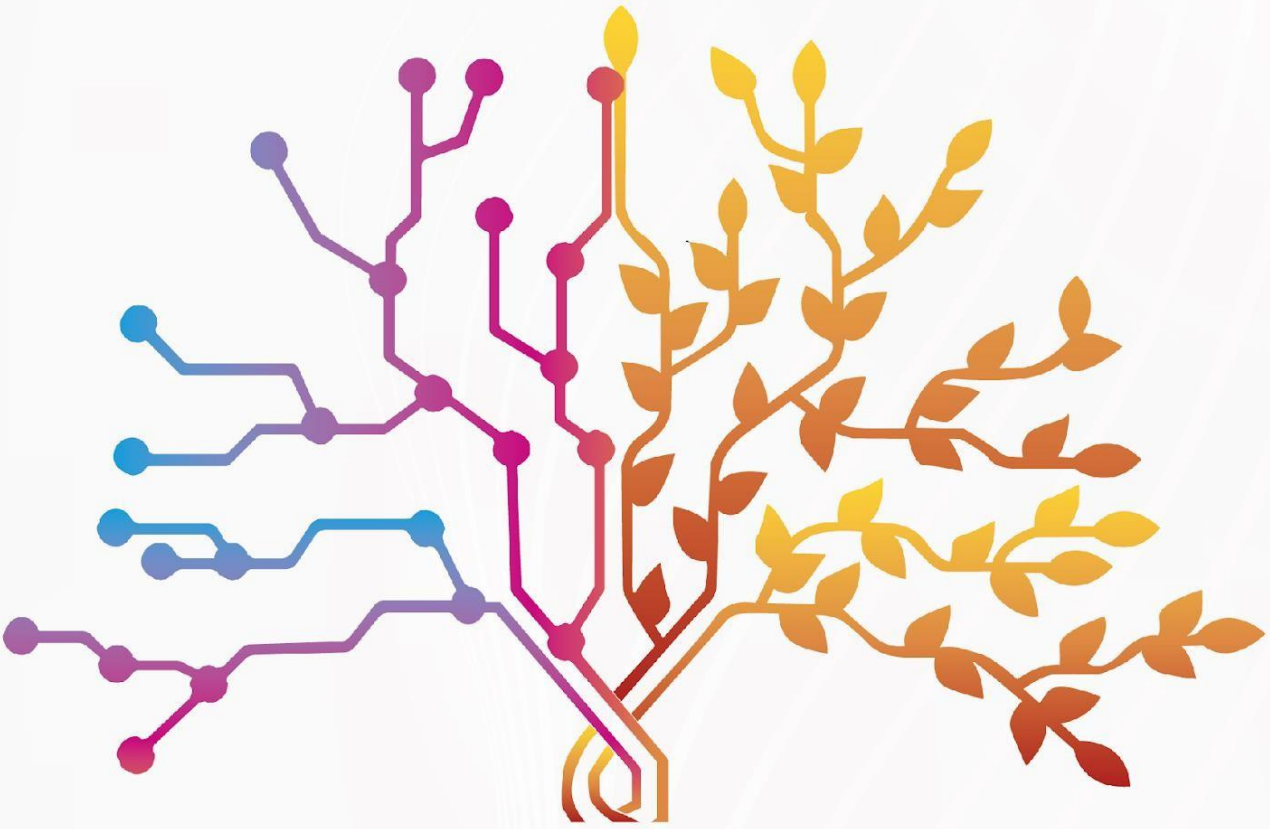

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Detailed programme_Train the Trainer

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1	**Introduction** **10 inutes**	WELCOME EVERYONE Introducing **the STEAM BO.SS** 1) **Intro to the STEAM Bo.SS** In a world where the landscape of work is ever-evolving, shaped by continual crises and technological advancements, the need for adaptable skills has never been more critical. Over the past 25 years, the discourse around life skills has expanded to encompass the significance of transversal or soft skills. These skills not only facilitate entry and sustainability in the job market but also distinguish individuals amidst competition. They serve as a compass navigating through the disruptions brought forth by technological shifts in work paradigms. However, the development of these skills isn't an individual endeavour nor are they inherent traits. Rather, they require nurturing within a supportive and non-judgmental training environment. This realisation underpins our project, which seeks to cultivate these essential soft skills through activities grounded in the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach. the event, objectives, and trainers and their expertise 2) Overview of the **event's** purpose: Sharing skills and knowledge gained at the training camp. Presenting the STEAM approach and the soft skills. 3) What will the participants gain? ○ An overview of how to implement the STEAM approach while focusing on soft skills. ○ Some new tips and useful practical ideas to use in everyday teaching ○ Sharing method with fellow teachers. ○ Practice in the STEAM approach ○ Opportunity to join an international web in Community of Practice ○ A link to MOOC for more in depth outline of the approach
2	**STEAM Approach overview** **30 minutes**	1) QUESTION to the group - What do the participants know about the STEAM approach, what does it mean for them? **2 minutes discussion + quick feedback** 2) Our overview of the STEAM approach (Slides) 3) DISCUSSION in groups – Where have they used the STEAM approach in their work? Discussion on how these practices can be adapted and disseminated in different educational contexts.

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3	**SOFT SKILLS 20 minutes (PRINT THE POSTERS AND THE SIMULATION CARDS)**	1) Overview of the soft skills – Why these soft skills, why are they important? They were the ones chosen as most important by the companies. (Showing the copies of the posters to exemplify) 2) In groups tackling three station activity – Each group can get one task or different tasks with different soft skills focus?
BREAK 15 minutes		
4	**GROUP WORK 40 minutes (PRINT THE CHALLENGE)**	Designing a mini project for enhancing students' soft skills using the STEAM approach (40 min) ○ Mini-hackathon design project? Something that can be tackled in a shorter time
5	**PRESENTATION 20 minutes**	Groups present their projects and give feedback on how the collaboration went + STEAM approach implementation
6	**Reflection and Feedback 15 minutes**	1) Having participated, how are they going to implement the training in the respective countries. 2) Information on how to access additional resources and support networks. CoP, MOOC

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STEAM Challenge

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Hackathon: Quick Concepts for Recycling Awareness

Activity Description: A waste management company recently conducted a recycling awareness campaign that unfortunately did not achieve the desired results. To reenergize public interest in recycling, the company has decided to tap into the creativity of high school students through a workshop.

This innovative challenge is open to all secondary schools in the region, where students, organized into small, multidisciplinary teams, will brainstorm practical ideas for motivating people to recycle more effectively. The objective is to propose feasible, engaging approaches to improve waste sorting, raise environmental awareness, and educate the public on sustainable waste management practices.

The initiative will take place in a single, intensive session:

- A one-day hackathon where groups of students will work with selected teachers and a few industry mentors to brainstorm solutions.
- At the end of the session, each team will present a brief outline of their ideas, with the most innovative concepts highlighted by the company for potential future development.

Project Constraints:

- **Participants:** Multidisciplinary teams composed of students from secondary schools.
- **Activity Duration:**
  - **Phase 1:** Students will attend a single, four-hour preparation workshop in each participating school one week before the hackathon.
  - **Phase 2:** A one-day regional hackathon, 6 hours total.
- **Budget:** The company will allocate a budget of €2,500 per school for the preparatory workshop. For the one-day hackathon event, a budget of €30,000 will cover venue rental, materials, and refreshments.
- **Location:** Each school will host the workshop in-house, and the final hackathon will be held at a central community center accessible to all participating schools.

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