CRITICAL MAKING: FOSTERING CREATIVITY, CRITICAL THINKING AND MAKING IN STEM EDUCATION

DESCRIPTION

"Critical Making" is a professional development course for upper secondary STEM teachers, designed to explore the intersection of creativity, hands-on making, and critical thinking. Rooted in the Creative Learning approach developed at the MIT Media Lab, the training invites educators to engage in meaningful projects that foster inquiry, experimentation, and reflection. Participants engage in the Creative Learning Spiral (Imagine → Create → Play → Share → Reflect) and are supported in co-creating a Critical Making classroom activity to explore together with their students.

LEARNING OBJECTIVES

- Foster critical thinking, creativity, and digital literacy in teaching practice.
- Promote inquiry-based and project-based learning.
- Empower teachers to design learning experiences that integrate making and critical reflection.
- Enable teachers to develop classroom activities that stimulate student curiosity.
- Cultivate a peer-learning playful environment centered on experimentation, exploration and iterative creation.
- Explore the Creative Learning approach as a framework for meaningful, student-centered education.
- Design and recreate a learning experience inspired by the principles of Creative Learning.

COMPETENCES DEVELOPED (DigCompEdu)

- Facilitating collaborative learning
- Fostering active engagement
- Identifying pedagogical and technological needs
- Promoting digital competence and critical media literacy
- Creating and modifying digital content

TOOLS AND METHODOLOGIES

- Scratch, micro:bit, LEGO Spike, Arduino, sensors
- Creative digital production: 3D design, 3D printer, TinkerCAD, Fusion360
- AI tools: Generative AI, Teachable Machine, Scratch with AI
- Educational frameworks: Creative Learning, Inquiry-Based Science Education (IBSE), Design-Based Research

APPROACH

The course builds on the 4Ps of Creative Learning: Projects, Passion, Peers, and Play. Teachers explore inspirational projects and prototype their own ideas using a range of accessible and scalable technologies. A low-floor/high-ceiling/wide-walls philosophy ensures activities are inclusive and adaptable. Facilitators act as guides, co-exploring ideas alongside participants. Reflection is supported through learning journals and logbooks, emphasizing metacognition and long-term transfer to classroom practice.
The micro-community and relationships (the "sense of care") that form during this exploratory journey are essential ingredients for learning. Facilitators play a key role in cultivating this inclusive and playful learning environment.

PARTICIPANTS REQUIREMENTS

- B1 English level required
- Personal computer

PROGRAMME

Day 1: Exploratory Making & Shared Definitions

- Free exploration in the makerspace to experiment basic making skills
- Collaborative definition of "Critical" and "Making"
- Introduction to the CMI Framework (Critical, Making, Informative)
- Use of logbooks for documentation and reflection

Day 2: A Project You Care About

- Participants define a personally meaningful project
- Initial prototyping with access to all tools and materials
- Peer exchanges and inspiration from the makerspace
- Continued use of the logbook for tracking insights and progress

Day 3: Transforming Ideas into Learning Activities

- Refinement of participants' projects
- Creation of a learning activity to bring to the classroom
- Final sharing session and peer feedback
- Reflection through the logbook and group discussion

LOCATION

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INFORMATION

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