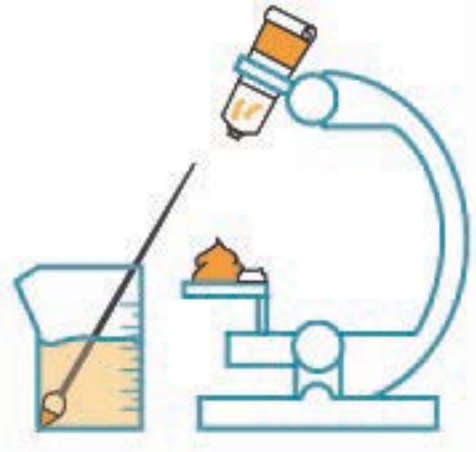
Competence development of STE(A)M educators through online tools and communities

*

achievements in 2020

Prof. Achilles Kameas

Project coordinator



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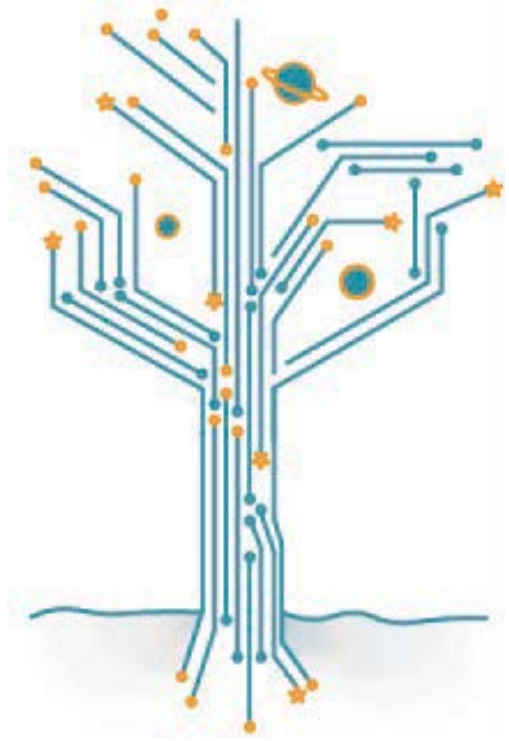
Target groups

- Teachers and trainers, who are interested in practicing STE(A)M education
- Education and training organizations
- Researchers in educational methods and techniques
- Educational authorities and policy makers
- Other stakeholders (e.g. career consultants)



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Aspect 1: community

- Teachers and educators are given a central role as members of an online community
  - An online platform has been developed to serve as the focal point of the community
  - Community members are supported to collaboratively design, create and share educational scenarios
  - Using a crowdsourcing approach, STE(A)M education best practices and policies are being collected and used to inspire and stimulate innovation

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Aspect 2: mapping

- Identification of the roles and competences involved in applying STE(A)M as an educational practice
  - The STE(A)M competence framework details the competences necessary for implementing STE(A)M education policy and practice
  - The STE(A)M educator profile is described as a combination of framework competences
  - A STE(A)M-readiness self-assessment tool allows education and training organizations to assess their capacity in offering STE(A)M education

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Aspect 3: professional development

- Professional development of teachers and educators
  - The project designs a blended training course to be delivered via the online platform and use OERs
  - The course includes a MOOC based on the profile of STE(A)M educator, supplemented by online and classroom activities
  - Online activities result in the collaborative development of STE(A)M learning activity templates and projects, the specification of STE(A)M education courses and the design of STE(A)M education policies

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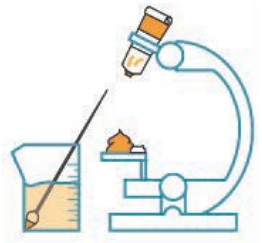
Important outcomes

- Competence-based tools
  - STE(A)M competence framework (based on DigComp for Edu)
  - STE(A)M educator profile (based on ESCO)
  - STE(A)M readiness SAT (based on SELFIE)
- Integrated STE(A)M education framework
  - STE(A)M educators community
  - Online collaborative platform
  - Online content including instructional methodologies, body of knowledge, learning activity, project and course templates, OERs and assessment procedures
  - Blended course including a MOOC based on the profile of STE(A)M educator, supplemented by online and classroom activities
- Policy instruments
  - Guide of STE(A)M educational practices and policies
  - STE(A)M policy influencer toolkit



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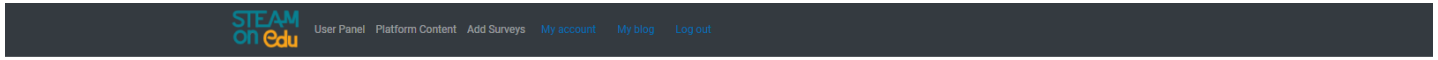
Online community and platform



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- View News & Events
- My Content
- Educational Practices
- Educational Policies
- Repository
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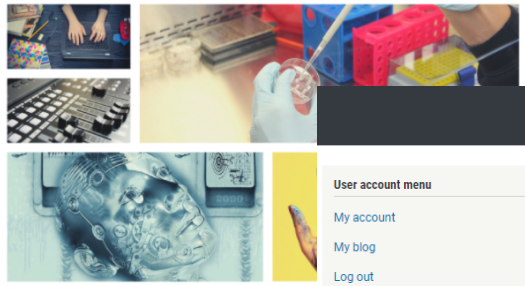
- Forums
- Members
- Search

Partner Tools
- Add News/Events
- Export Practices

Welcome to STEAM on Edu Platform

The **STEAMonEdu project** aims to increase the adoption and impact of STE(A)M education by investing in the community of stakeholders and the professional development of educators.

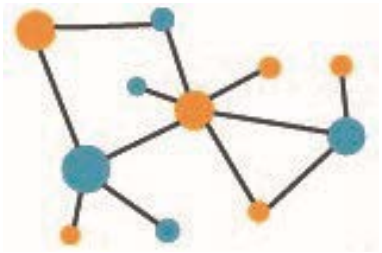


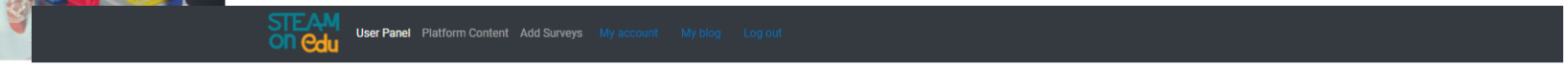
The approach of the project is to nominate educators as the pillars of implementation of STEAM education policies
in a community of stakeholders. The exchange of experience, collaboration and creative work of this community will

As a result of research and creative techniques that will be instrumental among the members of the community, t
methodologies, educational objects, etc.

These findings will be used to design the training curriculum for STEAM educators and the **MOOC "Professional**
MOOC will be available to everyone interested in the topic, and 500 people are expected to enroll. Then 50 MOOC g
lead to production of learning activities templates, STEAM education projects and policies.

1547 views





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Activities of the Länder to strengthen mathematical, scientific and technical education	Educational Policy	Katrin_Schuberth	Sat, 18/07/2020 - 16:23
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The Catapult Challenge	Educational Practice	CamTim	Thu, 09/07/2020 - 14:01
Elements in briefs	Educational Policy	MARTA VENTURELLA	Thu, 09/07/2020 - 13:18
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Learn how to code with "Minecraft: Education Edition"	Educational Practice	Medienjulia	Wed, 08/07/2020 - 12:09

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My recent content

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STEAM on Edu

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Educational Practices

STEAM discipline: Science, Technology, Engineering, Arts, Mathematics | Audience: - Any - | Audience competence: - Any - | Educational/Training framework: - Any - | Language: - Any - | Items per page: 5 | Apply

Title	Language	STEAM discipline	Published on	Author	Comments	Total views	Rate this Practice
Estimating the area of an irregular shape	EN	Mathematics	Thu, 10/09/2020 - 20:40	György_Éva	0	37	No votes have been submitted yet.
Internet of things in Agrinio	EL	Science, Engineering, Mathematics	Mon, 07/09/2020 - 14:43	Iepapath	0	41	
Maria Sibylla Merian	IT	Science, Technology, Arts	Thu, 16/07/2020 - 23:31	Maria	0	49	
The Catapult Challenge	EN	Science, Technology, Engineering, Arts, Mathematics	Thu, 09/07/2020 - 14:01	CamTim	0	110	
Robotic Village	EL	Science, Technology, Engineering, Arts	Thu, 09/07/2020 - 12:18	Tziadora	0	58	

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Displaying 1 - 5 of 64 (13 pages total)

Community

- 190 members
- 64 practices
- 18 policies

Educational Policies

Originating country | Language: - Any - | Apply

Use 2 letter country code (e.g. GR, IT, RO)

Title	Language	Published on	Authored by	Comments	Total views	Rate this Policy
Πρόταση ένταξης της STEAM εκπαίδευσης στο θεσμό των "Ομίλων" στα Πρότυπα και Πειραματικά Σχολεία	EL	Mon, 24/08/2020 - 23:02	panppap8	0	24	No votes have been submitted yet.
Πρόταση ένταξης της STEAM εκπαίδευσης στο διδακτικό αντικείμενο «Ευέλικτη Ζώνη-Βιωματικές Δράσεις» του δημοτικού σχολείου	EL	Mon, 24/08/2020 - 13:16	panppap8	0	9	No votes have been submitted yet.
Activities of the Länder to strengthen mathematical, scientific and technical education	DE	Sat, 18/07/2020 - 16:23	Katrin_Schuberth	0	8	No votes have been submitted yet.
Elements in briefs	EN	Thu, 09/07/2020 - 13:18	MARTA VENTURELLA	0	14	average 1 votes with an average rating of 3.
Action plan for education in Romania	RO	Tue, 07/07/2020 - 17:50	Laurentiu Bunescu	0	28	No votes have been submitted yet.

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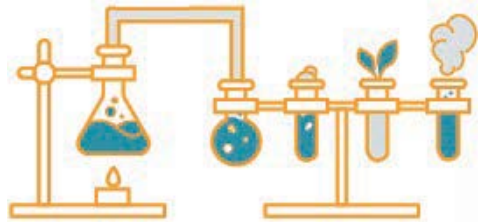
STE(A)M educational objects meta-data schemes

- Meta-data standards
  - Dublin Core Metadata Initiative (DCMI) most recent update (ISO 15836-1:2017), with the corresponding definitions of properties and classes as they have been standardized in ISO 15836-2:2019, which was released in January, 2020.
  - Learning Resource Metadata Initiative (LRMI), which is based on several metadata initiatives (e.g., IEEE LOM DCMI, IMS, ARIADNE, SCORM, etc.) and is an initiative launched by Google, Microsoft, Yahoo and Yandex to create, maintain, and promote schemas for structured data on the Internet.
- Meta-data schemes for STE(A)M…
  - Educational practice
    - 5 parts: General, Author, Audience and educational framework, Educational details, Implementation
    - 32 fields (14 mandatory)
  - Educational policy
    - 3 parts: General, Applicability and audience, Details
    - 20 fields (16 mandatory)



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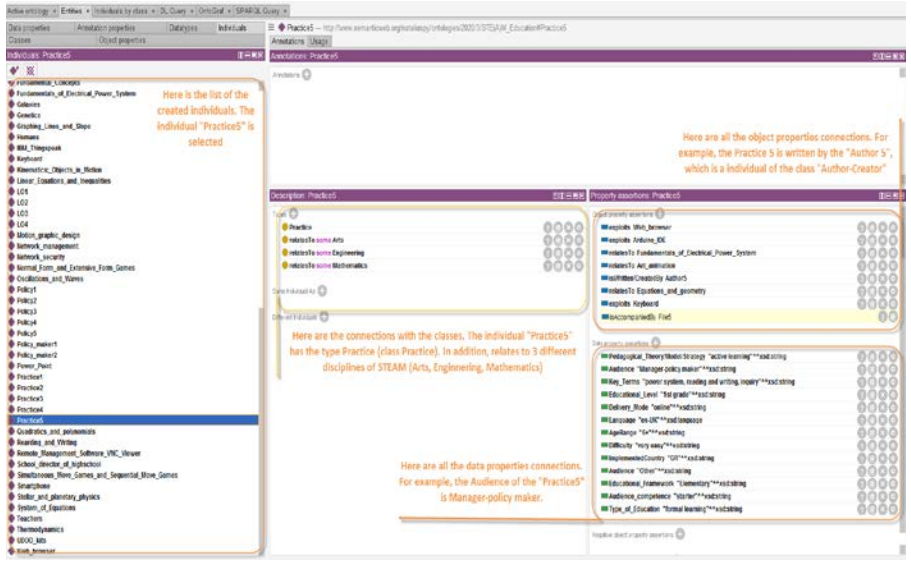
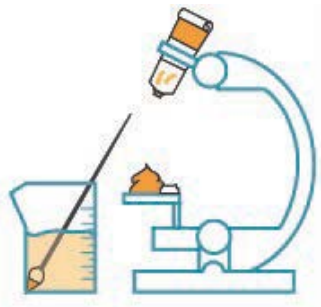
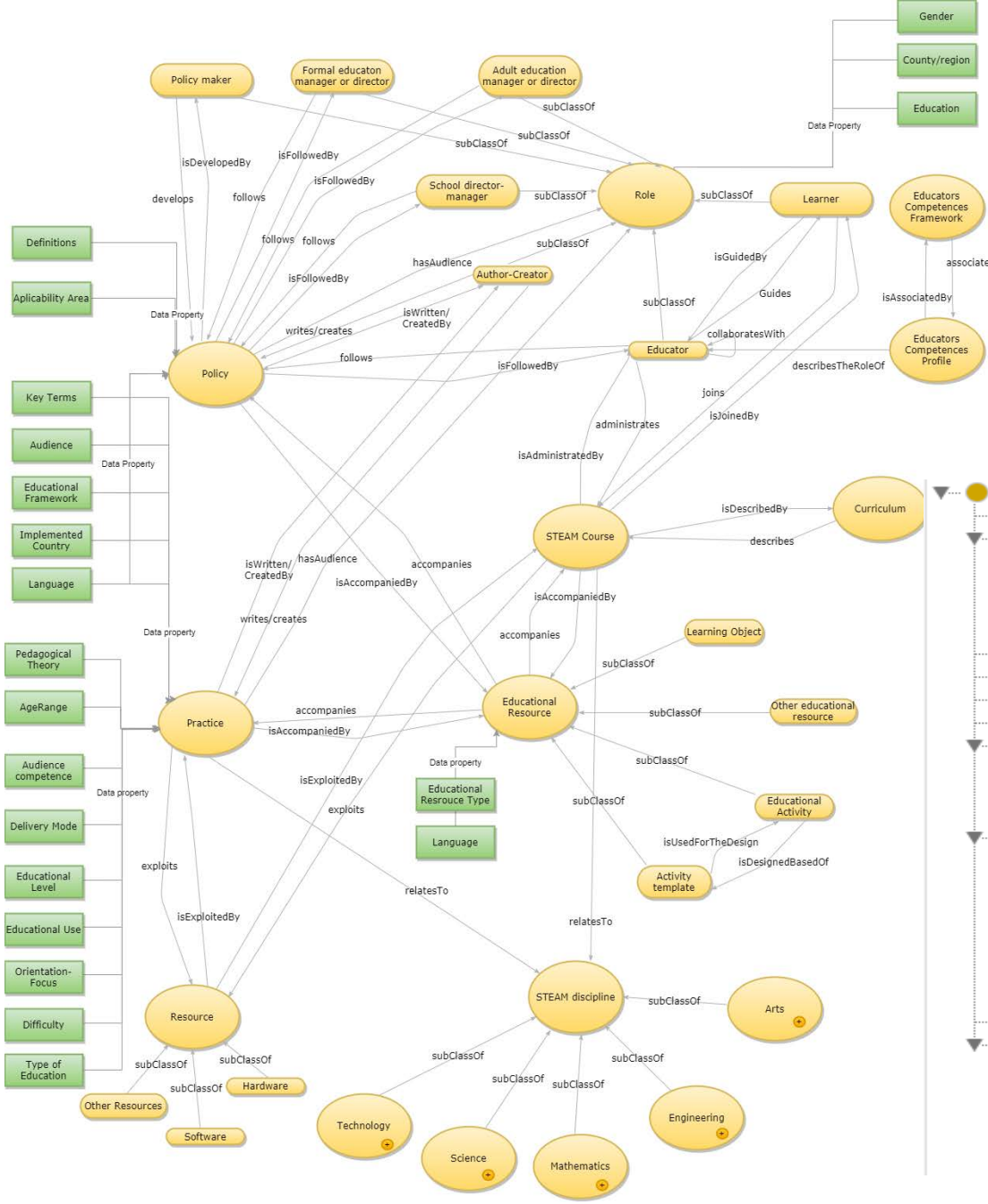
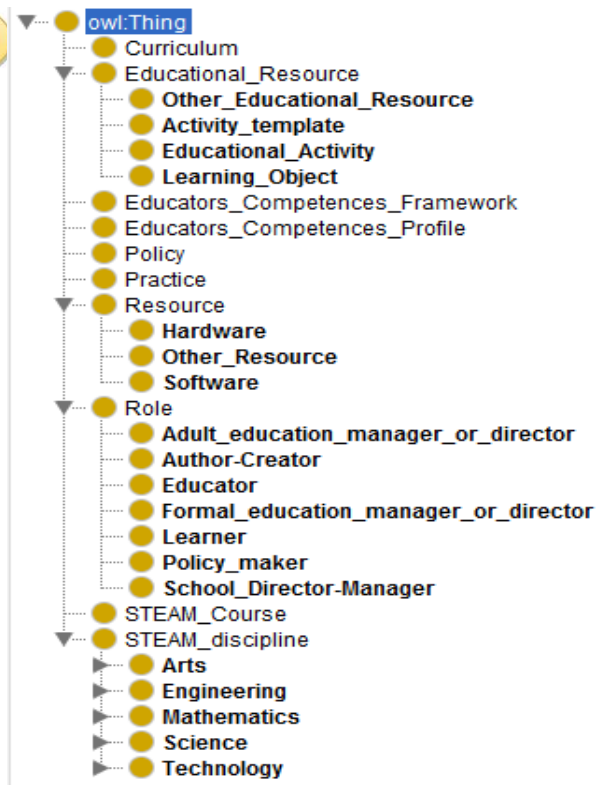
STE(A)M ontology









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Guide of STE(A)M education practices

- More than 60 STE(A)M education practices that have been submitted to our platform have been evaluated using a set of principles and criteria
- Principles
  - Integrated Content
  - Real-word integration
  - STEAM and Beyond
  - Inclusive STEAM education
  - Next Generation/21st Century Skills
  - Project-Based/Problem-Based Learning
  - Authentic Assessment
  - Integrated Learning System
  - Technology-Enabled Learning
  - Learning Technology vs. Teaching Technology
  - Emphasis on Applied Technology
  - Teacher as Facilitator
  - Collaboration
  - Open-Ended Learning
  - Supported

- Currently 11 of them have been labelled as “best practices” and have been included in the Guide
- Criteria (the STE(A)M practice…)
  - Is interdisciplinary and connects numerous subjects?
  - Represents the rich relations between Science, Technology, Engineering, Arts and Mathematics?
  - Supports a complex growth of the learner including intellectual, emotional, and social development?
  - Emphasizes the ethical component of STEAM?
  - Contributes to competence development (includes knowledge, skills, attitudes) and is balanced (between theory and practice)?
  - Is not simply the sum of many components, but holistic in including their various interrelations?
  - Is a social activity with human interaction and emotional involvement?
  - Is learner-centred (aiming to impact individuals and the society)?
  - Is inclusive, gender balanced and values diversity?
  - Etc.

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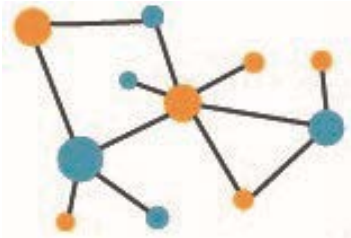
STE(A)M competence framework

- 5 perspectives
  - Educator as teacher-trainer-tutor / implementing the educational procedure
  - Educator as learning designer and creator / designing and producing outcomes
  - Educator as orchestrator and manager / coordinating procedures and outcomes
  - Educator as community member / interacting with the environment
  - Educator as professional / developing and applying competences
- 16 competence areas
  - E.g. Pedagogy, Content knowledge, Learner empowerment, Course / curriculum / activity design, Content design and development, Community building, etc
- 44 competences
- Integrates digital skills and transferrable skills



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Next stages of the project

- Continuous elicitation of STE(A)M education practices and policies
- Broad evaluation of STE(A)M competence framework (November 2020)
- STE(A)M educational practice evaluation framework (December 2020)
- STE(A)M educator competence-based profile(s)
- Instructional design of MOOC and eLearning course
- Development and delivery of MOOC (Spring 2021)

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Online workshop on STEAM Education practices and competences

- When: Thursday 8 October
- Where: ALL DIGITAL Summit 2020 https://summit.all-digital.org/about/
- Programme:
  - Overview of the STEAMonEdu project – Achilles Kameas
  - Basics of STE(A)M education - Spyros Papadakis
  - Characteristics of a STE(A)M education good practice - Paolo Russo
  - Towards a common understanding of a STE(A)M education practice evaluation framework (interactive session) – Gabriella Ford
  - STE(A)M education best practices – Paolo Russo & Esther Subias
  - STE(A)M education competence framework - Natalia Spyropoulou
  - Towards a common understanding of a STE(A)M education competence framework (interactive session) - Natalia Spyropoulou
  - The STEAMonEdu community of STE(A)M educators - Esther Subias
- REGISTER TODAY!

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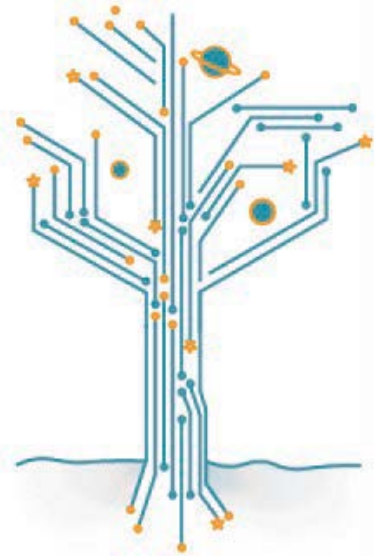
Partnership

- INSTITOUTO TECHNOLOGIAS YPOLOGISTON KAI EKDOSEON DIOFANTOS (EL)
  - Coordinator, competence framework, platform and MOOC, quality assurance
- ALL DIGITAL AISBL (BE)
  - Dissemination and exploitation
- STATI GENERALI DELL INNOVAZIONE DI PROMOZIONE SOCIALE (IT)
  - Evaluation, piloting
- HELLIWOOD MEDIA & EDUCATION IM FJS E.V. (DE)
  - Community management, education framework, piloting
- FUNDATIA EOS - EDUCATING FOR AN OPEN SOCIETY ROMANIA (RO)
  - Training curricula, evaluation piloting
- COLECTIC SCCL (ES)
  - Community management, evaluation, piloting
- REGIONAL DIRECTORATE OF PRIMARY AND SECONDARY EDUCATION OF WESTERN GREECE (EL)
  - Practices and policies, educators' needs, piloting



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Join us!

More info about the STEAMonEdu project at:

- Web: https://steamonedu.eu
- Email: SteamOnEdu@cti.gr
- FB: #SteamOnEdu
- Tw: @SteamOnEdu

More info about DAISSy research group at:

- Web: http://daissy.eap.gr
- Email: info@daissy.eap.gr
- FB: DAISSyResearchGroup
- Twitter: daissy_research
- Instagram: @daissy_researchgroup
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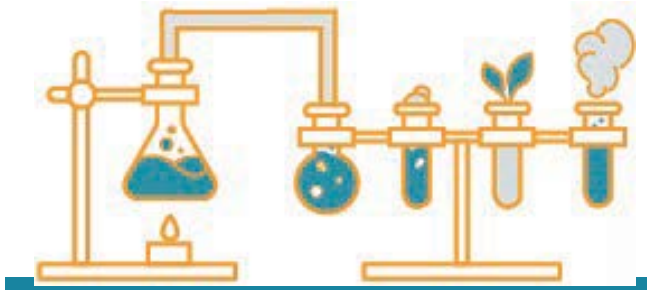

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