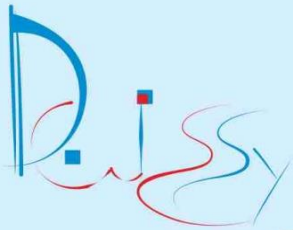# STEAMOnEdu
Competence development of STE(A)M educators through online tools and communities

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Dynamic Ambient Intelligent Social Systems

Computer Technology Institute and Press "Diophantus"

- CTI is a cutting edge research organization supervised by the Greek Ministry of Education
- CTI is the technological pillar for the support of ICT in education, it is responsible for the publishing of printed and electronic materials, and for the administration of the Greek School Network.
- Research Units
  - Foundations of Computer Science
  - Signal Processing &Telecommunications
  - Dynamic Ambient Intelligent Systems
  - Networks, Telematic and New Services
- IST Divisions
  - Greek School Network Division (SCH)
  - Publications
  - Telematics & Regional Applications Development
  - Independent Unit of Information Systems & Network Security
  - Further Education & Training
  - Educational Technology
  - e-Government
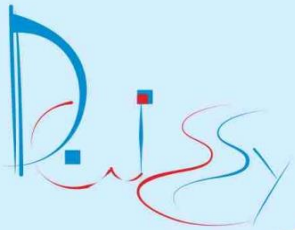
DAISSy: Mission and vision

- The DAISSy (Dynamic Ambient Intelligent Sociotechnical Systems) research group was founded in 2001 by highly skilled and motivated researchers coming from various backgrounds
- The DAISSy group mission is to address societal needs by developing meliorative technology and constantly pursuing innovation
- The vision of the researchers of DAISSy group is to contribute to the realization of an advanced humane society by inventing technology that adapts and supports human needs and not the other way round!
- Since its establishment, DAISSy has coordinated and participated in more than 60 national and European projects, in various frameworks (i.e. FP5, FP6, FP7, Lifelong Learning, Erasmus+, H2020, REC, AMIF etc.), amassing a total funding of more than 3,5 MEuro

Expertise

- DAISSy has accumulated expertise in:
  - Social Computing Systems,
  - MOOCs, Online Learning Platforms,
  - Serious Games, Digital Content,
  - STE(A)M Education,
  - Inclusive Education,
  - IoT and Mobile Systems, Middleware, Architectures,
  - Knowledge Extraction and Representation, Ontologies,
  - Smart Environments, Smart Cities,
  - Quality Assurance, Standards,
  - User Profiling, User Experience,
  - Digital Skills and Competences,
  - Lifelong learning, UpSkilling, Skills Certification,
  - Job Profiling, Learning Pathways

Map of projects

Digital Competences
- ProInternet
- eCultSkills
- CompAAL
- EngAGEnt
- eVirtue
- (SEM@Schools)
- LinguaCuisine
- MuSA
- DCDS
- Smart DevOps
- V4T
- Social Hackademy
- BIBLIO

Culture
- (MuSA)
- EuHerit
- SILVHER
- CrowdDreaming

Tourism
- (InTour)
- Roman routes

Education / Quality
- CRITON
- P4LLL-Tec
- MOOQ
- KUTEL
- Ind4.0
- DELTA
- (PICELS)
- FAVILLE

Ambient Intelligence
- eGadgets
- Plants
- ASTRA
- Hearts
- ATRACO
- ELTab
- ADVENT

Competence Development
- VAB
- LPMnage
- i-Care
- Take Care
- EPOQUE
- DigiPlace
- TOY+
- BRIGHTS
- EcosLIGHT
- InTour
- WATT-Else
- Instruction
- GCTE

Entrepreneurship
- (MILE)
- YouBrand
- Entrepreneurhsip4Women

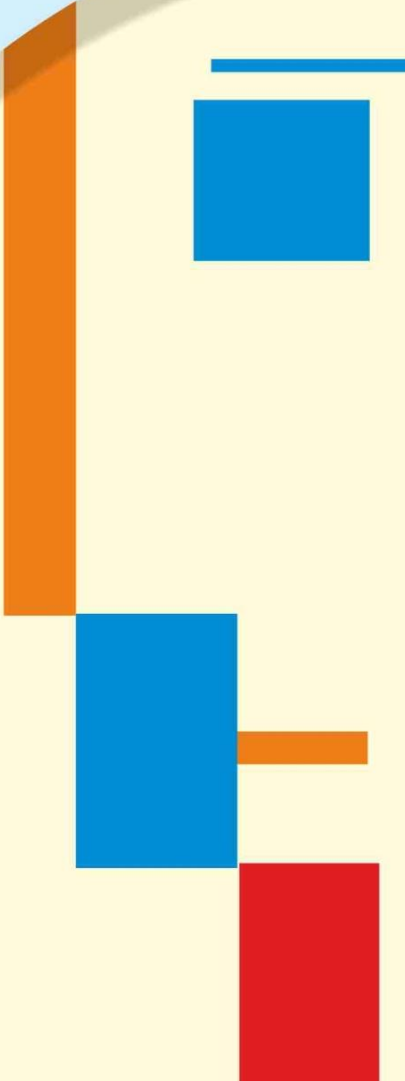**Multi-culturalism and Inclusion**
- TIPS
- Fragmex
- SONETOR
- SONET-Bull
- TIME
- DIVINA-Edu
- (LinguaCuisine)
- (BRIGHTS)
- Tackle
- WEMIN
- MILE
- MiCreate
- Xenia
- REMIDA
- PICELS

STEM education
- SEM@Schools
- UMI-Sci-Ed
- STEAMon

Online platforms

- Digital Competences Development System
- UMI-Sci-Ed online community platform
- SONETOR peer learning platform for intercultural mediators
- SONET-Bull anti-bullying peer learning platform
- SEM@Schools training platform in energy awareness
- EPOQUE platform for environmental training in tertiary education
- FragmEx platform for civil society organizations
- ASTRA IoT platform supporting pervasive awareness for the elderly
- ADVENT AAL platform for the elderly

MOOCs (https://mooc.cti.gr/)

- Essential digital skills for Museum Professionals (MuSA)
- Intergenerational work for practitioners in Early Childhood Education and Care (TOY+)
- Addressing Global Citizenship Education through Digital Storytelling (BRIGHTS)
- Introduction to Basic, Soft and ICT skills for Caregivers (i-Care)
- Introduction to Software Engineering (MOOQ)
- Advanced topics in Software Engineering (MOOQ – in Greek)
- Migrants' integration in the labour market (MILE)
- Youth co-create digital culture (CrowdDreaming)

STE(A)MonEdu: Aims

- to contribute to innovative and cross-disciplinary approaches in implementing STE(A)M education by **revising and strengthening the professional profile** of the teaching profession, and

- to create a solid interdisciplinary research base for **developing STE(A)M related competences**, which are at the heart of technological revolution

Target groups

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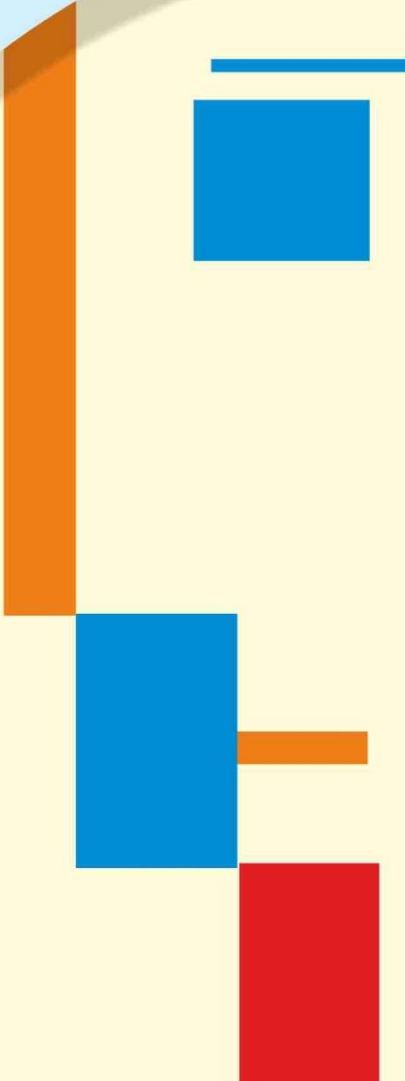- Other stakeholders (e.g. career consultants)

Approach

- The project
  - nominates teachers and educators as the **pillars** of the implementation of STE(A)M education policies and
  - supports their **professional development** both by blended training and by their participation in a community of stakeholders.
- Teachers and educators will be given a central role in designing, implementing and assessing STE(A)M education policies
  - Using a bottom-up approach, the project will allow **community** members to collaboratively design, create and share educational scenarios
  - **Best practices** will be used to inspire and stimulate innovation at system level

- An urgent issue concerning the uptake of STE(A)M as an educational practice is the identification of the roles and competences involved
  - Firstly, a **STE(A)M competence framework** will be designed detailing the competences necessary for implementing STE(A)M education policy and practice
  - Then, as a proof-of-concept, the **STE(A)M educator profile** will be described, as a combination of framework competences
- Professional development of teachers and educators
  - The project will design a **blended training course** that will be delivered via the online platform and use OERs
  - The course will include a **MOOC** based on the profile of STE(A)M educator, supplemented by online and classroom activities
  - Online activities will 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**

Project outputs

- Competence-based tools
  - STE(A)M competence framework (based on DigComp for Edu)
  - STE(A)M educator profile (following ESCO structure)
  - STE(A)M readiness SAT (based on SELFIE)
- Integrated STE(A)M education framework
  - STE(A)M educators community
  - Online collaborative platform
  - Online STE(A)M 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

Partnership

- COMPUTER TECHNOLOGY INSTITUTE & PRESS "DIOPHANTUS" (EL)

- ALL DIGITAL AISBL (BE)

- STATI GENERALI DELL INNOVAZIONE DI PROMOZIONE SOCIALE (IT)

- HELLIWOOD MEDIA & EDUCATION IM FJS E.V. (DE)

- FUNDATIA EOS - EDUCATING FOR AN OPEN SOCIETY ROMANIA (RO)

- COLECTIC SCCL (ES)

- REGIONAL DIRECTORATE OF PRIMARY AND SECONDARY EDUCATION OF WESTERN GREECE (EL)

Preliminary results

- A survey was conducted using an online questionnaire, which was disseminated to individual educators via several social media platforms and online communications such as E-mail, LinkedIn and Facebook.

- The data was collected across 19 different cities/regions of Greece, including remote islands

- It included 59 respondents (26 women), who at the time of the study had implemented STEM-related courses through formal and non-formal education in preschool, primary and secondary education.

- Results will be presented at IEEE EDUCON 2020 conference

How educators face difficulties regarding operating framework

Time constraints
- Adapting educational activities based on the time schedule (11)
- Proper equipment preparation (8)
- Additional personal work after school (4)
- Less theory - more practical educational activities (1)

Infrastructure deficiencies
- Personal purchase of equipment (8)
- Be flexible based on the available resources (7)
- Search for funding (5)

Large number of students
- Students selection (3)

Deficits in supporting the role of the educator
- Improvisation – creation of new educational material (4)
- Help from older students (2)
- Help from manager/school principal (1)

Decreased interest and/or lack of interest from fellow educators
- Ask for collaboration with colleagues (5)

Decreased interest from educational community
- Inform parents about STEM education (11)
- Establishment of learning communities (3)
- Publish good practices (1)

How educators face difficulties regarding specific educators and students characteristics

Lack of skills/knowledge and experience/confidence of educators
- Personal study/research (7)
- Search for suitable educational material (6)
- Professional development (5)
- Monitoring the progress of STEM education (3)
- Self-assessment (1)

Lack of students basic knowledge of STEM fields and technological skills
- Scaffolding process techniques (6)
- Additional help after the end of the lessons (2)
- Implementation of different learning techniques (2)
- Investigation of prior knowledge/reminder prior knowledge (1)
- Use of simple examples from everyday life (1)

Lack of students interest
- Use of student encouragement techniques (5)
- Game-based and collaborative activities (3)
- Participate in contests (2)
- Use of different educational material (e.g. video) (2)
- Hands on activities (1)
- Use of examples from their life (1)

Students perception about education
- Establishment of rules (5)
- Discussion (5)

Thank you!

- Web
  - http://daissy.eap.gr
  - http://sdy.eap.gr
  - http://daisy.cti.gr

- MOOCs
  - https://mooc.cti.gr

- YouTube
  - DAISSy Research Group

- Contact us
  - info@daissy.eap.gr

- LinkedIn
  - daissyresearchgroup

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  - daissy_research

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  - @daissy_researchgroup