Open Technologies Alliance (<https://gfoss.eu/>)

Education - An Open Approach



A proposal for a peer learning exercise

# Aim

The proposed Peer Learning Exercise aims at introducing practitioners to the opportunities in using open educational resources, open software and open hardware within an educational setting. The Peer Learning Exercise will take place in Athens in {DATE}. It will be structured as a [DESCRIPTION}.

The open approach to education that will be examined with this peer exchange exercise aims to provide a set of tools, methodologies and learning activities that support inquiry and an exploration based approach. It strives to create an environment that allows for collaborative interaction among students and teachers as well as with a broader community of people whose main concern is the free access to knowledge.

The results and good practices of this exchange will be disseminated as widely as possible to the educational community in order to be adopted by teachers, students and OER creators. At its core the peer exchange exercise aims to utilizes an open approach to help introduce and develop computational and critical thinking, the ethos of the maker movement new ways to develop skills within a traditional educational setting.

# ICT in Schools

The global education and research community has approached the issue of new digital technologies as an avenue for improving education in the last few decades through many different aspects. Over the last few years, the effort has stepped up given the general penetration of ICT in everyday life.

At European level, many studies have approached the issue of the using new digital technologies as means for improving education. For example:

* European Schoolnet: Survey of schools: ICT in education (OECD, 2009)
* Mainstreaming ICT-enabled Innovation in Education and Training in Europe (Joint Research Center, 2014),
* UNESCO Education Strategy (2014 – 2021) etc, while at European Schoolnet
* Bring your own device: [a guide for schools leaders](http://fcl.eun.org/documents/10180/624810/BYOD%2Breport_Oct2015_final.pdf) (Oct. 2015)
* Computing our future. [Computer programming and coding Priorities, school curricula and initiatives across Europe](http://www.eun.org/c/document_library/get_file?uuid=3596b121-941c-4296-a760-0f4e4795d6fa&amp;groupId=43887) (2015)
* [The School IT Administrator](http://www.eun.org/c/document_library/get_file?uuid=ea8ca89a-d7a5-4ffa-ba30-40c3700a4036&amp;groupId=43887) (2015)
* [Overview and Analysis of 1:1 Learning Initiatives in Europe](http://ftp.jrc.es/EURdoc/JRC81903.pdf) (2013)
* [Introducing tablets in schools](http://1to1.eun.org/c/document_library/get_file?uuid=4507eca6-7707-4cfd-abe3-ad62b25ac847&amp;groupId=10334) (2013)

# **Goals of an Open Approach to Education**

**The pedagogical advantages**

The use of open digital standards, tools and methodologies has pedagogical advantages as it emphasizes the exploration, discovery and structuring of knowledge through active participation and interactive learning environments. The open design of actions requires that learners are actively involved in a democratic environment. Activities are collaborative and student-centered while teachers facilitate a process of learning in which students are encouraged to be responsible, autonomous and creative.

**Developing open digital educational content.**

Open educational content is one of the main pillars for the integration and constructive use of ICT in Primary and Secondary Education. Open Educational Resources, digital repositories for the organization, effective search, discovery and wide availability of educational resources by the educational and student community as well as environments that support the collaboration, communication and exploitation of digital educational content are important elements to the direction of improving the learning process.

For this reason, it is important to ensure the smooth and uninterrupted operation of services offered by OER educational platforms. Emphasis should be placed on improving content quality to improve the quality of metadata describing the OER in order to make the process of discovering the learning objects sought by users (eg types of learning objects, teaching approach) and to ensure the quality of the learning objects being uploaded and published in the Repositories.

Open educational content must include:

* Learning content - complete courses, course content, learning objects, collections, magazines.
* Software tools to support the creation, provision, use and improvement of open learning content, including the search and organization of content.
* Learning and content management systems (LMS, LCMS), content development tools, and Internet Learning Communities (EQS).
* Application Resources - Intellectual Property Licenses to promote open publishing of material, principles of design and localization of content.
* Best practices - techniques, methodologies, processes, incentives, publication, distribution.

**Benefits of Open Resources**

Some of the main benefits of using open resources (software, hardware and OER) in an educational setting include:

• Fully legal resources that are available at no/ cost/ low cost and with less maintenance costs.

• Resources that directly incorporate the latest technological developments.

• Frequent updates with new features.

• Great and friendly community for development and support.

• A lot of additional programs, digital devices and oer, with easy installation and use.

• Stability and security.

• Significantly safer and more reliable than proprietary resources.

• Ability to explore and learn how they work by adapting them to our needs.

More specifically, with regard to open source software, application license fees are, in most cases, zero. No licenses are purchased and we can have an unlimited number of facilities. The use of open source does not limit the organization or the simple user to a company - dependency relationship, and because distribution, error correction and open source development can be done by any technically skilled team, an environment of intense competition is created which leads to low prices and quality support services.

**The re-use of digital resources.**

This approach will accelerate the adoption of new technologies, reduce costs and reduce duplication. To this end, experience to date and the use of common standards and architectures based on open source should be exploited.

The content produced must be written with the Open Educational Resources (OER) principles in mind, ie the digital educational material must be freely and openly offered to teachers, pupils, and learners individually for use or reuse for the purpose of teaching, learning and research. All educational materials developed for our initiatives are available as e-learning modules at <https://elearn.ellak.gr/>.

**The need for Open Standards**

The main purposes of the digital open standards for educational development include:

* improving basic skills in science, technology and digital competence of students of primary and secondary education
* the use of ICT in primary and secondary education
* creating the conditions for learning motivation and initiative
* the acquisition of basic life skills enhancing self-esteem, confidence and sociability through group-collaborative actions
* improving basic knowledge and life skills needed in a rapidly changing socioeconomic environment
* Improving Innovation

The aim for the introduction of open standards is to facilitate a different way of teaching beyond traditional classic educational approaches. It will incorporate teachers and students in a broader community of developers, users, makers, producers of open educational resources and pioneers of new educational approaches.

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# **Open Education in Greece - Best practices**

The following are examples of open education initiatives in Greece that can be presented during the proposed peer exchange meeting in Athens and used as a starting point for discussion:

**OLPC Greece**

The [Greek One Laptop Per Child pilot](http://wiki.laptop.org/go/OLPC_Greece) which deployed 630 XO-1 laptops to [35 schools across the country](https://docs.google.com/spreadsheets/d/1JJjNtadqcR18U1h2H5NQ2EDu7JqvMZLWgeHLEJ_FcTw/pub?single=true&gid=3&output=html). The [project included](https://old.ellak.gr/indexe715.html) the preparation of laptops, rollout, initial teacher training, production of support software applications, manual and training materials. Part of the project included [running a small lab](https://olpcatarsis.wordpress.com/2010/04/10/%CE%B7-%CF%80%CF%81%CF%8E%CF%84%CE%B7-%CE%B3%CE%BD%CF%89%CF%81%CE%B9%CE%BC%CE%AF%CE%B1-%CE%BC%CE%B5-%CF%84%CE%BF%CE%BD-%CF%85%CF%80%CE%BF%CE%BB%CE%BF%CE%B3%CE%B9%CF%83%CF%84%CE%AE/), similar to the one proposed, in collaboration with Arsis at the Shelter for the Temporary Stay of Minors.

**Open Wifi**

The [Open WiFi](https://openwifi.ellak.gr/i-drasi-openwifi-tis-eellak/) project we have deployed [42 wireless networks with 545 access points](https://openwifi.ellak.gr/openwifi-map/) using [Open Mesh](http://www.open-mesh.com/) technologies. We also collaborate with the [Ministry of Education](https://diavgeia.gov.gr/doc/6%CE%9E794653%CE%A0%CE%A3-%CE%A4%CE%A9%CE%98) and GFOSS members to provide broadband backbone links to refugee camps through the Greek Research and Technology Network ([GRNet](https://grnet.gr/en/company/)) .

**Schools Open to Society & Hack your classroom**

Through the [Schools Open to Society](https://mycontent.ellak.gr/drasi-scholia-anichta-stin-kinonia/) project we have significant experience in designing and delivering educational programs that cover both young students and adults. In our collaboration with the Municipality of Athens we have managed to use our network of volunteers to offer courses in [3d printing,](https://mycontent.ellak.gr/scholio-trisdiastatis-ektiposis) [Creating Open Educational Resources](https://mycontent.ellak.gr/scholio-anikton-ekpedeftikon-poron), [OpenStreetMap](https://mycontent.ellak.gr/scholio-openstreetmap), [Wikipedia](https://mycontent.ellak.gr/scholio-vikipedias), [Coding Schools](https://mycontent.ellak.gr/scholio-isagogis-ke-exikiosis-me-ton-programmatismo/) and [Using Ubuntu Linux.](https://mycontent.ellak.gr/mathimata-egkatastasis-ke-rithmisis-ubuntu-linux/) A similar project, “Hack” your classroom is run in conkuction with the Onassis Cultural Center. The project calls for students identifying a problem in their learning space and trying to come up with creative solution to address it using open technologies (for example Arduino microcontrollers, 3d printing, open robotics).

**Open Technologies Pilot Lab**

The Open Technologies Lab (OTL) in the 5th Lyceum of Vyronas was designed to facilitate a traditional school computer lab. It can also be used as a makerspace, available during the weekends for use by the community. The OTL is built around relatively inexpensive single-board computers such as the Raspberry Pi, a PC used as a server, a network switch and in some cases a 3D printer.

These single-computer boards, besides running general computing applications, can also be repurposed and used as controllers of sensors, motors etc. allowing for a more diverse range of skills to be taught at each lab. The initial pilot lab is [operating at the 5th Lyceum of Vyronas](https://ellak.gr/wiki/index.php?title=%CE%A3%CF%87%CE%BF%CE%BB%CE%B9%CE%BA%CF%8C_%CE%95%CF%81%CE%B3%CE%B1%CF%83%CF%84%CE%AE%CF%81%CE%B9%CE%BF_%CE%91%CE%BD%CE%BF%CE%B9%CF%87%CF%84%CF%8E%CE%BD_%CE%A4%CE%B5%CF%87%CE%BD%CE%BF%CE%BB%CE%BF%CE%B3%CE%B9%CF%8E%CE%BD_-_5%CE%BF_%CE%93%CE%95%CE%9B_%CE%92%CF%8D%CF%81%CF%89%CE%BD%CE%B1) and is open for visits. An extensive presentation of the lab that also details the uses of the computers for coding instruction and school robotics is [available here](https://ellak.gr/wiki/images/4/47/ErgAnoixTexn.pdf).

**EduLabs**

EduLabs are an [effort to scale-up](http://edulabs.minedu.gov.gr/about) the Open Technologies pilot lab. At the moment there are 22 EduLabs in operation, funded mainly by private donations, while 212 are being prepared by the Greek Ministry of Education.

Ideally an open technologies laboratory is set up and operates exclusively with open hardware, open software and OER. This integrates people who work within it (educators and students) into a wider community of people, whose main concern is free access to knowledge and the diffusion of good practices.

Open technologies allow access to and interaction with the material. Typical examples are Arduino, RepRap technologies, Beagleboards etc. Such devices demystify the technology. Informatics and related sciences cease to be an incomprehensible or hostile environment. Such approaches encourage testing, experimentation and support inventive thinking and creativity.

**3d printing school pilot**

The main [objective of this effort](https://edu.ellak.gr/2017/11/06/kalesma-gia-ipovoli-protaseon-gia-ekpedeftiki-chrisi-5-ektipoton-3d-printers/) was to be an introduction to the practices, methodologies and options available in the use of three-dimensional printers in education. Five printers were loaned out to schools for a school year to facilitate the introduction of three-dimensional printing concepts, the basic tools for designing and customizing objects, the philosophies and methodologies of incorporating these technologies in the learning process (for example systems thinking, design thinking) as well as the potential benefits or problems of their adoption.

Each participation school undertook the production of an electronic logbook of students 'and teachers' work with the printer on a public website. A final report presentation was also produced, including the conclusions of using the printer, the lesson plans, and the object files All material was made available as Open Educational Resources.

**Code + Create**[Code+Create](https://www.facebook.com/codecreateworld/) workshops were organised in Athens from May to June 2017. The workshops held every weekend have focused on learning skills such as the basics of coding, robotics, image editing and 3D printing. Half of the participants were of Greek origin, while the other half had a refugee background. All software, educational resources and hardware (where possible) used were open. The project continued for 2018 with an additional instruction site being added to the programme.