

## Innovative practices and technologies in educational projects of European Schoolnet and the project “Scientix”

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European Schoolnet (EUN) was established in 1997 as a non-governmental organization of 31 Ministries of Education in Europe, which provides major European education portals for teaching, learning and collaboration. European Schoolnet (EUN) provides major European education portals for teaching, learning and collaborating and leads the way in bringing about change in schooling through the use of new technologies and innovative teaching methods. EUN has been tackling the reasons for that lack of interest in MST education, especially developing and extending the ways in which science is taught. To help implement innovative methods and teaching practices, effective use of ICT and the latest trends in education, European Schoolnet create guidelines for best practices in various aspects of teaching, including the training of teachers. The guidelines are based on scientific reports, studies and distribution through pilot schools performed within its projects or with ministries of education or with partners from industry.

To ensure regular dissemination and sharing of progress, know-how and best practices in science education and to provide a feedback mechanism the European Commission launched a project Scientix, managed by European Schoolnet (EUN) on behalf of DG “Research” and funded by the 7th Framework Programme.

Scientix portal <http://scientix.eu> is available in six European languages. Main user groups are teachers, but the audience is much wider – from scientists and researchers to students, parents and politicians and all stakeholders.

The project offers a resource repository of hundreds of educational materials from European projects, research reports, and opportunities for access to documents; options for filing an application for transfer of learning materials in the 23 languages of the European Union. Online platform offers communication, including forum and chat rooms, online news including international scientific topics related to education and a calendar of upcoming events. A valuable asset is the ability to online training and regularly receive a monthly newsletter to registered users. The platform is dynamic and focused on consumers.

In the first phase (2009–2012), was created as an online portal repository projects in science, mathematics and technology (STEM) and began spreading the project. The main initiative of SCIENTIX conference was held in May 2011 in Brussels.

The aim of the second phase (2013–2015) is the distribution at the national level to reach a wider audience and teaching contribute to the uptake of innovative practices and new methods of training in education.

**Key words:** innovative practices and technologies, european schoolnet, project “Scientix”, ingenius project, european schoolnet academy, virtual labs and remote labs

### INNOVATIVE PRACTICES IN THE PROJECTS OF EUROPEAN SCHOOLNET

In recent years there has been an alarming decline in interest among young people for the study of natural and engineering sciences and mathematics, both in our country and in Europe. Moreover, among the general population, threatening reduces the acquisition of basic skills that are important in all areas of life in the community. Teachers, professors and researchers from universities should to have quick access to all initiatives, know-how and best practices, as well as changes in terms of training, which can increase the interest of young people to science and research.

One of the projects of European Schoolnet using innovative practices is the project InGenius. It is a joint initiative launched by European Schoolnet and



Fig. 1. European Schoolnet projects.

the European Round Table of Industrialists (ERT) in order to increase the interest of young Europeans in science education and careers and thus to meet the expected future skills gaps within the European Union.

Through strategic partnerships between key industries and ministries of education project involves

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1,000 schools across Europe. The project involved 42 partners from 20 countries, including seven major industries.

During the project as a pilot school had the opportunity to test a variety of resources related to STEM education, to participate in a web binary, discussions related to various best practices, discuss problems in education and to suggest ways to overcome them, to participate in various activities related to the industry as a visiting factories and companies and discussions with their managers, visiting research laboratories and museums, and participate in competitions. Was very useful guide for visiting the companies that can be used in industrial practice: <http://www.ingenious-science.eu/web/guest/ingenious-code>

Testing the various resources associated with completing questionnaires from both teachers and students who submit opinions to the appropriate resources and suggestions for improvement. As in the beginning of the school year and at the end of filling questionnaires sharpening students' attention on the relationship between science education and industry and their success in life.

Interesting resources for a football game that can be used to improve scientific knowledge and those in mathematics, by energy, energy efficiency and ecology and the relationship of science and technology with industry project has InGenius: <http://www.ingenious-science.eu/web/guest>

During the chats students have the opportunity to communicate and ask questions of professionals from various fields, which they had previously prepared using different sources. During testing, the teachers and students had the opportunity to adapt the practices. An example of such adaptation is testing the resource Volvo's poster “Mathematic practice”: [http://www.ingenious-science.eu/c/document\\_library/get\\_file?folderId=199356&name=DLFE-4048.pdf](http://www.ingenious-science.eu/c/document_library/get_file?folderId=199356&name=DLFE-4048.pdf)

There were organized different competitions, which joined teachers from Bulgaria too: <http://www.ingenious-science.eu/web/guest/competition-for-schools>

After discussions of best practices was a summary of the discussions. For example, after the discussion on “Using Astronomy as an aid to teaching STEM” its results were published on: <http://www.ingenious-science.eu/web/cop9/conclusion>

One major initiative InGenius project training courses for Future classroom and Innovative teaching practices - European Schoolnet Academy. After the

successful first phase of the project started the second phase of these training courses. During the course of innovative practices was demonstrated using web binary videoconferencing virtual laboratories and remote laboratories. The past is important for science education of young people. Studies show that the use of learning methods to study more likely to understand and remember this phenomenon or process. Two-day workshops and five-day courses on different topics will be organised at the Future Classroom Lab in Brussels. More information about training programme here: <http://www.eun.org/teaching/teacher-training>

The role of the teacher in the preliminary preparation for learning through research is leading. He led the study indicating preliminary information about the study plan of the study, assisted students in designing hypotheses set tasks to be performed during the experiment and requires summarizing their respective protocols. Before making remote experiment in advance should contact the research center and the state during the experiment, assigns students to be studied phenomenon will experiment and prepare questions for researchers.

One of the problems that can arise are technical - problems with internet connection, webcam, headset or need to communicate in a foreign language, which may be different from English. It is necessary to have installed the appropriate platform for video:

- Webex – <http://www.webex.com/>
- Google Hangouts – <http://www.google.com/hangouts>
- MashMe.tv – [www.mashme.tv](http://www.mashme.tv)

Are effective simulation / online labs?

If well planned, including instructions, learning to study through online labs and simulations superiority over awareness lessons. Students in online laboratories obtain the same level of knowledge or advanced level of knowledge of students who learn in a real laboratory.

In educational platform “Scientix” uploaded a lot of resources and projects involving innovative educational practices and technologies that are useful for improving the quality of education physics and astronomy as: EU-HOU, Global excursion, Go lab, InGenius project, Nanopinium, Spice, Establish, Genis-Lab, Items etc.. The platform itself provides opportunities for online communication, free use of uploaded resources for doing videoconferencing and training of Moodle.

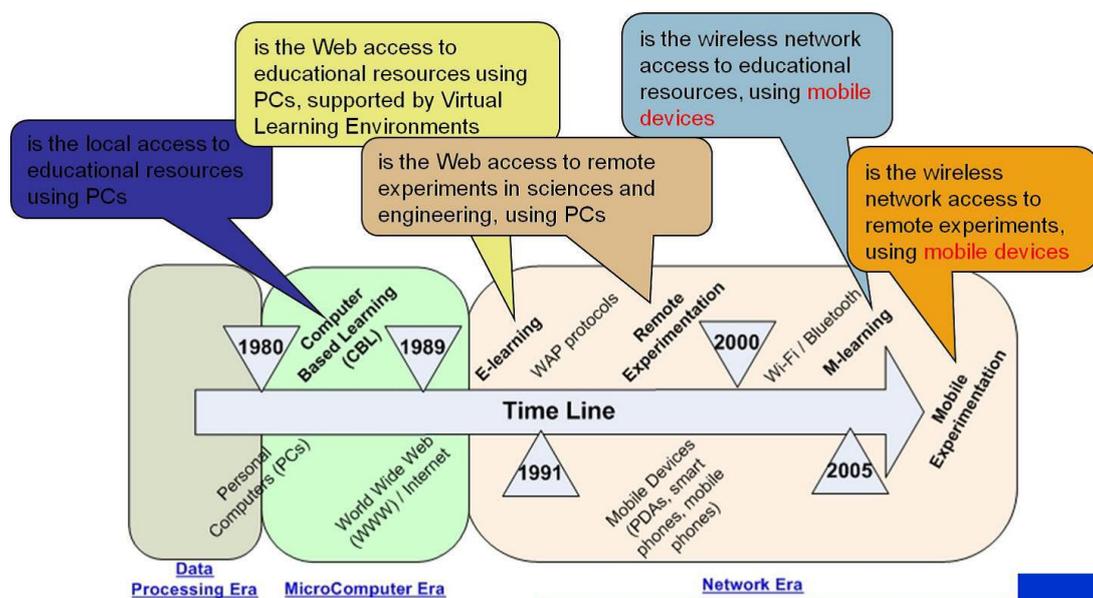


Fig. 2. Development of remote experiments with the development of Internet and computer technology.

Upcoming initiative Scientix 2 conference from 24 to 26 October 2014 in Brussels. Project details can be found on the website of the project: [www.scientix.eu](http://www.scientix.eu) and presentations uploaded to my blog: <http://ceca-scientix.blogspot.com/>

Part of the Global excursion is Virtual Science hub – ViSH ([www.vishub.org](http://www.vishub.org)), which includes a variety of features and options to make presentations by flash cards, google maps, images from the Internet, movies from you tube, use chat, rating resources, sharing of resources, use of other resources uploaded online in your presentation, and the possibility of videoconferencing as MashMeTV.

Example of Remote experiments:

Robotic tuna:

<http://www.youtube.com/watch?v=pDitxrXeYnA>

Curiosity rover-Mars Science Laboratory:

<http://www.youtube.com/watch?v=P4boyXQuUIw>

Other virtual laboratories:

<http://www.simquest.nl/SQsims.jsp>

<http://phet.colorado.edu>

<http://home.web.cern.ch/>

[http://www.donanareservas.com/entorno\\_en.php](http://www.donanareservas.com/entorno_en.php)

<http://www.projectolynx.com/ao-vivo/>

<http://societyize.eu/?q=pt-pt/node/382>

<http://cellspotting.societyize.eu>

<http://www.go-lab-project.eu/lab/sun4all>

[http://cosmoquest.org/projects/moon\\_mappers/](http://cosmoquest.org/projects/moon_mappers/)

<https://www.zooniverse.org/>

<http://boinc.berkeley.edu/projects.php>

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<http://rrlab.bifi.es/home>

<http://www.bifi.es/en/infrastructures/edificio-id/laboratories/2103-supercomputing-lab>

The high cost of equipment brings us to the first barrier in practice using traditional laboratories. On-line labs allow the implementation of real Experiment, regardless of time and distance, reducing the cost of equipment, personnel and maintenance of laboratory demonstrate in class specific thematic experiments without using laboratory equipment. These labs are available seven days a week for 24 hours, allowing the students to coordinate laboratory practice with their own agenda and are free. Remote laboratory can be used to improve laboratory work students with engineering or physics or seek new and effective forms of education.

Innovative practices and new methodologies in the projects of European Schoolnet and the project “Scientix” are interesting, attractive, new technologies have applications for handheld computers, laptops, tablets, online phones. Knowledge and the use of a guarantee for quality science education.

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- [5] <http://www.ingenious-science.eu/web/guest>
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## ТЕХНОЛОГИЧНИ И МЕТОДИЧЕСКИ АСПЕКТИ НА УСВОЯВАНЕТО НА ПОНЯТИЯ В ОБУЧЕНИЕТО ПО ФИЗИКА

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(Резюме)

През последните години се наблюдава тревожен спад на интерес сред младите хора за изучаване на природни и инженерни науки и математика, както в нашата страна, така и в Европа. Освен това, сред населението като цяло, заплашително намалява придобиването на основните умения, които са от важно значение във всички области на живота в обществото.

Би трябвало учители, преподаватели от университети и изследователи да имат бърз достъп до всички инициативи, ноу-хау и добри практики, както и до промените по отношение на обучението, което може да доведе до увеличаване на интереса на младите хора към природни науки и научни изследвания.

За да отговори на тези изисквания от декември 2009 г. стартира нова, уеб базирана информационна платформа "Scientix", управлявана от Европейската Училищна Мрежа от името на ГД "Изследвания" на Европейската комисия [1-3].

Европейска училищна мрежа (EUN) е създадена през 1997 година като неправителствена организация от 30 министерства на образованието в Европа, която предвижда големи европейски образователни портали за обучение, преподаване и съвместна работа. Има водеща роля в постигането на промяна в образованието чрез използването на нови технологии.

Едни от интересните инициативи на EUN са онлайн курсовете, които са достъпни за всички, като иновативните практики за подпомагане на обучението по природни науки и класната стая на бъдещето.

В образователната платформа "Scientix" са качени много ресурси и проекти, които са полезни за подобряване качеството на образованието физика и астрономия, на които ще се спра подробно: EU-HOU, Global excursion, Go lab, InGenius project, Nanopinium, Spice, Items и др.

Европейската комисия възнамерява да инвестира повече в образованието и изследователските проекти, което ще доведе до стабилно обществено развитие в бъдеще.

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