

Telecom Italia S.p.A.: educ@Tion – a solution for sustainable collaborative and social learning

Overview

educ@Tion from Telecom Italia is a web application solution available to schools and designed to encourage sustainable collaborative and social learning. Based on integrating open source modules and Telecom Italia developments that do not require users to buy third party licenses, it has an inclusive approach towards both content (multimedia, editorial, self-produced, available on the internet) and devices (not imposing hardware pre-requirements).

The prototype, available in the laboratories of Telecom Italia TILab innovation centre, is currently being tested in several Italian schools and a teacher training university with trainee teachers at their school placements.

For pictures and videos, see:

http://www.youtube.com/embed/gl_iVzzz8Mk

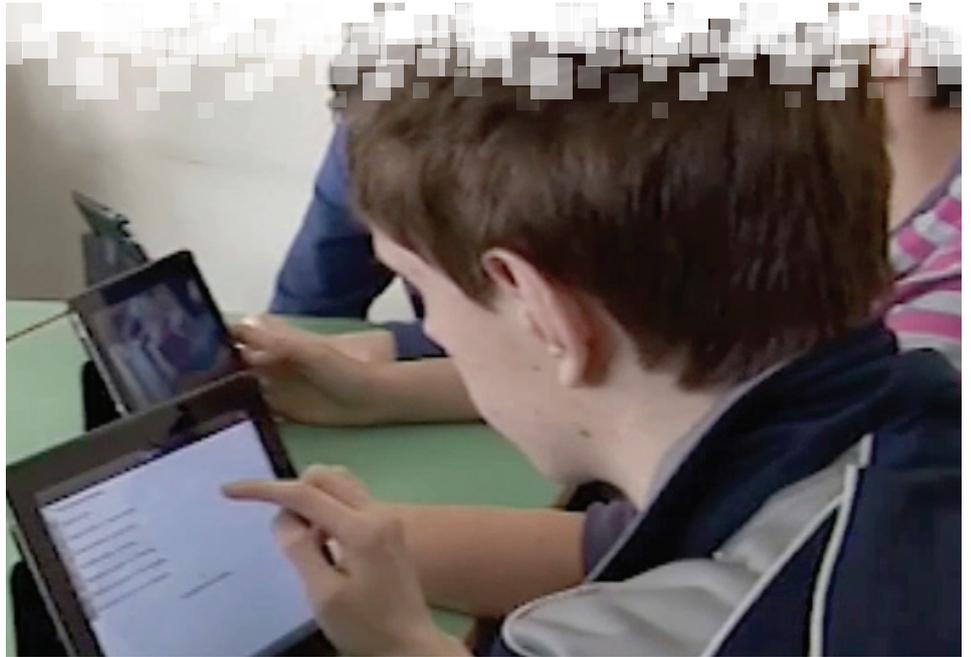
The learners

educ@Tion has been designed and developed to offer a framework of tools for use in primary schools for children aged 6 to 10, in junior schools for children aged 11 to 13 and in senior high schools for learners aged 14 to 18.

A new approach to learning

educ@Tion's goal is a new approach to learning based on the teachings of the well-known theorists Piaget and Vygotsky. It involves methodological innovation (constructivism, proximal development, positive interdependence, structuring of roles) designed to achieve:

- cooperative and participatory learning – with students as active agents in their learning, not just receiving content but also building their own knowledge
- peer education – starting a collaborative relationship between students during the educational process (the student is led to seek solutions and contribute to the learning/teaching process of others).



educ@Tion aims to exploit innovative technology for the benefit of students, in particular to:

- establish social networks with an educational aim
- promote collaborative learning communities
- overcome time and space barriers to teaching
- exploit the benefit of connectivity (from 'school on the net' to a 'net of schools').

Key features

educ@Tion is based on an SaaS (Software-as-a-Service) approach, supported by cloud computing. The system does not need to interoperate with other solutions; it just needs an internet connection that can be supplied via wired platform (e.g. ADSL at home, via Ethernet at school) or wireless (e.g. WiFi at school or home, or GSM everywhere else). There are no specific operating system requirements or device constraints, which means it can be used with interactive whiteboards, video projectors, PCs, netbooks, notebooks and interactive touchscreen tablets – all tools frequently used for teaching and learning in schools.

The applications share the same database, school content management, user authentication system and semantic search engine, and are integrated with an advanced administration data management solution. They allow collaborative creation, multimedia aggregation of contents, the sharing of lessons and knowledge, and the promotion of virtual communities. They can be integrated with dashboard data management and school administration systems.

All the applications accessed via a browser are based on html5 and, in the case of high graphic interaction for remote learning, have been developed in Adobe Flash/Air. Specific client apps for Android and iOS environments have been developed to allow a complete and enhanced user experience that permits the use of all educ@Tion functionalities on all types of devices, using all the capabilities offered by new tablet environments.

Note: Although educ@Tion tools can be used on smaller screens (such as smartphone, Android, iOS and Symbian equipped), they work best on mobile devices with 7–10 inch screens.

Reliability and security

System reliability is guaranteed by the use of Telecom Italia's cloud computing platform, which assures continuity in delivering services and guarantees the flexibility to adapt to the different computing needs of customers, thanks to its cloud and virtualised architecture.

Security is ensured through Telecom Italia public cloud infrastructure certifications, which also guarantee that all applications keep running on the cloud computing system. Single-Sign-On and profiling systems strengthen the security and offer flexibility in the platform management: functionalities can be enabled or disabled to users, according to their profile or role, managing the administration area and disseminating the new security policy to the whole framework, in a transparent way for users.

Learning content

The schools currently upload their own learning content (from newspapers, scientific texts from the internet, abstracts of history books, images, maps, legal texts, etc.), both self-generated and acquired from the internet/publishers, but Telecom Italia is interested in designing a more effective and complete offer for schools (see 'What next' on page 4).

Students – taking an active part in learning educ@Tion includes applications designed for cooperative learning, based on Web 2.0 technologies, where students become an active part of the learning process:

■ society@school:

- **Social Reading:** Traditionally, reading is an activity that students undertake alone, but now electronic books have introduced a new dimension to the reading experience: interactivity. Students can interact with the book and share their annotations with others: the social reading experience involves students directly in an active reading process. Students and teachers read a digital text (i.e. an ebook) and can post their notes on the educ@Tion



web portal, comment on the notes of others, vote for the best notes, share them with the classroom, with other classes within the same school or in different schools. Teachers can use the notes to guide the students' reading, highlighting important paragraphs or attracting their attention to specific points.

Sharing notes and reading the notes of others while reading is motivating for students, transforming the reading activity into a social experience that will connect them with their schoolmates, helping them to support each other.

■ iSchool:

- **Multimedia editorial mash up:** Teachers and students are actively involved in collaborative creation of multimedia teaching materials: students are requested to integrate multimedia contributions in the teacher's text, and this is published once approved. Telecom Italia is also working on introducing WebQuest methodology for use by single students and groups to guide them in internet research on how to do this.

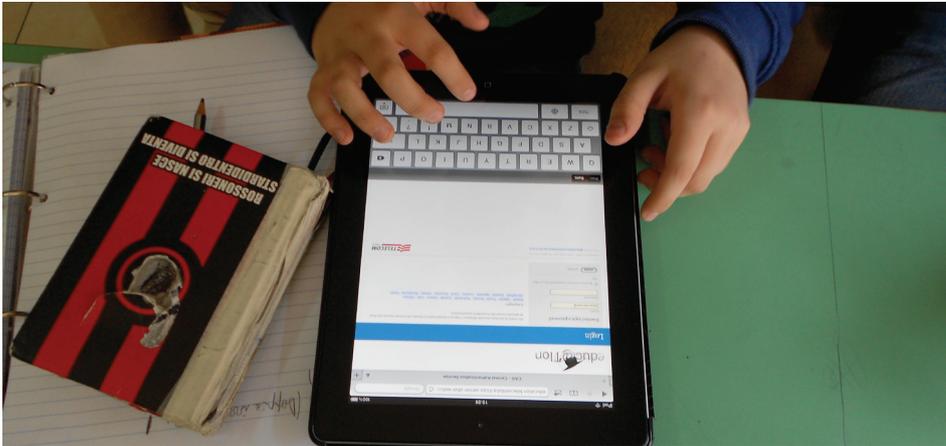
■ iBoard:

- **Virtual Classroom:** This allows synchronous remote shared lessons, triggering a two-way audio-video link and sharing teaching and 'blackboard' (virtual or interactive) contents, plus collaboration. It also allows asynchronous recording of the lesson (audio, video and interactive whiteboard content) and subsequently makes the recording available to the student along with the relevant materials.

- **Lectio Repartita:** This enables a joint lesson with two classes (in the same or different schools) connected using audio-video and sharing a whiteboard and teaching materials. Visualization and collaborative capabilities can also be controlled remotely. This means that lessons can be focussed on groups defined by knowledge levels (rather than a group of class students), forming clusters/virtual classrooms by using microphones and personal headphones, sharing a collaborative board, teaching materials, etc.

- **Lessons with interactive whiteboards (IWBs):** The teacher's lesson is projected on the IWB, allowing the possibility of remote interaction on the same device by the students. The teacher can then decide on the collaborative mode (e.g. multiple or single, enabling or disabling of students' ability to interact) and prepare and post the lesson in the eLearning module of the educ@Tion Learning Management System. This also enables users to collaborate on creating mind maps to support the learning process and/or evaluating/controlling proper understanding of the learning materials.

- **Universal IWB:** Currently different classrooms in the same school may be equipped with IWBs from different suppliers, meaning that different user interfaces can lead to time-consuming problems. In some cases this may even prevent teachers from reusing resources, forcing them to rework material for the same lesson in different classrooms. iBoard offers one single user environment, independent of the brand of IWB.



The use of cloud computing ensures flexibility and scalability, allowing users to tailor the application according to their specific needs, while the multi-tenancy approach can reduce or even eliminate any impact on school capacity.

For more details of the innovative editorial mash up, see below.

Business model

Telecom Italia has been working on its prototype version of *educ@Tion* since 2010, and the trials that have taken place in schools over the last two school

years have been directly supported by TILab. The devices and connectivity are currently paid for by the schools and the students/their families but it is hoped to develop a complete commercial offer for schools by 2014/15 when all Italian schools will need to be able to use digital contents. Telecom Italia has already a commercial offer for schools for the provision of personal and class devices for administration, and for connectivity. *educ@Tion* is looking at enriching this offer in the future, possibly with the acquisition of didactic content, training programmes for teachers, and connectivity facilities for families.

Access to and use of the solution may be based on a monthly/yearly fee paid by the school, depending on the total number of students, or the school may be charged only for the use of the Telecom Italia public cloud infrastructure and the related connectivity and additional services, allowing the use of the basic *educ@Tion* features for free. The possible scenarios for Telecom Italia Business Model are currently being evaluated by the marketing department and may include partnership with multimedia content providers, school education publishers and teacher training providers.

Regulation/Government

educ@Tion is aligned with the Italian Government's Digital Agenda, which was published in October 2012 and outlines a vision for a digitalised environment in the school system. It is also supported by Telecom Italia's agreement with the Italian Ministry of Education, Universities and Research.

Success to date

During the academic year 2010/2011, Telecom Italia ran two trials in Italian senior high schools (a technical high school in Trento, Northern Italy, and a humanistic high school in Naples) in which teachers and students tested the editorial mash up module. Both schools reported increased student involvement and enthusiasm, and higher grades in the classes involved.

Editorial mash up multimedia environment

Editorial mash up works as follows:

- The teacher starts a lesson by publishing a source text. Students are then asked to contribute (at school or at home) with extra materials of any type and size – text, images, videos, audio files, etc.
- All student-proposed content is validated by the teacher who can accept or reject it on the grounds of relevance and quality. They may also assign a grade and comment.
- Approved content is published and made visible to the rest of the group (e.g. class, course, school...) and becomes an integral part of the lesson.
- Once the collaborative process is complete, the 'mash up' lesson can be accessed by students, directly online on *educ@Tion* or as a PDF or ePub-formatted ebook, automatically generated by the system.

This makes the students agents of their own training and educational material developed in this way can be re-used (as a readymade lesson or a basis for further customisation) in the training of another class or another school, and at a later time.

A group, single class, multiple classes, school or schools may cooperate on content creation; thus encouraging the growth of virtual communities for cooperative learning and knowledge construction, supported by technology.

- In Trento the failure rate in the class involved in the trial was 12.5% compared to 15.1% for the other 10 first classes of the Institute.
- In both schools classes involved achieved a higher grade point average on all subjects than other school departments.
- An anonymous questionnaire recorded a student approval rating of 100%, together with the unanimous request to continue with the use of ICT technologies in the next year.
- Class councils asked the school to continue the trial (with a voluntary offer of financial support from parents), based on the greater enthusiasm for school shown by students.

The data gathered indicates that the use of ICT solutions for digital learning grew during the trial, driven not only by the 'start-up-effect' but by increasing interest in the classes.

Both schools (particularly the head teachers and teachers) expressed very high levels of approval for the project, even though it involved a great deal of initial effort for teachers.

In 2011/12 the *educ@Tion* trials were extended to three senior high schools (in Emilia Romagna, Turin, Bozen) and two junior high schools (in Caltanissetta, Sicily and Emilia Romagna) with the same positive reaction from students and teachers.

In the current academic year 2012/13 the trials have been extended to a total of ten schools and about 600 students; and for the first time a primary school is taking part.

How students and teachers feel about using iSchool

Learners' responses:

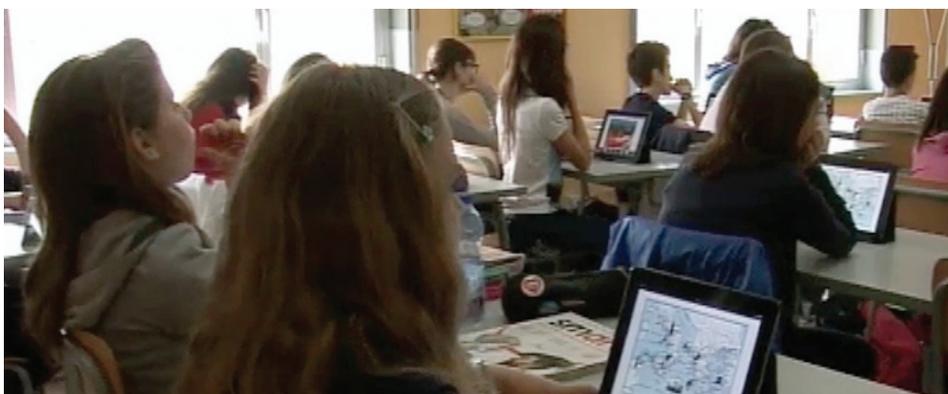
133 learners aged 11–16 were asked about the project in February 2013:

- 98% liked learning using mobile devices
- 92% liked learning their particular subject (English, Maths, Science or Italian) using mobile devices
- they suggested expanding to using mobile devices in Art, Religion, Spanish and Music.

Teachers' responses:

12 teachers in Caltanissetta were asked to indicate their enthusiasm for *educ@Tion* on a scale of 1 to 5 (1 being low and 5 high):

- 8% rated it 3 (1 teacher)
- 75% rated it 4 (9 teachers)
- 17% rated it 5 (2 teachers).



Lessons learned

- **Digital content:** In Italy digital school ebooks are currently only available to students via protected file (DRM license), which means they can only be read on a single device using a single application. *educ@Tion* cannot yet offer collaborative functionalities on DRM-licensed digital ebooks, so DRM support is an important key feature that should be added in order to allow collaborative school works, integration with self-produced or internet-downloaded content, also on protected content.
- **Learning communities:** Encouraging capitalisation on ICT didactic experiences, exchange of self-developed contents and sharing of digital didactic strategies and 'best practice' are key to moving schools from a trial phase to a systematic approach and adoption of ICT.
- **Teacher training and support:** Teachers need a support programme to help them use ICT and technology effectively for didactic purposes, moving away from their traditional role and approaches.
- **Active management commitment is crucial** when making changes to pedagogy in schools.
- The activities offered alongside the trial (such as workshops, a TILab trip to Turin laboratories and a competition for redesign of the software interface) contributed to the success of the student involvement.

What next?

Telecom Italia is extending *educ@Tion* to provide special support to students with learning disabilities (eg dyslexia, disgraphia, etc). The goal is not a retail solution for these students, but a complete and integrated solution for all students, including a useful level of personalisation, in order to achieve real school inclusion.

TILab has just started a financed project with a school education publisher (Edizioni Centro Studi Erickson), two small training companies (MeMeTic and Forteam Studio) and the local government of Provincia Autonoma di Trento to research this new education model and design technologies and software to support it, including new digital books and augmented reading to help full transition from paper to digital. It is expected to provide important feedback on the growth of *educ@Tion* and the business model.

Telecom Italia is looking at collaborating in the future with editors and multimedia didactic content providers to design a more effective and complete offer, complementing the current commercial offer for schools.

With the support of GSMA they are also running an evaluation programme of the strategic school trials for the school year 2012/13, to highlight how *educ@Tion* can evolve to be better integrated into teaching and learning activities.

Publications

For an article (in Italian) describing educ@Tion see:

www.telecomitalia.com/content/dam/telecomitalia/it/archivio/documenti/Innovazione/NotiziarioTecnico/2011/n3-2011/capitolo03.pdf

A paper in English describing in particular Society@school has been published for the NEM Summit 2012: Society@school: social enhanced reading experiences for education F.L. Mondin, O.R. Rocha, M. Belluati, E.A.M. Guercio

For a description (in English) of educ@Tion and its pilot in Italian schools see: Chiozzi, Giovanna and Giovanni Nassi. 'Strategic Trials of educ@Tion, the Telecom Italia Solution for Cooperative Digital Learning' In *Handbook of Research on Didactic Strategies and Technologies for Education: Incorporating Advancements*

(2 volumes), ed. Paolo M. Pumilia-Gnarini, Elena Favaron, Elena Pacetti, Jonathan Bishop and Luigi Guerra, pp117-128 (2013), accessed January 22, 2013. doi: 10.4018/978-1-4666-2122-0.ch011 Available at: www.igi-global.com/

For more information contact:

Maurizio Belluati,
Telecom Italia – Innovation & Industrial Relations, Research and Prototyping
maurizio.belluati@telecomitalia.it

Giovanna Chiozzi,
Telecom Italia - TILab and Global Consulting, Service Platforms and Technology Evolution
giovanna.chiozzi@telecomitalia.it

Giovanni Nassi,
Telecom Italia - TILab and Global Consulting, Service Platforms and Technology Evolution
giovanni.nassi@telecomitalia.it

About the GSMA Connected Living programme

Connected Living is a market development initiative whose mission is to help mobile operators accelerate the delivery of new connected devices and services. Our target is to assist in the creation of 700 million new mobile connections, whilst stimulating a number of service trials and launches in the Automotive, Education and Healthcare sectors. The Connected Living programme is also working with the city of Barcelona, the Mobile World Capital, to develop and showcase smart city services. We are working in mEducation to help bring the operator and education industries together to address market barriers, foster collaboration and speed up the adoption of mobile education services.

For further information please contact us at meducation@gsma.com or visit www.gsma.com



Connected Living