

PORTUGAL [3] - 2012

EDUSCRATCH

A. BASIC INFORMATION

Country:	Portugal
Title of initiative:	EduScratch
Coordinator/ Organization:	<ul style="list-style-type: none"> · Miguel Figueiredo and Teresa Marques · School of Education · Setúbal Polytechnic Institute ICT Competence Centre
Key competences addressed:	<p>Main focus: [PT] <i>Competência digital</i> [EN] Digital competence;</p> <p>Secondary focus: [PT] <i>Competência matemática e competências básicas em ciências e tecnologia</i> [EN] Mathematical Competence and Basic Competence in Science and Technology</p>
Type of initiative and channels used for implementation (e.g. curriculum reform introduced through legislation etc.)	<p>This initiative aims to promote the educational use of the programming language Scratch by supporting, teaching and sharing good practice among members of the Portuguese educational community.</p> <p>It contributes to the curricular integration of ICT as well as giving context to the implementation of ICT curricular targets in grades 7 and 8 (ages 12-13).</p> <p>The initiative has been implemented by the Directorate General for Education in partnership with the Portuguese Ministry of Education and Science and one of its ICT Competence Centres.</p>
Partners:	<ul style="list-style-type: none"> · Directorate General of Education (DGE) · Ministry of Education and Science · School of Education: Setúbal Polytechnic Institute · Sapo Portal (Portugal Telecom)
Scope: (student/teacher/school level; local/regional/national)	<p>Teachers and students</p> <p>National</p> <p>School support at a regional level</p>
Learning context: (formal or non-formal)	Mainly formal (although some of the activities occur in non-formal contexts within the school)
School education level/s: (primary, lower secondary, upper secondary)	Pre-school to lower secondary level.

Target groups:	All curriculum areas and all students (special needs students, including overachievers)
Time frame: (start and end date)	September 2010 – on-going
Relevant links:	<ul style="list-style-type: none">· EduScratch Portal: http://eduscratch.dgicd.min-edu.pt/· ICT Competence Centre website: http://projectos.ese.ips.pt/ctic/· Facebook – EduScratch: https://www.facebook.com/eduscratch· Twitter-Eduscratch: https://twitter.com/eduscratch· ERTE-DGE website: http://www.erte.dge.mec.pt/· SAPO Scratch website: http://kids.sapo.pt/scratch/

B. SUMMARY

The EduScratch initiative was implemented by the Directorate General for Education in partnership with the Portuguese Ministry of Education and Science and one of its ICT Competence Centres. The initiative aims to contribute to the creation and development of a community of practice for teachers around the educational use of Scratch, an intuitive programming tool. This tool allows the development of computational thinking and has proven to have huge potential in developing different types of skills (digital and also subject-specific) in students.

Work on this initiative coincides with curriculum reforms in the Portuguese education system introduced in August 2012. The new curriculum requires the existence of an ICT subject in grades 7 and 8 that includes a target dedicated to the exploration of computational environments. Work carried out within the EduScratch initiative also counts towards corresponding to these new curriculum demands.

C. IN DEPTH INFORMATION

Rationale/contextual background/motivation for introducing the initiative/reform:

For many students imagination and creativity are lost over their 12-year school career. As a consequence, many students do not develop the higher-level skills that enable them to become critical citizens, creators and builders.

Although young people have a close and easy relationship with information and communication technology, they still have a poor use of ICT in learning activities. We therefore decided to promote the use of learning tools such as Scratch to design learning environments which stimulate and motivate students and in which they have an active role. Scratch is a graphic programming environment that allows the user to work with several types of media. Its use is highly intuitive and allows users to create interactive presentations, animations and games, which can also then be shared on the internet.

Scratch was designed at the Massachusetts Institute of Technology as a response to the gap between global technological advancements and citizens' technological fluency. Its creators believe it can contribute to the development of 21st century skills by giving young people the chance to become creators and inventors, fostering an effective and innovative use of ICT in education. Although research suggests that Scratch does have this potential, progress in programming and a more autonomous, consistent and continual use of Scratch by students seem to depend on the form and regularity of teacher mediation (hence the importance of teacher training), an on-going immersion in the learning environment itself, peer work and the constraints placed by the school's modus operandi.

Objectives:

- To promote the use of Scratch in a school environment, contributing towards the integration of ICT in teaching and learning.
- To promote and support the use of Scratch (and knowledge about this tool).
- To support the implementation of the ICT curriculum targets in schools (grades 7 and 8).
- To contribute to the development of competences specified in the national curriculum (by using the Scratch programming language for creating learning activities).

Dimensions targeted by the initiative/reform (e.g. student curriculum, assessment, initial/in-service teacher education, school autonomy etc.):

Curriculum: Curriculum targets for ICT include a specific target (P8) in the Production Domain. It refers to tools and activities used to produce digital content.

From August 2012, the Portuguese curriculum reform requires the existence of an ICT subject (grades 7 and 8) that includes a target (P8 domain - Production) dedicated to the exploration of computational environments (which could include the Scratch programming environment). Work carried out within the EduScratch initiative also counts towards corresponding to these curriculum demands.

In-service training (INSET): In its second year, EduScratch invested in accredited teacher training for teachers at pre-school to lower-secondary level. The training courses aim to promote Scratch activities in mathematics, with connections to other subjects in pre-school and primary education.

School Autonomy: Within the context of School Autonomy Contracts, students can be provided with extracurricular activities (namely through Club activities with Scratch/ICT in general).

Overall approach (e.g. holistic – existence of an overarching strategy, or targeted approach focusing on a specific dimension etc.):

Work carried out so far on this project has been integrated into the various activities of the ICT Competence Centre within the context of the abovementioned partnership. This is part of an overall strategy of dissemination and support of the use of ICT in schools.

Detailed explanation of the key competence/s concerned:

Digital Competence: With Scratch, students learn to use computers and to communicate through them as well as to build digital artefacts using computational thinking.

This tool can be used to promote computer use for research, storage, production, sharing, presentation and information assessment. It can also be used to communicate and participate in collaborative networks via the internet.

By creating interactive stories, games and animations with Scratch, young people can learn important concepts and skills not only about computers but also about any other knowledge area.

Specific subjects concerned or cross-curricular approach:

Scratch promotes a trans-disciplinary approach and can be used in any curriculum area. It has a large impact particularly among special needs students.

How the initiative/reform is being implemented (e.g. process followed, political commitment, consultation with stakeholders and their respective roles, incentives for stakeholders, dedicated funding, teaching material, definition of goals and standards, assessment and evaluation mechanisms, impact on teacher training/professional development and school practices/leadership, scaling-up approach, based on research/evidence? etc.):

- Development of a community of practice for educators/teachers regarding the educational use of Scratch: <http://eduscratch.dgidec.min-edu.pt>
- Teacher training;
- Production of teaching materials;
- Support for schools in the implementation of activities in their classroom;
- Dissemination (Portal, ICT Competence Centre website and Facebook page);
- Searching for relevant research;
- Evaluation of the impact of activities.

No specific research has yet been carried out on this initiative. However, one of the main promoters has developed a study within the context of her Master's thesis:

Marques, T. M. (2009). *Recuperar o engenho a partir da necessidade, com recurso às tecnologias educativas: Contributo do ambiente gráfico de programação Scratch em contexto formal de aprendizagem*. Tese apresentada à Faculdade de Psicologia e Ciências da Educação da Universidade de Lisboa para obtenção do Grau de Mestre em Ciências da Educação (Tecnologias Educativas). Available at <http://repositorio.ul.pt/handle/10451/847>

Present stage/phase of implementation:

Following the creation of the community of practice for educators/teachers, priority has been given to its further development. The community aims to create and share resources, as well as to provide both formal and informal teacher training and support for schools. Its main objective is to increase the number of users, experiences and examples of good practice.

Pedagogical issues (issues related to how key competences are being taught to students and how are teachers being prepared to teach them):

- Dissemination of best practice, sharing of resources;
- Dissemination through workshops;
- Providing teacher training with a strong practical emphasis.

Resource sharing and teacher training and support seek to ensure the gradual empowerment of teachers involved. The aim of this is to change classroom practices so that the student becomes the centre of his/her own learning process by developing key competences. This initiative intends to promote a holistic and integrated approach to the curriculum rather than a compartmentalised one that does not reinforce the development of key competences. Teachers working with greater consistency and regularity are now able to move forward with this type of activity, but they need on-going support in order to improve their methodologies and assess the impact of their practices, and to share their knowledge and experience with peers in order to expand the scope of the EduScratch project.

What works well (to identify enablers):

- Certified Teacher training sessions (where teachers have to use Scratch in their classroom and report their experiences);
- Direct support to schools (teachers and students) in the classroom;
- Sharing among peers (from the same school), which motivates other teachers to experiment with using Scratch;
- Students supporting other students and teachers (showcasing successful experiences).

Challenges and how these are being addressed (to identify obstacles and solutions):

- Many schools (especially kindergarten and primary schools) do not have enough computers to be able to carry out such activities in a continuous and systematic way with a large number of students. In the specific case of one school, whose teachers were trained in the use of Scratch and intended to actively develop projects with their students, this issue was addressed by recycling some computers from the 1:1 initiative Magalhães. Such an initiative could be extended to other settings/schools.
- Teachers of lower and upper secondary students in particular find it difficult to manage the curriculum and to integrate this type of activity into the classroom. The use of programming languages such as Scratch started to be piloted in August 2012 in grade 7 and 8 ICT lessons. Other trans-curricular areas such as Civics Education, “Study Support” and “Project Area” (a trans-curricular subject where students are engaged in activities and projects across the curriculum) are no longer part of the curriculum in grades 5 to 9. Under these circumstances and given the fact that ICT is now being taught in years 7 and 8 as a curriculum subject, the strategy is to teach Scratch as part of this subject.
- Teachers may also use Scratch in curricular activities within other subjects.
- Teachers lack skills on the management of these tools in the classroom.
- Informal training (1.5 to 3 hour workshops) seem to motivate fewer users. This is being addressed by providing CPD workshops aimed at teachers from different curricular areas.

Monitoring & evaluation so far/planned, and which methods are being used (e.g. internal/external quality assurance, inspection, national assessments, international tests, self-evaluation, formative or summative evaluations):

So far, data monitoring and evaluation have been part of the ICT Competence Centre self assessment process (periodic activity reports). This monitoring is supported by evidence gathered by the ICT Competence Centre during the training courses (formal, certified, or informal) and schools that are developing activities with Scratch.

In future, this evaluation will be carried out in a more systematic way, supported by research methodologies, which are currently being defined.

Impact (e.g. any planned impact assessment?):

The impact of the initiative is mainly evaluated in a qualitative way regarding good practice being shared. The number of schools, teachers and students involved in each activity in each school term (September-December, January-April and May-August) is registered and compared but no prior targets were established.

Participation rates during the activities of the last school year were as follows: 630 teachers from 385 schools with a total of 2278 students.

Communication of the initiative/dissemination of outputs and activities:

- EduScratch Portal: <http://eduscratch.dgicd.min-edu.pt/>
- ICT Competence Centre website: <http://projectos.ese.ips.pt/cctic/>
- Facebook – EduScratch: <https://www.facebook.com/eduscratch>
- Twitter-EduScratch: <https://twitter.com/eduscratch>
- ERTE-DGE website: <http://www.erte.dge.mec.pt/>
- SAPO Scratch website: <http://kids.sapo.pt/scratch/>

Next steps/follow-up:

- To ensure an on-going investment in teacher training, taking into account 8th grade ICT curricular targets, (Production, P8 - Explore computing environments);
- To prepare for the continuity of the project ensuring DGE support with the establishment of medium/long term goals;
- To increase the number of staff involved in the implementation of the project, and to involve the remaining ICT Competence centres.

Additional information:

The references listed below are helpful for providing an understanding of the potential of Scratch as a tool for competence development:

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- Information Technology Report: Readiness for the Networked World. Oxford: Oxford University Press. pp. 32-37 Available at <http://ilk.media.mit.edu/papers/mres-wef.pdf>
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- Resnick, M. (2003). Playful Learning and Creative Societies. Education Update online. February 2003. Available at http://www.educationupdate.com/archives/2003/febo3/issue/child_playfullrng.html
- Resnick, M. (2007a). Sowing the Seeds for a more creative society. Learning and Leading with Technology, International Society for Technology in Education (ISTE), December/January 2007-08 (pp. 18-22). Available at <http://web.media.mit.edu/~mres/papers/Learning-Leading-final.pdf>
- Resnick, M. (2012). Reviving Papert's Dream. Educational Technology, vol. 52, no. 4, pp. 42-46. Available at <http://web.media.mit.edu/~mres/papers/educational-technology-2012.pdf>
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