

STENCIL case study Report

A. The Case Study in relation to the institution

1. Introduction

The Greek INSTEM case study concerns the “Science Teaching European Network for Creativity and Innovation in Learning” (STENCIL) Network and more specifically the content and impact of the project on its target group(s) with particular focus at the local / regional level.

STENCIL (510177-LLP-1-2010-1-IT-COMENIUS-CNW) –coordinated by Amitié srl Bologna, was a LLL COMENIUS project that started January 2011 and ended December 2013. In the Network participated 21 organizations (from 9 European countries) that worked together to provide science teaching expertise, innovative methodologies and creative solutions to STEM teachers in order to make science more attractive to students.

The INSTEM partner (FORTH) reporting on the case study was a major partner to the project under discussion as it was responsible for “Good practices identification” and the development of the three Annual Reports on the State of Innovation in Science Education (http://www.stencilscience.eu/annual_reports.php).

The rationale for selecting STENCIL as the INSTEM case study is founded mainly on the impact it has on the local / regional level

- its outputs (good practices) are used as springboard for a seminar organized by the Physical Science counsellor of Western Crete
- Greek science teachers showed a relatively high interest in submitting initiatives in the project’s last Call

but also because it

- facilitated visibility of innovative teacher practices to schools and institutions involved in Comenius and other European funded projects and fostered transfer of good practices
- provided INSTEM with vast experience on innovation in science education and a large network, being one of the 32 COMENIUS projects with which INSTEM is linked with, and
- is it associated to INSTEM as its coordinating institution is an Associate partner.

2. Background on STENCIL

The STENCIL Network offered a platform of joint reflection and European cooperation to science teachers, schools, school leaders, policy makers and practitioners in science education. The project identified innovative science teaching methods and practices at a national and European level –used positive results from the former EU projects STELLA and GRID, enriched the *European Online Catalogue of Science Education Initiatives* (established by GRID project) and published three *Annual Reports on the State of*

Innovation in Science Education, the *STENCIL Guidelines* and *Manifesto for teaching and learning science in creative ways*.

The project offered to diverse actors in science education –teachers, school managers, teacher trainers, school authorities, policy makers, science museums operators, coordinators and members of EU funded projects, from all over Europe, opportunities to meet, exchange, learn from each other, disseminate results and jointly reflect on innovative and creative teaching and learning methods. It also fostered the *transfer of good practices* by organizing several study visits, workshops and international conferences in the partner countries as well as by inviting teachers, educators and all professionals to submit their science education initiatives to the *Calls for Participants*.

More specifically the STENCIL Network:

- identified, evaluated and promoted innovative practices in science teaching, by publishing three Annual Reports on the State of Innovation in Science Education;
- provided educational authorities and policy makers with a set of Guidelines and a Manifesto for innovating science education;
- disseminated materials and outcomes from previous EU funded projects, but also from isolated science education initiatives, through the its web portal and events;
- brought together science education practitioners who shared different experiences and learnt from each through the organization of study visits and workshops, using a peer to peer approach;
- involved teachers, schools and all science education practitioners in a fruitful exchange of ideas and practices by
 - publishing their science education projects to the European online Catalogue and/or searching for initiatives within different subjects from other schools and countries
 - submitting initiatives to the Calls for Participants
 - attending the STENCIL events or going through the multimedia documentation available on line

The STENCIL Network represented different points of view on education as it included public and academic research institutes and organizations, science museums, educational authorities and schools, from different countries. The project aimed at contributing to the *improvement of science teaching*, together with the *modernization of pedagogical methods*, the *promotion of partnerships* between schools, universities and industry and the *improvement of female participation* in STEM studies and careers.

All partners cooperated in order to identify, evaluate and promote *innovative practices in science teaching* from their countries and to *build a community of science education practitioners* sharing science education experiences and methodologies at national and European level. Besides making visible the STENCIL results, they also disseminated relevant projects and experiences in science education from other countries and at European level.

STENCIL efforts were directed towards *promoting a European dimension* in science teaching and contributing to *linking with other projects* in order to overcome the prevalent notion of isolated projects. STENCIL provided teachers and schools with a “picture window” on science education in Europe, giving

them the opportunity to open the classroom and casting a glance out of the school walls, as important step for reflecting and innovating their consolidated ways of teaching.

Convergence of STENCIL with the activity of the ERE Group

The scope of activity of the ERE Group of IACM/FORTH is on knowledge management on/for science education. To this effect the Group tests products and processes in order to on the one hand develop understanding on “good teaching / learning” process and on the other to contextualize these in the framework of the educational processes implied by the Greek system of education. STENCIL provided the opportunity to the ERE Group to

- promote innovation and good practices in science education
- share the knowledge gained with other science education projects
- enhance its cooperation with local / regional school actors

3. Impact produced

The impact mainly affects the knowledge base of science teachers on teaching methods for effective science learning. This is manifested through STENCIL’s main outcomes, those being:

The ***European Online Catalogue of Science Education Initiatives*** which includes more than 1200 initiatives on different science education subjects, from different countries and schools (part of the initiatives originate from the former STELLA and GRID projects). These initiatives were directly submitted by teachers and schools from all over Europe. The STENCIL Catalogue offered to teachers and all persons interested in science education the possibility to publish their science education projects and to get inspired by searching for initiatives within different subjects from other schools and countries. Many initiatives include a documentation section through which is possible to *download materials and documents*.

The **Annual Report n.1, 2 and 3** titled “**Enhancing Innovation and Creativity in Science Teaching**” illustrating science education policies, trends and innovative practices.

The analysis of results and information collected, the comparison of the data with that included in the European Catalogue of Science Education Initiatives and in the Annual Reports identified critical issues in the implementation of good practices and in bridging the “gap” between expectations and everyday school practice. These lead to a series of recommendations for stakeholders and policy makers on future initiatives and actions, which have been included in the STENCIL Guidelines and Manifesto.

The **Guidelines for teaching and learning science in creative ways** providing all relevant actors in science education, at all school levels with a set of recommendations on how to achieve innovation and creativity in teaching, starting from the analysis of the way science teaching and learning innovation is improved and perceived in the European schools.

The **Manifesto for teaching and learning science in creative ways** –available in 9 languages, presenting in a short and visual way 5 recommendations for Teaching and Learning Science in creative ways (derived from the Guidelines).

The **Multimedia documentation of all study visits, workshops and conferences** organized by the project – includes videos, photos and supporting documents that illustrate good and innovative practices in science education.

The ***Calls for Participants*** –launched in 2012 and 2013, represented a driving tool for the involvement of the educational sector. More than 100 initiatives were submitted by schools, teachers and professionals in science education. Teachers / institutions that represented the winning initiatives could choose between two prizes: materials / tools to be used in science education activities with pupils and students or a grant covering the cost for the participation in the STENCIL conferences and present their work to an international audience. These prizes were selected with the *aim to have a lasting impact on the school*, either in terms of materials and resources available for in class activities or in terms of networking opportunities.

Apart from enhancing the knowledge base STENCIL facilitated the emergence of personally produced innovation for practitioners through its project results “European Online Catalogue of Science Education Initiatives” and the “Calls for Participants”.

It has to be stated that although the project ended in 2013 the “Catalogue” continuous to be used at least from a group of Greek teachers (please see below).

4. Level of institutional change

STENCIL was instrumental in enhancing and expanding ERE Group’s cooperation with local / regional school actors. Greek teachers mainly in Western Crete were –and still are, keen in exploring the available material and to prepare and upload their own work.

The two main factors that facilitated teachers’ involvement were

- a) *awareness development* as the type of initiatives that are included in the “European Online Catalogue of Science Education Initiatives” were considered by practitioners to be teacher oriented, rather easy to search, concrete examples based that can be adapted to their needs and allowed sharing of their work with other colleagues
- b) *recognition of teacher activity* as the Greek initiative that was submitted in the 2012 Call for Participants was among the winning ones. The teacher decided to attend the STENCIL international conference together with 2 students. All were very enthusiastic from their study visit to a science center and their participation in the Conference. Their experience served as a motivation to the local environment.

It has to be stated that another factor that enhanced the acceptance of the project activity to the teachers’ community was that of linguistic adaptation as most of the STENCIL web portal has been translated to Greek.

Overall STENCIL proved to be a rewarding project for teachers –one that they consider having direct relation to them. On such a base teachers are now more willing to be informed for other science projects ERE Group participates in. This outcome gives the Group a competitive advantage in Science education related projects as the target group is easily accessible to discuss and engage in innovation processes.

B. STENCIL's impact on the local level

1. Short term

As stated above STENCIL was a motivating project especially for Western Crete teachers. This is to a great extent due to the enthusiasm of the Physical Science counsellor of Western Crete who considered that project outcomes could motivate teachers of her region to search for innovative practices and to introduce new ideas/elements in their teaching.

The STENCIL 2013 Call for Participants served as a starting point for teachers working with good practices and participating in a specifically designed *educational –training Seminar on “Good Practices for science teaching based on STENCIL science project”* that started in May 2013 and ended in June 2014. Twenty one (21) teachers from Chania region participated on a voluntary base in five (5) face-to-face meeting and three (3) teachers from Rethymnon followed the seminar through skype, e-mails and telephone conversations.

In the first meeting the counsellor presented the project and its website and asked teachers to search for innovative online practices available. Then communicated to the teachers the Call for Proposals and urged them to participate, highlighting the chance to post their work / initiatives to an open community that facilitates sharing of innovative practices. Ten (10) teachers uploaded more than 12 initiatives in the Catalogue and responded to the Call.

In the other four (4) meetings teachers discussed in teams

- aims and objectives of science teaching based on inquiry
- what is “good practice”
- how it can be designed, implemented and evaluated
- examples from STENCIL

In this period the participating teachers navigated through the STENCIL Catalogue, exchanged ideas and then designed their own “educational activities”. These activities were implemented and evaluated in their respective classrooms. To decide if teachers “educational activities” are considered “good practices” the STENCIL criteria were used. Five (5) teachers presented their work and all discussed in the face-to-face meetings the experience gained and evaluation results.

Teachers work has been presented in different teachers’ meeting, workshops and conferences. Also they are investigating the possibility to upload their work in a running science education project. Teachers reported that through this seminar they upgraded their skills and knowledge and at the same time utilized knowledge produced at the European level.

2. Long term

The long term impact of STENCIL into the local level can be addressed in terms of

a. Contribution to the change in the curriculum structure

Practitioners' involvement in STENCIL related activities gave them the confidence that sharing and discussing teacher driven innovative practices in science education is an attainable goal. It seems that they question the prevailing attitude "wait for ready-made material that can be used in classroom" and feel more confident in adapting, elaborating and localizing existing material. This creates some space to support and incorporate needed curriculum changes.

b. Teachers' training

The project as stated above served as a transfer of innovation project to the local level. This generated interest on innovative teaching approaches and classroom practices and as such has made teachers more aware and more demanding on the type of teacher training these receive / require.

C. Contribution of STENCIL to INSTEM

STENCIL contributes to INSTEM in multiple ways. Having as common aim the improvement of science education and sharing the view that knowledge should be shared across projects and sustainable structures are needed STENCIL's coordinating institution became an INSTEM Associate partner. Also STENCIL being one of the 32 COMENIUS projects with which INSTEM is linked with, provides INSTEM with its rich experience on innovation in science education.

As already stated above, teachers regard the STENCIL project as one that is relevant to their needs, fostering transfer of good practices and at the same time allowing them to publish their work. As a result they can see EU funded projects as something more relevant to them and thus they are more willing to be informed for other science projects and their results.

This attitude facilitated the organization of the INSTEM national workshop in that teachers were eager to participate and contributed to a fruitful discussion. In has to be mentioned that they referred several times to STENCIL as an example of a project that was meaningful for them. The regional network of teachers is also enhanced by these teachers: having a positive view of STENCIL they are more "open" to explore the potential INSTEM can offer to them.

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