

## Goerudio: Innovative Teaching Methodologies in Science Education

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### Abstract

*The project identifies two common challenges that the European educational and training systems are facing and that need a common effort in order to be answered to:*

- *the lack of motivation of secondary and vocational education students in studying scientific related topics, and the related insufficient results that they achieve during their school curricula*
- *the lack of capacity of teachers and trainers in updating their teaching methods in order to promote the interest of their students toward scientific issues*

*The project created a learning community of European teachers and students in order to carry out a common reflection on how to make scientific issues more attractive, promote the capacity of learners to be managers of their own learning process, exploit and mainstream the more effective projects and experiences available at European level in the field*

*The Goerudio portal already offers the access to:*

- *A collection of teachers and students' experiences: The experiences give an accurate description of the problems encountered by the science teachers and the related solution applied. Teachers collected the students' experiences related to the students' successes and difficulties to study scientific subjects. The experiences also present the motivation for the success or the difficulty.*
- *A database of project and initiatives for science education: The database is a collection of previous and current projects and initiatives focusing on the promotion of innovative practices for teaching scientific subjects. The database gives the access to online courses, teaching methodologies, learning games in order to provide science teachers with innovative didactic resources to promote students' interest towards scientific subjects.*

*Teachers, supported by project partners, are currently creating their teaching resources to teach scientific subjects making use of the results of previous innovative initiatives.*

### Context

European educational systems are facing two common challenges:

- The lack of motivation of secondary and vocational education students in studying scientific related topics
- The difficulties for school teachers in updating their teaching methods in order to promote the interest of their students toward scientific issues

In this context the European Commission has financed the "Goerudio" project in the framework of the Lifelong Learning Programme (KA4 Dissemination and Exploitation of Results, and Exchange of Good Practice).

### Objectives

The aim of the project is to create a learning community of European teachers and students in order to carry out a common analysis and reflection on the theme of how making scientific issues more attractive to students. The learning community has also the aim to exploit and mainstream the more effective projects and experiences available at European level in the field.

This general is achieved through these specific objectives:



- Promoting the mutual comprehension between teachers and students that will share and match their everyday experiences in dealing with the teaching and learning of scientific issues, to understand what are the main obstacles that affect a correct and effective transfer and acquisition of knowledge in scientific matters.
- Enhancing the interest and stimulate the active learning process of pupils of all educational levels, concerning scientific issues, by sharing and exploiting the most effective experiences that promote an enquiry based, interactive and amusing approach to the understanding of science.
- Create a Network among teachers and students of different European countries and institutions for the exchange and comparison of experiences and knowledge in order to develop and exploit a new approach to science teaching and learning.

## Target Groups

46 schools were officially involved in the project and are now listed in the database. Within them 146 teachers, 46 school directors, 1.729 students have been identified by the project partners.

The contact teacher for each school involved has filled in a common presentation form and the project partners have uploaded it on the project portal.

Please refer to the Schools section of the Goerudio Portal (<http://goerudio.pixel-online.org/schools.php>).

For each school, a web page with the main information is available.



## Project Results

The project foresees four main activities.

### 1 Collection of teaching and learning experiences

The Databases of teachers and students' experiences are available on the Goerudio portal under the link **Experiences / Teachers Experiences** ([http://goerudio.pixel-online.org/experiences\\_teach.php](http://goerudio.pixel-online.org/experiences_teach.php)) and **Experiences / Students Experiences** ([http://goerudio.pixel-online.org/experiences\\_stud.php](http://goerudio.pixel-online.org/experiences_stud.php)).



Each teacher experience has been described according to the common format approved during the kick off meeting. The experiences are organized in 2 searchable databases. Each teacher's experience presents educational issues and problems they have faced together with the solution applied to increase students' motivation to study scientific subjects. Each student experience presents a difficulty or a

success in studying scientific subject. All the experiences are available in English and in the national language.

The databases of experiences appear well structured and effective in terms of end users' accessibility, with an easy to use research engine allowing researches according to different parameters (thematic area, country, school typology, language of description and free text in the title). Each experience



foresees a wide description.

On the databases, 375 teachers' experiences and 815 students' experiences are available.

## 2 Assessment of projects and initiatives in the field of science education

The partners identified, described and uploaded on the project portal projects and initiatives related to science education. The initiatives have been identified through the project compendia and the Adam database. Partners also carried Internet researches to identify initiatives promoted at national level. The initiatives have been then reviewed by the partners and then assigned to the teachers at national level so that they could test them with their students and report their feedback.

The Database of reviews and initiatives is available at <http://goerudio.pixel-online.org/rel-initiatives.php> under the link **Relevant Initiatives**.

The selected initiatives:

- Take into consideration several types of products: online courses, teaching methodologies, video, online games, etc
- Focus on science subjects: chemistry, maths, physics, biology, science, etc.
- Are available in English and in all partners' languages

The initiatives have been reviewed and presented according to a common format.

The reviews of the initiatives have been produced in English and in the national language of the partners. The double version of the language facilitates the use of the resources by the target groups.

The reviews of the selected initiatives are organized in a searchable database which can be filtered by: target group, thematic area, type of deliverable, language of the review, language of the deliverable.



A total number of 219 initiatives are available on the portal and they have been reviewed by partners, teachers and students.

## 3 Learning Community

The aim of this activity is to promote the creation of a learning community in which teachers and students will have the opportunity discuss and share knowledge and experiences on the theme of how to make scientific issues more attractive for students.

The transnational discussion between teachers from all partners countries aim at sharing opinions, teaching methodologies, difficulties in the teaching process and related solutions.

The transnational discussion already took place on the section dedicated to the teachers' experiences where all teachers had the possibility to read, analyse and post a comment on their colleagues' experiences. All teachers involved in the project, in fact, once logged in their username and password had the possibility to access a special blackboard and to share their opinion.

A virtual meeting ([http://goerudio.pixel-online.org/virtual-meeting\\_01.php](http://goerudio.pixel-online.org/virtual-meeting_01.php)) has also been organized involving all partners and at least one teacher from each country. The teacher acted as a spoke person for the other teachers at national level. The virtual meeting gave the opportunity to discuss the results of the transnational discussion on the teachers' experiences and to carry out a comparative analysis at European level.

## Future Activities



During the second year of the project the members of the network will work together on:

- The production of educational resources such as lesson plans, educational models and didactical resources
- The organisation of seminars where students and science teachers will present the results of the Goerudio project.

## References

[1] <http://goerudio.pixel-online.org/>

