Funding agency

SEVENTH FRAMEWORK PROGRAMME

ACTIVITY 5.2.2 Young People and Science

Science in Society

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CoReflect is a three-year (2008-2011) research and development project funded by the FP7 program *Science in Society* (contract no. 217792). There are three main goals at the project level:

- To develop and empirically validate a web-based collection of innovative, inquiry-based learning environments.
- To establish and study a model for the development of sustainable inquiry digital curricula, involving researchers, scientists, and practicing teachers.
- To explore the adaptation process through which best practices can be adapted and transferred from one national or cultural context to another.

CoReflect

Digital support for Inquiry, Collaboration, and Reflection on Socio-Scientific Debates

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Kristianstad University, Sweden

Leibniz University of Hannover, Germany

University of Thessaly, Greece

The Association for Science Education, UK

If you are a teacher interested in enacting one of the learning environments please contact us. Visit the CoReflect website (www.coreflect.org) or send us email for more information.

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Digital support for Inquiry, Collaboration, and Reflection on Socio-Scientific Debates

Research and Development Program

http://www.coreflect.org

Science can be seen as a methodical attempt to increase human understanding about the natural world. Knowledge about the world can empower individuals and can help them participate in modern-day socio-scientific debates. The resolution of such debates will eventually have an impact on everyday human life.

The FP7 project "Digital Support for Inquiry, Collaboration, and Reflection on Socio-scientific Debates" (CoReflect) seeks to explore mechanisms for addressing some of the local problems in science education today, and is examining the transfer of empirically-validated successful practices to other contexts.

Inquiry, Collaboration and Reflection: The CoReflect project

Problem Statement

♦ European students show a declining interest in science education.

♦ There is an urgent need to reform science education in Europe

♦ Reforming science education is a complex task as many variables are at play simultaneously.

Some of the reform implementation problems targeted by CoReflect are:

- ♦ The lack of customizable, inquiry-based innovative teaching materials at European level.
- ♦ "Lethal mutations" -that is, reform documents that are incorrectly used by teachers and teacher-student needs that are not properly understood by researchers.
- ♦ The development and validation of research-based inquiry curricula.
- ♦ Mechanisms for participatory curriculum design, through the method of Local Working Groups.
- ♦ How to transfer science education best practices from one cultural context to another.

Seven inquiry-based learning environments are currently being developed by each Local Working Group on the following topics:

- ♦ Biotechnology
- ♦ Global Warming
- ♦ Nicotine Addiction
- ♦ Sustainable development
- ♦ Fog and Humans
- ♦ Ethical and scientific issues in astrobiology
- ♦ Water quality and human activity

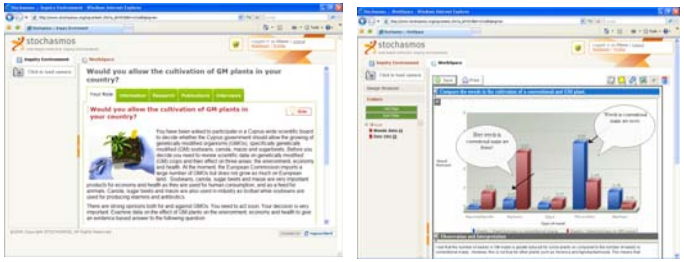
Inquiry

♦ Each of the web-based topics is presented to the students through problem-based learning, using a driving question to guide their investigation and a scenario.

♦ The inquiry-based learning environments are hosted on the STOCHASMOS (Kyza & Constantinou, 2007) learning and teaching platform. STOCHASMOS allows teachers to author their own web-based materials or customize environments designed by others. The platform is suited to online investigations which include rich data, offering the tools for focusing on evidence-based and explanation-driven inquiry.

♦ The STOCHASMOS students' environment consists of two main areas: the inquiry environment and the WorkSpace. Most of the reflective scaffolding supporting students' reflection-in-action and collaborative work can be found in the STOCHASMOS WorkSpace. STOCHASMOS also offers several tools to support students' online, context-based collaboration and ongoing assessment by the teacher both in the inquiry environment and in the WorkSpace.

♦ Each learning environment is accompanied by a written activity sequence and a teacher's guide.



An a example from one of the web-based CoReflect learning environments on STOCHASMOS: Biotechnology

Learn more about CoReflect at www.coreflect.org

To learn about the STOCHASMOS web-based learning and teaching platform visit www.stochasmos.org

Reflection

♦ One of the unique characteristics of the CoReflect project is the emphasis on integrating reflection in the process of **student inquiry**.

♦ We define reflective inquiry as students' engagement in planning, monitoring, and evaluating their inquiry process and outcomes.

♦ Research has shown that students are challenged when they are asked to take initiative of their own learning process to solve problems.

♦ Reflection-in-action can help students make sense of what they are doing and can, thus, support the development of students' self-regulation.

♦ CoReflect also values reflection as a methodological tool to further our own inquiring into the project processes.

♦ As a result CoReflect is engaged in **action research**, seeking to examine own design efforts in the context of the Local Working Groups.

Collaboration

♦ **Students** work in groups (usually of two or three) in each of the learning environments.

♦ The representational tools of STOCHASMOS support collaborative learning.

♦ Collaboration across groups can be supported by the technological tools: groups can be paired up and share each other's work in the WorkSpace, and provide context-based feedback.

♦ Collaboration also happens at the level of the **Local Working Groups (LWGs)**, which have been paired up to provide detailed comments to each other about their learning environment.

♦ Each learning environment will be implemented twice by each LWG –after rounds of peer-critiquing it will then be implemented by the collaborating Local Working Group.