KEY ELEMENTS OF THE METAFORA CONCEPT

- From a single, one-time activity (e.g., a discussion) to **a suite of activities** spanning a longer period of time.
- Featuring different **tools** (discussion-supporting/mapping tools, microworlds, etc.).
- From learning to argue, or learning a subject, to **learning to learn**.
- Students are not just given a question to answer but **a full assignment ("challenge") to address**.
- **Students plan their learning activities** and are responsible for the results of their work.
- The plan, created by the students using a special **visual language**, helps them in the accomplishment of their tasks and enables the Metafora system to provide valuable feedback to the students and the teacher.
- Learning domains: **math and science** for 12 to 16-year olds.

PROJECT PARTNERS - METAFORA CONSORTIUM

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- The University of Exeter, UK
- National and Kapodistrian University of Athens – Educational Technology Lab (ETL), Greece
- Katholische Universität Eichstätt-Ingolstadt, Germany
- Saarland University, Center for e-Learning Technology (CeLTech), Germany
- Institute of Education, University of London – London Knowledge Lab (LKL), UK
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metafora

Learning to learn together:
A visual language for social orchestration of educational activities

A Research and Development project co-funded by the European Union under the Information and Communication Technologies (ICT) theme of the 7th Framework Programme for R&D (FP7)

COOPERATION

Strategic objective ICT-5-4.2 – Technology-enhanced learning
STREP – Contract No.: 257872 – Project start: July 2010 – Duration: 36 months

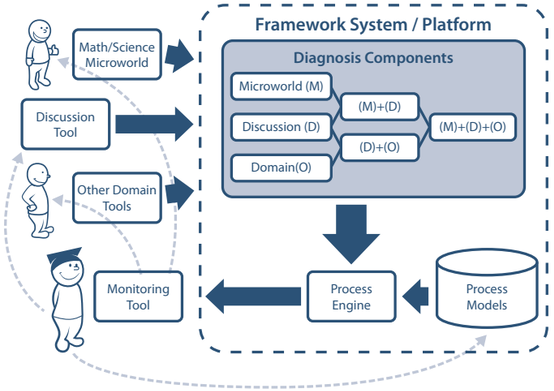
THE METAFORA PROJECT

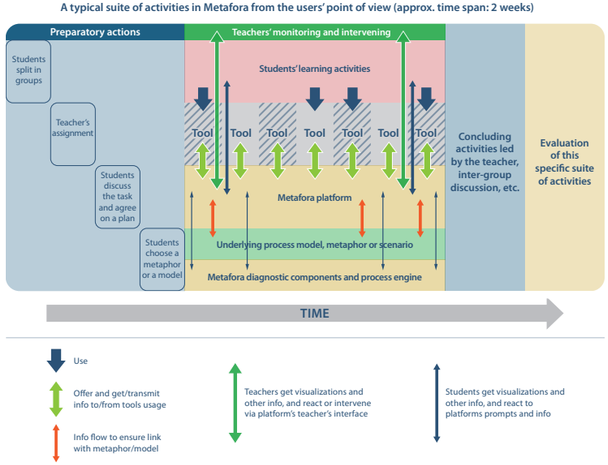
Launched in July 2010, by the end of its 3-year duration the Metafora R&D project will result in the creation of a Computer-Supported Collaborative Learning (CSCL) system to enable 12 to 16-years-old students to learn science and mathematics in an effective and enjoyable way.

The students will, first and foremost, learn to learn, collaboratively addressing an assignment – the "challenge" – posed by the teacher involving a relatively complex problem. Working in groups of 4 to 6 students during a period of 2 to 3 weeks, the students will plan, organize and tackle the challenge by themselves.

The Metafora platform will offer an argumentation and discussion workspace where the students will gather and discuss their findings and arrive at an agreed solution, using also other available tools, such as microworlds and other suitable "domain tools".

The use of a visual language will permit the students to be precise in their planning and then later in enacting the planned activities, while also allowing the system to intelligently track their activities and produce useful information and feedback for both students and teachers.





BACKGROUND AND THE ESSENCE OF METAFORA'S IDEA

The extraordinary success of Web 2.0 social networking technology offers a tantalizing glimpse of **how easily people can organize themselves to work and learn together in online communities**. However, in reality social networking sites are almost totally focused on social exchanges without educational content. Similarly the success with young people of immersive 3D gaming environments illustrates how operating in complex new domains can be fun and engaging, occurring almost naturally as a byproduct of acting in a simulated environment. Currently, however, this powerful technology mostly supports learning in contexts without any real-world relevance. Frequently the learning of skills in games is enhanced not only by the immersive representational media itself but also by individuals collaborating to meet the ends set within the game through developing communication, strategic thinking and problem solving skills. These kinds of skills are precisely those which, in a different context, could help young people **understand scientific and mathematical ideas**.

In Metafora, we will develop tools and pedagogies that bring together the work of two, until now, largely separate strands of educational technology research:

- computer-supported collaborative learning (CSCL) and
- learning through engagement in domain-specific learning environments.

The original contribution to science will come not only from the combination of these two research traditions but also from the recognition that learning how to learn is widely considered as the most important skill for young people to learn, vital for equipping workers and citizens with the ability to adapt and thrive in the fast-changing world.

Building on the success of previous projects that members of the team have worked on, we intend for the Metafora system to help learners reflect on learning mathematics and science as a social process and discover the best ways to structure and engage in learning.

The Metafora system will be technically innovative, linking the most advanced supports for collaborative learning with constructionist and exploratory microworlds. Pedagogically, we will develop an understanding of the affordances of new technology in supporting learning in mathematics and science through dialogue on the construction and exploration of meanings.

THE PROJECT'S OBJECTIVES

The Metafora project proposes **to explore the potential of science and math learning through a visual language to support online groups in designing their own learning together**.
To this end, the specific objectives of the project are:

- to further our understanding of meta-learning within collaborative communities engaged in science and math learning;
- to design a visual language to support students' reflection on their individual and collaborative learning;
- to implement a platform integrating state-of-the-art argumentation tools with exploratory environments;
- to develop an adaptive analytic system utilizing AI techniques to support students and teachers during the collaboration and learning process;
- to design new forms of assessment of the individual and collaborating learning exploiting the diagnostic system.