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## SCIENCE IN 4D: A SUMMER SCHOOL FOR PROMOTING ACTIVE LEARNING IN AN INTERDISCIPLINARY APPROACH

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How to prepare and implement effective in-service teacher training program to promote teachers' professional development? Despite many actions promoted by national and local administrators in order to enhance the quality of science education in the secondary school, the most effective experiences inspired by science educational research remain isolated and find it hard to spread into the classroom practice. Starting from good results obtained in pre-service teachers training by using active learning focused on activities in laboratory, we designed a national summer school in order to answer to the teachers' request of a professional development in disciplinary topics and educational methodologies. Since in our experience the most powerful and interesting teaching/learning processes often involve an interdisciplinary approach, we decide to propose a school whose participants could be any science teacher (i. e. mathematics or physics, chemistry or science teacher in a secondary school). Each edition is focused on a relevant topic in science and can be declined in different and significant ways for every scientific discipline. The unifying theme proposed is broadly speaking a fourth dimension where scientific description of nature is realized. Hence the title of these summer schools became Science in 4D. In first editions the transversal themes were the time, sustainability and the color in nature.

Professional development can provide the opportunities for teachers to learn what they need to know and be able to do as they assist students in the learning process (Bybee & Loucks-Horsley, 2000). Active learning, problem-based learning, collaborative learning and inquiry-based teaching strategies could have a significant impact on science education (Bybee, 2006; Barron, & Darling-Hammond, 2008; Savery, 2006) if teachers used them diffusely. Moreover, in-service teachers have few opportunities of trying and fully acquiring these educational tools in a laboratory environment.

The summer school was designed in such a way that participants were involved in laboratory where they could experience firsthand the effectiveness of these methods in a disciplinary or interdisciplinary context. Since motivation has been recognized as an important factor in the construction of knowledge and the process of conceptual change (Palmer, 2000), an interdisciplinary approach was pursued in Science in 4D summer school. All editions are reported with some examples of disciplinary and interdisciplinary laboratory developed by participants.

### REFERENCES

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**Apply to be considered for a student award (Yes / No)?**

no

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