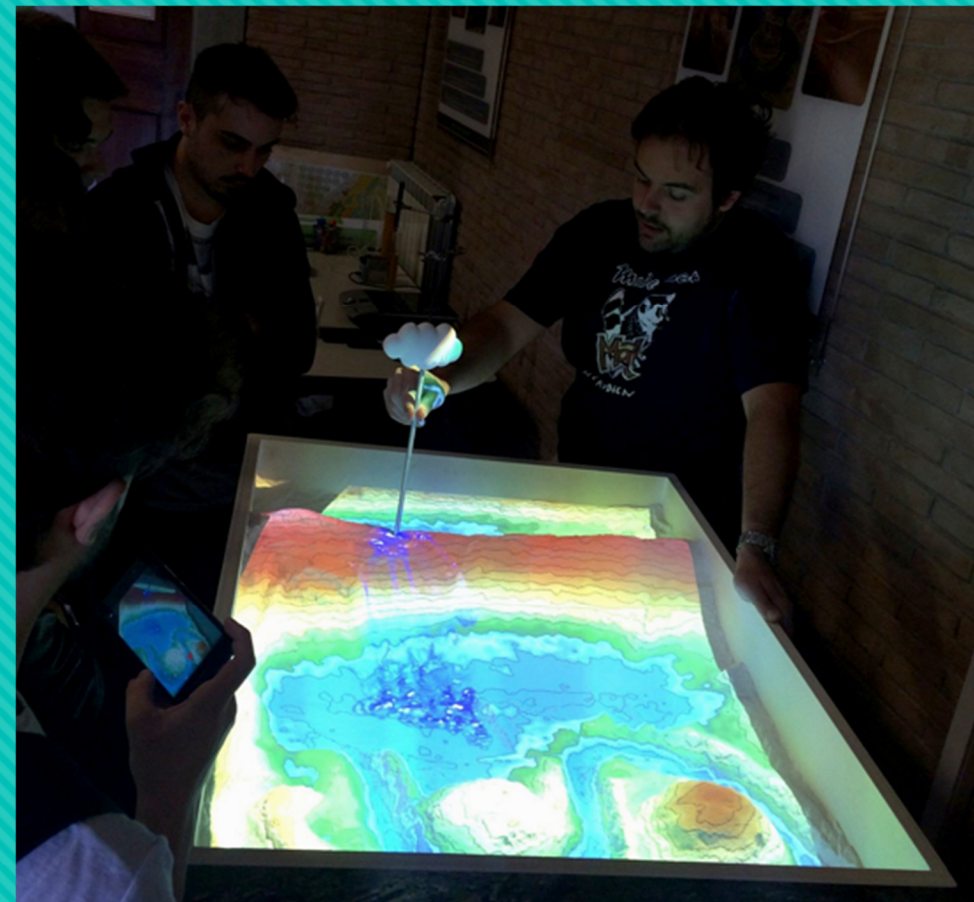


**DEVELOPING NEW APPROACHES AND STRATEGIES FOR TEACHING
PHYSICAL GEOGRAPHY AND GEOMORPHOLOGY:
THE ROLE OF AIGEO (ITALIAN ASSOCIATION OF PHYSICAL
GEOGRAPHY AND GEOMORPHOLOGY)**

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UNIVERSITÀ DEGLI STUDI
DI MILANO

DIPARTIMENTO DI SCIENZE
DELLA TERRA "ARDITO DESIO"

- ✓ The researches carried out by the **AIGeo (Italian Association of Physical Geography and Geomorphology)** members, also in collaboration with other researchers, cover various important topics of the Environmental and Earth Sciences.
- ✓ **Geomorphology** is central, also in the framework of dissemination strategies that are implemented and elaborated.
- ✓ A particular focus is, in fact, addressed to the development of **educational strategies** and **applications** focusing on **landscape evolution through space and time** having as **target** both **students** and **teachers**.



- ✓ In the Italian framework, the **Ministerial National Guidelines** provide indications about teaching these topics in the secondary schools.
- ✓ The guidelines indicate specifically, for the **secondary schools of 2nd level**, the topics and novelties concerning Physical Geography and Geomorphology.
- ✓ Among the general goals referred to the **secondary school of 1st level**, the landscape observation and the related natural phenomena are approached by the Geography teachers and by the Science teachers.



Obiettivi specifici di apprendimento

Liceo classico	Liceo linguistico
Liceo scientifico	Liceo scientifico scienze applicate
Liceo scienze umane	

SCIENZE DELLA TERRA

Primo biennio (primo anno)

- I moti della Terra
- La superficie del pianeta dal punto di vista geomorfologico

Secondo biennio

- Minerali e rocce
- Vulcani e terremoti
- La superficie del pianeta dal punto di vista geodinamico

Quinto anno

- La tettonica delle placche come modello unificante
- Approfondimenti su temi degli anni precedenti

From a document for teachers, edited by Zanichelli Editor available at:
<http://www.zanichelli.it/scuola/insegnanti/cosa-ce-di-nuovo-nei-piani-di-studio/>



- ✓ The proposed strategies include **fieldworks**, **multimedia activities** and **multidisciplinary approaches** addressed mainly to secondary schools.
- ✓ Herein, we present an overview on the AlGeo activities regarding education in Physical Geography and Geomorphology. Some examples of the most recent researches planned and tested for the secondary school (1st and 2nd level) will be outlined. Moreover, the initiatives addressed specifically to present and future teachers will be illustrated too.

The involvement of AlGeo members in educational strategy elaboration, also in collaboration with other researchers, can be grouped in as follows:

- i) creating, designing and planning **educational applications, field and laboratory works, outdoor experiences** successively tested with teachers and students;
- ii) **involvement of students and teachers in organizing** and planning a specific scientific work;
- iii) experimentation of different activities related to specific problems in the frame of **PLS projects**;
- iv) **PhD projects** planning and tutoring;
- v) **dissemination initiatives**;
- vi) **editorial activities**.





Field activities at the geo
DIDALab in the Ivrea municipality,
geoSITLab (Geomorphology,
Geomatics and GIS Laboratory),
University of Turin.



Fieldtrip organized by
University of Milan and
Pavia WG in collaboration
with a secondary school
of 1st level along Trebbia
River, and in Solda Valley

AIGeo/Secondary School coordinated educational projects





The embankment of Ponte Muratori and changes in flow rate of Panaro River: a) during low discharge and b) during a flood.

PLS _ PIANO LAUREE SCIENTIFICHE
The "Geoframe Project" of the Modena-Reggio Emilia University, is a teacher professional development program originated from the collaboration between faculty members from the Department of Chemical and Geological Science (University of Modena and Reggio Emilia) and a group of teachers from different secondary school (2nd level) in the Modena province. Its main goal is to provide high school science teachers with an efficient tool of professional development that meets actual teaching needs but also provides the latest updates in the field of Geosciences.



PLS _ PIANO LAUREE SCIENTIFICHE

"TerraLab Explorer Project", a project carried out by the section of Geology (Department of Physics and Geology) of the University of Perugia for the interdisciplinary laboratory of Geosciences. The laboratory receives students and educators from secondary schools of 2nd level and University. Among the proposed experiments, the geomorphological activity is related to the Augmented Reality Sandbox (<https://arsandbox.ucdavis.edu>) for simulating Earth's surface processes

In particular, **topographic contour lines** and an elevation colour map are visualized, and **the water flow is simulated**. By **hand-shaping** the sand in the box students may modify the topographic surface and visualize how contour lines, colour map and water flow change accordingly, in real time. The **students may interact with the virtual topography**. The concepts of some fundamental topographic attributes as slope angle, aspect, and planar and radial curvature may be visualized and easily modelled and modified.

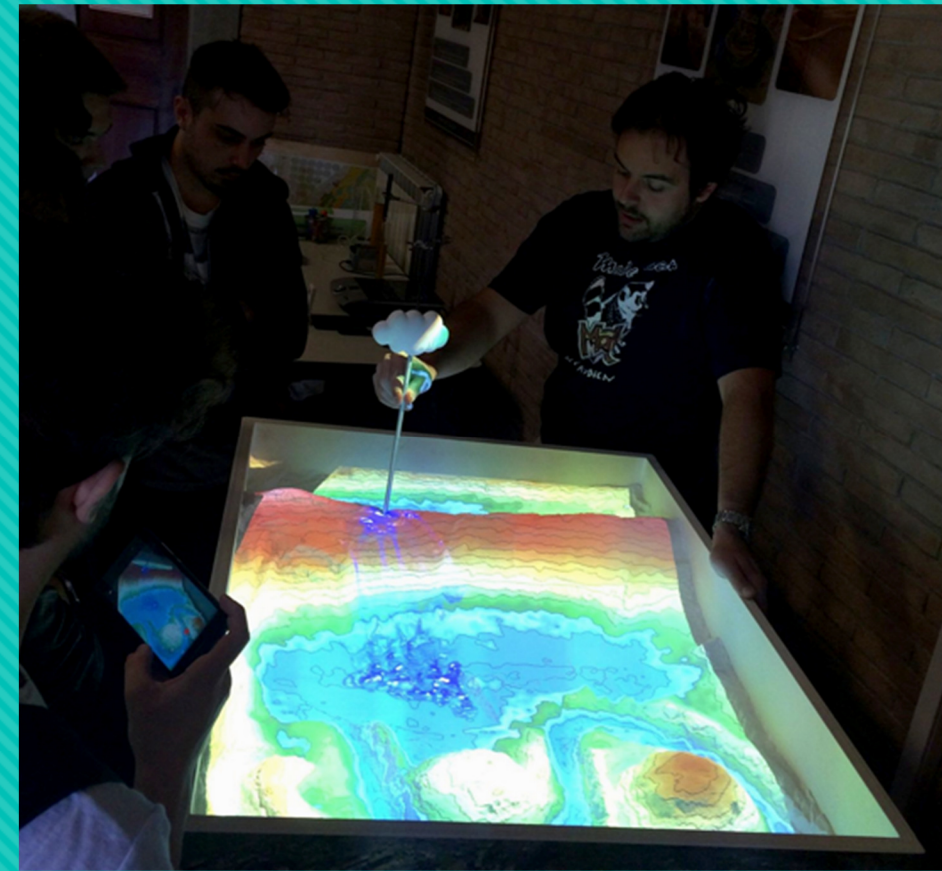


Fig. 4 – The AR sandbox with the simulation of waterflow directions..



✓ Earth Sciences, among which **Physical Geography and Geomorphology**, should be taught as a set of disciplines with **strong social relevance**, and are having as a priority the **sustainable development and participation of the new generations**.

✓ The **importance of non-traditional setting** and fieldwork to teach Geomorphology has been emphasized by many authors, the **IBA** and **problem-base learning**, is outlined as well as **virtual fieldwork**. ITC, represent recent tools to be put side by side to traditional learning methods.



✓ Educational paths and trails, laboratory activities, as the ones here summarized, will enable the students to **recognize the processes shaping the landscape that give origin to our geoheritage** but that are also responsible of **geomorphological hazards and risks**.





THANK YOU FOR YOUR ATTENTION

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www.aigeo.it

Developing new approaches and strategies for teaching Physical Geography and Geomorphology: the role of the Italian Association of Physical Geography and Geomorphology (AIGeo)

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