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## From the recovery of mathematical inadequacies to the development of transversal skills for physics students

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Reducing the drop-out rate between the first and second year during university studies through the innovation of teaching tools and methodologies has been the new action promoted by a national project in recent years. As part of the interdisciplinary coordination of the project's areas of Siena, we conducted a survey among the students of the scientific degree courses to identify the shortcomings and difficulties encountered in the first years of the course and the perception that the students had of the usefulness of scientific skills in (mathematical, physical and chemical tools) in the disciplines characterizing the course of study. The outcome of this survey, which began with sample interviews and ended with online questionnaires, revealed the need to develop an innovative action to fill in the entry shortcomings and to immediately promote the development of transversal skills such as problem posing, problem solving and the ability to model and argue in an interesting context for students.

The concept of the contextualized laboratory stems from a close collaboration between Physics and Mathematics teachers gained in interdisciplinary activities with the aim of designing and testing with the students materials that promote the active learning both in recovering incoming mathematical skills and in developing new skills needed in scientific training. The activity is configured as an educational research in order to identify the most effective tools which can be used in the training of graduate tutors who can use it correctly and permanently in support activities for students.

Since last year the survey on student needs ended well beyond the end of the first semester, it was decided to start a contextualized laboratory for the students of the degree course in physics in the second semester. The experimentation with the students was unsuccessful but allowed us to identify the critical issues to be overcome. This year the workshop took place in the first half of the year and achieved results well beyond the most optimistic expectations. The trial confirmed the validity of the educational materials developed and it will allow the next year to move on to the active training of the tutors.

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

no

**Level for award (Hons, MSc, PhD, N/A)?**

N/A

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