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Enhancing students' understanding of "science in the making" within a historical perspective

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The role of history in enhancing the understanding of scientific rationality is acknowledged from scholars in the field of didactics, both general (Martini B., *Pedagogia dei saperi*, 2011) and disciplinary (e.g. Matthews M.R., *Science Teaching: The Role of History and Philosophy of Science*, 1994). However, the problem of how to use history to design effective teaching-learning activities is still open.

The working hypothesis we propose in this contribution is the project of a historical-didactic workshop on physical sciences at the University of Urbino, to be carried out in collaboration with the Physics Laboratory: Urbino Museum of Science and Technology (Mantovani R. et al., *Una realtà dimenticata: il Gabinetto di Fisica dell'Università di Urbino*, 1991). We justify our proposal on the basis of the following:

a) The historical perspective is conveyed by having students interact with artifacts that are "objectified knowledge". Insofar the process of de-capsulating the knowledge therein can allow students to develop a deeper epistemological awareness about the role of instruments in scientific progress, these artefacts can work as powerful didactic mediators (Damiano E., *La mediazione didattica*, 2013).

b) While performing experiments using modern scientific apparatuses, with a design similar to the ancient scientific instruments exhibited in the Urbino museum, students can become acquainted with disciplinary epistemic practices and understand the reasons for their reliability. By actively working with these instruments, students can access scientific knowledge as the historical correlate of expert practices shared within the scientific community (Kitcher P., *The advancement of science*, 1993).

In summary, we argue that the workshop can improve students' practical epistemologies (Sandoval, W. A., *Science Education*, 89(4), 2005), while helping them replace the static image of science provided by textbooks with that dynamic of an ever-developing human enterprise.

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