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E-Learning of meteorological measurements during the Covid-19 pandemic

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During the COVID-19 pandemic lockdown, Italian schools and Universities were closed. Due to this situation, our research group, that is composed of high school teachers, University researchers and an experimental farmer, with an audience of 15 to 25 years-old students, underwent to a sudden and total change of learning, since the research laboratory shutdown and the construction of our experimental system of meteorological measurements was stopped.

The group had to manage the didactic activity, carrying out a Distance Learning thanks to the technological support of an on-line simulator like IDE-Arduino, tinkercad and circuit simulator LTspice and LUA Compiler, with the support of Thingspeak by Matlab.

This situation required to divide the theory that stays behind the meteorological measurements into several different laboratories to propose to students, with reference to their age and their previous competence.

Firstly we had to re-plan some of the electronics contents, trying to include e-laboratory activities, too, with the teacher support, by using the 5E Inquiry methodology. Here we show, as an example of the new educational approach to remote teaching, the practical activity focused on the functioning of components (transducers and actuators) used to build-up a meteorological station. Subsequently, we had to introduce in the meteorological station a data mining system, which would allow data on-line transmission aimed at a qualitative analysis of the experimental data.

The present case study is based on a qualitative analysis of the observed data (fig. 1 a,b,c). The conceptual framework started from the Vygotskijan idea, mediated by information technologies which were useful for socialization and communication.

The didactic methodology and the used ICT, may be a suggestion for the teaching community in order to organize and realize a distance laboratory practice (E-laboratory), besides the traditional methodologies.

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