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Innovative aspects for teaching the Geology and Climatology course in Agricultural and Forestry Engineering degrees

MC del Campillo, JC Cañasveras, I Sánchez-Alcalá, AR Sánchez-Rodríguez, JA Alburquerque, MA Castro, MA Rey, V Barrón, and J Torrent

Departamento de Agronomía, Universidad de Córdoba, Edificio C4, Campus de Rabanales, 14071 Córdoba, Spain

Courses of the first year at Engineering are typically basic to understanding other subjects and in many cases less attractive for students. In order to innovate and incorporate some aims of the Bologna process, here we present the development of the course of Geology and Climatology given the first year of Agricultural and Forestry degrees at the University of Córdoba. Temporal distribution of activities was as follows: a) to the whole group: 35% of master class, 5% of conferences and 10% of field trip, b) to the medium group (<30 students) 20% of seminars and c) to the small group (<15 students) 25% laboratory and field practical class, and 5% final oral presentation of individual work.

Students were assigned the performance of a professional work: characterization of the geology and climatology of an area that will need to know for the courses in the coming years (for example soil science, crop sciences and environmental sciences). Students have to a) complete a literature review of all work done to date, b) use and study the geological map (1:50000) published by the Geological Survey of Spain (IGME), visit the study area in which they had to pick up rocks and subsequently to characterize them, and c) obtain meteorological data from the Spanish Agency of Meteorology (AEMET) (minimum 30 years of precipitation, 15 years of temperatures and 10 years of other variables) for a complete characterization of the climate. The assessment system for students included: attend classes, participation in practicals and excursions, carry out exercices, oral presentation of the report and a final written test.

Key factors that favored student participation and interest in the course were: a) the small number of students in classes dedicated to the practicals and seminars and the continuous advice from teachers, and b) the personal choice by the student of the work area, usually close to their origin and in many cases from family property. All of this has served to students, who are involved with more dedication to the course, to solve specific problems and close to critical thinking, have contact with the real problems (in accessing the necessary data, characterization and interpretation), start to work as professionals. The effort by teachers has also been rewarded. The improvement in academic performance has been reflected in a significative increment of success rate (15% for Forestry Engineering degree and 30% for Agricultural Engineering degree.