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MOOC in "Agronomic Design of Localized Irrigation": Analysis of an innovation experience in Engineering Education

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The Massive On-line Open Course “Agronomic Design of Localized Irrigation" is an educational project aimed at facilitating the self-learning of drip irrigation related to the irrigation engineering and its technology. This MOOC is offered by the Universidad Politécnica de Madrid UPM (https://miriadax.net/web/diseno-agronomico-del-riego-localizado-2-edicion) since 2017.
The structure of the course was developed by the UPM research group "Hydraulics of Irrigation" fulfilling all the requirements of the MIRIADA X (www.miriadax.org) platform. The main objective was developed a self-learning methodology available to irrigation technicians and/ or students from the agronomic engineering background. Specifically, it offers the basic knowledge, from the engineer’s point of view, to design localized irrigation systems.
The MOOC was developed first by selecting the contents of the course, that was classified by matters and each matter divided in six modules containing 3 -4 lessons each. Then, the coordinator of the MOOC was appointed and the modules were assigned to the professors who developed the specific contents of the module. Every module includes: text file materials, slides presentation, numerical examples, questionaries’, evaluation tests and any other additional material.
For each lesson, a video (above 10-15 min long), where recorded by the professor who explained the lesson′ contents, also it highlighted issues that students should be remembered.
The contents of the MOOC cover the agronomic design, focusing in the definition of an optimal agronomic design, and then the hydraulic design. The MOOC includes: the estimation of crop water requirements; the irrigation’s depth and time; the irrigation frequency; the determination of the number of emitters per plant; the selection of emitter′s spacing; the movement of water in the soil and the elements of the irrigation system.
A progressive learning scheme was established taking into account the different level and motivation from the students and the knowledge they wanted to reach after the course. At the end of the course, the students who passed all the evaluation tests were awarded with a certificate.
This work presents the results obtained during the first year of teaching the MOOC, showing: the level of the students, the difficulties in the application of the methodology, the student′s opinion and the suggestions for its improvement.

Keywords: MOOC, localized irrigation, agronomic design.