

# EUCEET 2018

4th International Conference on  
Civil Engineering Education

CHALLENGES FOR THE THIRD MILLENNIUM

## **Application of BIM (Building Information Modelling) Methodology in a Project Based Learning subject**

**EUCEET 2018**

### **4<sup>th</sup> International Conference on Civil Engineering Education: Challenges for the Third Millennium**

**D. Sanchez-Ramos\*, A. Galán, L. Rodríguez, A. Arrieta and S. Moraleda**

E.T.S.I. Caminos, Canales y Puertos (Universidad de Castilla-La Mancha)

Av. Camilo José Cela, s/n, Ciudad Real, 13071, Spain

\*david.sanchezramos@uclm.es

#### **ABSTRACT**

BIM (Building Information Modelling) methodology is defined as “the use of a shared digital representation of a built object (including buildings, bridges, roads, process plants, etc.) to facilitate design, construction and operation processes to form a reliable basis for decisions” [1]. It consists in the collaborative transmission of information for the development and execution of a constructive project through the elaboration of a unique 3D digital model. The digital representation of both the physical and functional characteristics of a project allows users to transfer design data and specifications between different software applications and between members of a multidisciplinary work team. Since information is stored in a BIM database, whatever is necessary throughout the project life cycle - planning, design, construction, use, maintenance and deconstruction - can be properly planned and managed [2].

The concept of BIM was first introduced in the construction sector in terms of increasing efficiency, reducing costs and serving as support for the different stages of execution of the work, although its extension to all levels of civil engineering is currently in process. In Spain, the compulsory use of BIM in the design and construction phases of equipment and public infrastructures is due to 2018, while it is expected to be also mandatory for the maintenance or rehabilitation works in 2020.

With the above background, the School of Civil Engineers of Ciudad Real (University of Castilla-La Mancha), a pioneer in the teaching methodology PBL (Project Based Learning), has recently embarked in a Teaching Innovation Project whose main objective is the implementation of the BIM methodology in the Project Work subjects. In this work we present the BIM-aided design of a Wastewater Treatment Plant (Figure 1) developed by the students of the subject “Project Work: River and Water Management” (4<sup>th</sup> year, Degree in Civil and Territorial Engineering).



Figure 1.- Designed Wastewater Treatment Plant.

## REFERENCES

- [1] ISO Standard, ISO 29481-1:2016(E): Building Information Modeling — Information Delivery Manual — Part 1: Methodology and Format, 2016.
- [2] Ghaffarianhoseini, A., Tookey, J., Ghaffarianhoseini, A., Naismith, N., Azhar, S., Efimova, O., Raahemifar, K., 2017. Building Information Modelling (BIM) uptake: Clear benefits, understanding its implementation, risks and challenges. *Renewable and Sustainable Energy Reviews* 75, 1046-1053.