

# FRAMEWORK TO SUPPORT THE ASSESSMENT OF PROGRAMMING LANGUAGES STUDENTS' PRACTICAL WORK

**Zenón Hernández-Figueroa<sup>1</sup>, Margarita Díaz-Roca<sup>2</sup>, Juan Carlos Rodríguez-Del-Pino<sup>3</sup>, Francisco Javier Carreras-Riudavets<sup>4</sup>**

*1, 2, 3, 4 Departamento de Informática y Sistemas. Universidad de Las Palmas de Gran Canaria. Grupo de innovación educativa TILDE. (ESPAÑA)*

*zhernandez@dis.ulpgc.es, mdiaz@dis.ulpgc.es, jcrodriguez@dis.ulpgc.es, fcarreras@dis.ulpgc.es*

## **Abstract**

The introduction and use of New Technologies in the learning field not only does imply that the process should be structured, planned and done according to the more adequate criteria. On the one hand, we must work on the educative contents, their creation process, features and objectives because these contents are, with no doubt, an essential part in the process that will lead us to increase the quality of learning. On the other hand, these new technologies should be used for something else, like introducing new elements that help in the teaching-learning processes.

A Learning Management System (LMS) is a software application accessed through a web server that, making use of web technology, manages and broadcasts educative content to support the training that takes place in the classroom and the distance learning activities. A Learning Content Management System (LCMS) is a management system used to teach, like the LMS. Its web technology allows users to create and manage the contents of a learning program.

The most appropriate form of making use of these kinds of systems is to create content modular pieces which could be personalized, managed and reused.

A LMS can broadcast different types of educative material: text files, slides, animations, audio and/or video files or even software applications. It can manage the access to these contents, the work done with the applications and the assessment of this work.

Programming is one of the essential areas taught in university studies of Computer Science and other engineering degrees, as well as in diplomas of Computer Science. At present, it is a knowledge acquired through tutorial lessons and the practice with different tools for programming such as compilers, debuggers, interpreters, among others.

In computer programming the unit testing is a method used to ascertain if individual pieces of source code work as they should, that means, that for specific input data the output data are correct.

The framework introduced in this work is designed to offer lecturers a new tool to develop units testing with the specific aim of supporting the assessment of programming languages students' practical work. The modules are developed for Ada programming language. This tool is especially useful when it is combined with a web platform to manage the work of the students in these subjects. Its main features are the flexibility and ease of use. Consequently, it is really useful to have a homogeneous framework that allows developing systematically a huge amount of tests.

These tools form a powerful application which greatly lightens the students work load at the initial stage of programming. During this initial period they will neither have to deal with the complexities of the installation and the configuration of these types of tools, nor with the understanding of multiple options which they present, therefore being able to concentrate on the comprehension of the programming structures and the programming language to be studied.

This paper exposes the experience acquired in the creation of software modules that configures a framework to create software unit testing. They have been developed for subjects of programming languages of various official degrees from the University of Las Palmas de Gran Canaria.

**Keywords:** On-line teaching tools, e-learning, programming languages, learning management systems, moodle.