

A Web-Based Environment of Computerized Adaptive Tests

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Computerized Adaptive Tests (CATs) [1] are those test where the evaluation, the selection criteria of the next question to show, as well as the test finalization criteria are accomplished according to the knowledge level of the examinee at each moment. This kind of tests presents a lot of advantages respecting the classical paper-and-pencil tests: the number of questions for each examinee is reduced, questions are adapted to the knowledge level of the examinee, avoid the students to get boring, etc.

SIETTE (it stands in Spanish for *System of Intelligent Evaluation using Tests for Teleeducation*) is a web-based assessment environment. This system provides CATs to the examinees. The first version was developed in 1998 [2]. Currently, a new enhanced version has been released. In addition, new characteristics has been included. The architecture of SIETTE collects the main components of a CAT-based system.

It provides a virtual classroom, where students can make tests of different subjects. The adaptive mechanisms used by SIETTE are based on a psychometric theory called *Item Response Theory* (IRT) [3]. IRT is based on the hypothesis that the answer given to each question (*item*) of the test, probabilistically depends on certain latent trait, in this case the knowledge level of the student, that can be measured by means of an unknown fixed numerical value. This theory has been successfully applied to the item selection mechanisms, finalization criteria and student's knowledge level estimation in CATs.

SIETTE also includes a test edition area [4]. This place is used by the teachers to create and update the contents of the tests. Contents are organized into subjects. Each subject is composed by a set of concepts (*topics*). Topics are hierarchically structured forming the *curriculum*. Hence, each topic can have as many subtopics as required. Items are associated with the topic or topics whose knowledge is needed to successfully answer to them. At last, test definition are accomplished on topics. That is, when a test is created, the topic (or topics) involved in it must be specified. If a test of a topic has been defined, it will be composed by all the items of this topic, and from all its descendant topics [5]. Also, there are implemented several item selection criteria as well as several test finalization criteria. They are configured by the teacher for each test. There are a lot of possible test configuration. For instance, test can be temporised. Teachers can define a time limit to make a test.

In addition, this system provides the possibility of creating templates to generate isomorphic items. The teacher develops a template, and every time, it is posed to the student, one different item is generated. Additionally, a library of exercises has been developed to make the appearance of the items more amusing and to supply the possibility of including different exercises [6].

In this paper, we will show the new version of SIETTE, focusing on the main features of the virtual classroom, that is the CATs generator, and the test editor. Moreover the assessment mechanisms will be approached.

Keywords: Assessment, Computerized Adaptive Testing

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