

# A Mobile Learning Tool to Deliver Online Questionnaires

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## ABSTRACT

This paper presents a new mobile application designed for auto-assessment that allows students to test their knowledge and expertise in a specific topic using questionnaires designed by their teachers. Students' achievement was evaluated and results suggest that this kind of approaches can improve it.

## Categories and Subject Descriptors

K.3.1 [Computers and Education]: Computer Uses in Education – distance learning.

## General Terms

Measurement, Experimentation.

## Keywords

e-learning, mobile learning (m-learning), self-assessment.

## 1. THE SYSTEM

A web based system was designed and built to offer support for mobile auto-assessment in traditional class-based learning. The architecture comprises three different systems: (1) A web server to store, deliver and evaluate online tests. (2) The mobile application that students employ to connect to the server, download questionnaires and complete them. And (3), a web based front-end that offers different functionalities to each kind of user (students, teachers and administrators).

The system was developed using Java technology (JME for the mobile application) and XSLT transformation sheets. This latter technology permits an easy adaptation of the output that the web and mobile system require. Students must connect to the server, using their login and password, and then a list of all available subjects and tests is displayed. They can fill any of the available tests, get their results and review their answers (figure 1).

One important feature of the system is that it supports IMS Question and Test Interoperability (QTI) specification [1] to store and manage all tests and questions using that format. QTI is a widely adopted specification that ensures interoperability among systems since it ensures that the questionnaires designed for it may be later moved to any other compliant system.

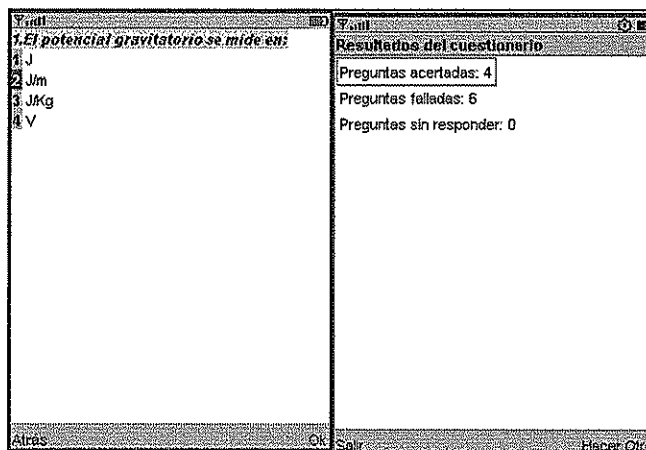


Figure 1. Mobile Application Screenshots (in Spanish). Left-A question, Right-Posttest results.

## 2. RESULTS

To evaluate the impact that mobile assessment may have on teenagers, an experiment was designed and conducted. Two experimental groups in two different courses of secondary education were established. The first was a Technology course with learners 14-15 years old students (N=15) and the second was a Physics course (17-18 years old, N=12). Two control groups of the same size were also established. Special care was taken to create them with students that showed a similar performance in the previous semester. Teachers were asked to provide the final grades of both groups at the end of the new semester. For the Technology course, mean value returned an important improvement for the final mark (18.5%) with statistical significance ( $p=0.017$  in a 2-sample t-test); for the Physics course, mean was increased by 7.29% (without statistical significance in this case).

Now we plan to try the system and its underlying methodology on larger samples and new courses to be able to generalize the results, but also, to be able to analyze its impact considering new variables (like learners age). Initial results in a university Nursery course (N=13) return an improvement of 7.11% in the final mark.

## 3. REFERENCES

- [1] IMS. 2006. Question and Test Interoperability Information Model – v2.1. IMS Global Learning Consortium.