



## New Assessment Tools in Learning Management Systems

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### 1. Introduction

Teaching needs at university have radically changed in the last few years [1], mainly in the way that students have to face their studies, due to the improvement of active learning methods and encouragement of autonomous learning techniques. Of course, this new approach has also affected the professor. The professor-student relationship have changed, creating new learning needs or adapting other such as evaluation methods (assessment of student learning and student self-assessment).

The assessment should be integrated into the teaching-learning process in a continuous way and it should help students to achieve their goals and scheduled outcomes [2]. Therefore, the assessments must be consistent with contents, competencies and outcomes to be achieved by the student.

The increasingly embracing of online education by institutions of higher education has been one of the factors that most has contributed to this change. A recent survey of 2600 higher-education institutions has reported that in 2010, 6.2 million students were enrolled in online education courses. Online education program enrollments represented about 30% of the post-secondary total, and this share is expected to rise to 37% by 2015. Nowadays, almost two thirds of for-profit institutions say that online learning is a critical part of their long term strategy. Moreover, 67% of academic leaders rate the learning outcomes in online education as the same or superior to those in face-to-face education. The 21% growth rate for online enrollments far exceeds the 2 percent growth in the overall higher education student population [3].

In 2010 at least 98% of Spanish universities have implemented, or are implementing, specific units responsible for e-learning support. In fact, e-learning technologies use is becoming more widespread and the consolidation of the initiatives to promotion this type of teaching is observed. Thus, in 2011 91.78% of the faculty staff uses LMSs and the percentage of students using it increase to 90.87% [4].

Therefore, different strategies of assessment can be observed in LMSs with respect to assessment [5]:

- Use of communication resources such as forums, chat rooms, mailing lists, surveys.
- Evaluation of contribution to shared resources such as wikis, glossaries or learning modules.
- Supervision of learning progress indicators in resources such as learning modules, wikis, glossaries (number of hits and/or time spent).
- Answering of test questions integrated in learning modules or grouped on independent tests.
- Submission of assignments or exercises.

Given the importance of assessment in online courses and programs, this paper examines the knowledge and use of different resources by faculty staff as well as what new items, not available in current LMSs, they demand. For this purpose, we used ILIAS LMS [6] to develop an online questionnaire for professors of the University of Jaén. Thus, we provided professors an online learning module [7] that describes the different types of test questions. Professors also could access to sample tests to evaluate their relevance and needs of each knowledge area.

The article is structured as follows: next section describes the objectives pursued. Subsequently, we show the questionnaire and then we analyze the results and conclusions.

### 2. Objectives

This survey is part of a study enclosed in an innovation and teaching project at the University of Jaén (Spain) [8]. The first phase attempts to verify the knowledge and use of ILIAS LMS by our staff faculty. In particular, the degree of knowledge and use of different test questions offered by ILIAS. The main objective is to study, identify and parametrize of new assessment question types to incorporate them in any LMS.

### 3. Survey

We conducted an online survey to discover the knowledge and use that university professors had about ILIAS and the evaluation tools that it contains. At the same time, we are working in the study of QTI [9] Standard and metadata classification in order to obtain a compatible parametrization method with current LMSs that allow us to describe new types of questions.

The survey was developed using ILIAS LMS and it was sent to 250 professors at University of Jaén who are involved in innovation projects. Finally, 96 professors filled out the survey. The number of users that polled each question can be seen in figure 1.

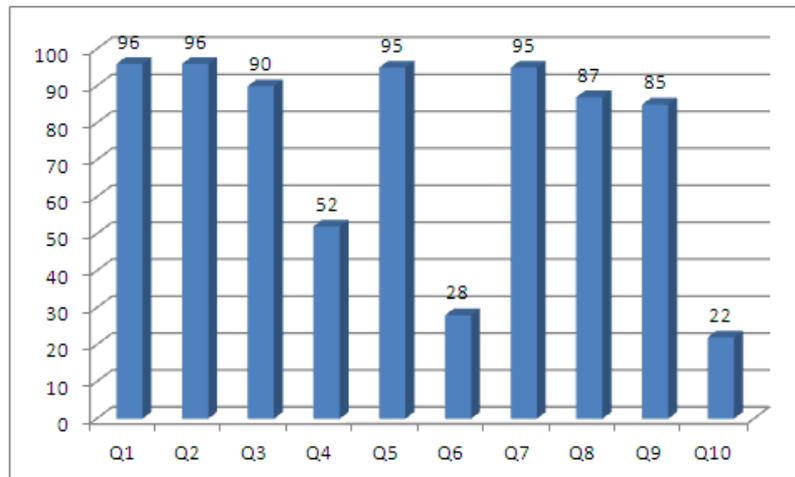


Fig. 1. Users by question

The mentioned survey consists of ten questions, some of which were optional:

1. How much knowledge and use of ICT you consider to have?
2. How did you get your ICT training?
3. Are you using LMS to assess your students or make them perform their own self-evaluations?
4. Which tools have you used in LMS to evaluate/self-evaluate students
5. Have you used other online assessment systems instead of, or in addition to, ILIAS? Please explain below.
6. Please check the types of questions from ILIAS you normally use in your online assessments/self-assessments
7. Would you be interested in conducting evaluations/self-evaluations in ILIAS with the "test" facility?
8. Which percentage of the course final grade would you assign to evaluations/self-evaluation in LMS?
9. If you had the possibility to create a new type of question in a LMS, how long would you devote to this activity?
10. With this project we try to get information about the type of questions you would need in ILIAS. If you are interested in adding new questions and would like to collaborate in our project, please explain briefly the questions you would need and add an example.

In the next section we show the results, but it must be taken into account that some questions were optional depending on previous answers. For this reason there can be different number of answers in some questions.

#### 4. Results and Conclusions

##### 1. Knowledge and usage of ICT.

Almost all participants in the survey answered this question (n= 96). 46.88% of professors chose the option "I make a common usage: I use Internet as usual platform of documentation. I keep my virtual teaching space up to date".

39.58% state that they have an advanced level of use ("I have discussion forums. I prepare activities, exams and evaluations in my online teaching activity, and also I prepare interactive slide-shows and keep my web page up to date").

Just 5.21% of respondent indicated that they have a low level of ICT competences ("Low level: I write e-mails and use word-processing tools. I occasionally made a slide-show and share it with students").

##### 2. How did you get your ICT training?

63.54% of respondents answered that they were self-taught and the 52.08% indicated that they got their ICT training in different innovation and extension courses (University internal training courses).

##### 3. Are you using ILIAS to assess your students or make them perform their own self-evaluation?

93.75% of those polled answered this question and 42.22% states that "never have used ILIAS in evaluation" Just 4.44% of respondent uses ILIAS completely for activities. And 12.22% uses ILIAS at least in 50% of course contents.

##### 4. Which tools have you used in ILIAS to evaluate / self-evaluate students?

Just 54.17% answered this question. The most used tool is submitting exercises (94.23% of responding users) following by Participation in discussion forums (71.15%) and Test (63.46%). The less used tools are Glossary Edition and Learning Modules with questions (7.69%)

##### 5. Have you used other online assessment systems instead of, or in addition to, ILIAS?

81.05% of respondent indicated that they had never used another evaluation system and 10.53% of professors had used Hot Potatoes.

##### 6. Please check the types of questions from ILIAS you normally use in your online assessments/self-assessments

When we ask about the types of questions from ILIAS the professors normally used in their online assessments/self-assessments, 85.71% of them said that they use Multiple Option Questions with simple answer, and 53.57% used Multiple Option Questions with multiple answers. Furthermore, Numeric questions, Essay

questions, File upload questions and Cloze questions were used between 36% to 43% of the professors. The less used type of questions were Error text questions, Ordering questions, text subset questions, Matching questions and Image map question, between 7 to 21% of respondents. None of them used Java Applet or Flash questions (Figure 2).

7. *Would you be interested in conducting evaluations/self-evaluations in ILIAS with the "Test" tool?*

90.53% of the professors polled state that they are interested in conducting evaluations in ILIAS.

8. *Which percentage of the course final grade would you be willing to give in evaluations/self made with LMS?*

41.38% of the polled professors agree with assign less than 20% from the percentage of the course final grade using LMS. Just 3.45% agree with the assign of more than a 75% of the final grade.

9. *If you had new questions types to ILIAS, how long would you devote to develop this activity?*

55.29% of the professors stated that they would spend between 1 and 2 hours per week. 14.12% would spend more than 2 hours per week and finally, 30.59% would spend less than 1 hour per week.

10. Only 9 professors made suggestions about the new type of questions needed in ILIAS. Those few professors suggested than they needed questions that attempt to assess resolution processes and not just to obtain the results (be able to control the process resolution of the problem) or questions that incorporate more interactive and multimedia resource.

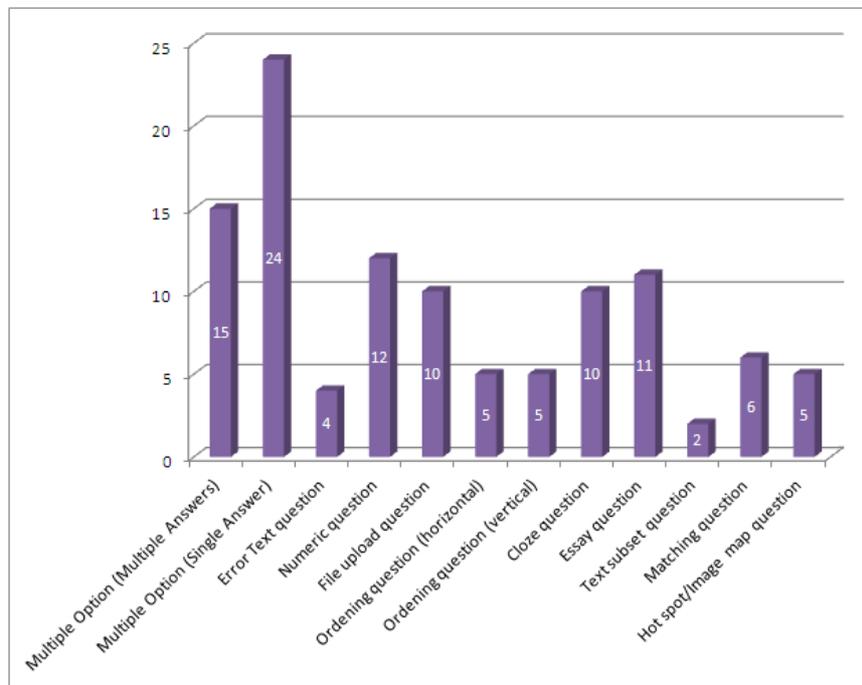


Fig. 2. Use of question types in online assessments

#### 4.1 Conclusions

This study reveals that (Figure 3) despite of the great interest and motivation of professors (89.58%), they made a very simple use of online assessment tools (42.22% never used). In addition, professors who make online assessment prefer "send exercises" tool. A small percentage of professors make use of tests tool (34.38%), but they use just a few types of questions (*Multiple Option Questions* mainly).



Fig. 3. Professors made a poor use of the resources offered by the platform

These results show that the professors have made a poor use of the resources offered by LMS. Moreover, we can conclude that they were unaware of the evaluation options. Therefore, the institution should make efforts in online assessment training.

Another possible interpretation of these results could be that many professors are confident on traditional methods because: they distrust of online assessment (the possibility of fraud) and/or because, they do not find the adequate questions to their evaluation methods. In this sense, the obtained results demonstrate that less than 10% of professors who participated in the survey have proposed new types of questions. The professor favorite assessment tools seem to be Collaboration, case learning, PBL (Problem Based Learning), interactive and multimedia questions.

### Acknowledgments

The present work is supported by the University of Jaén and its results are developed within the innovative teaching project PID-841012.

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