

How Wiris Quizzes helped to build a new formative assessment paradigm for Universitat Oberta de Catalunya (UOC)

Math courses are difficult for Engineering students

Math courses present many difficulties for students in engineering degrees, often related to **teaching and assessment strategies**.

UOC, a 100 % online university, tested and introduced a new teaching innovation experience focused on a **continuous assessment using Wiris Quizzes** in two calculus courses. Their aims for its new methodological strategy were:

- ✔ To **reduce the dropout rate**.
- ✔ To **improve the students' academic performance**.

Wiris Quizzes enhances the quizzing and evaluation system for STEM subjects

Wiris Quizzes is a STEM authoring tool that can be integrated seamlessly in any LMS. It enhances assessments by offering an **automated computer-based grading** of math and science questions. Why did UOC choose it?

- ✔ It **understands math** and enables mathematical expressions to be written and interpreted.
- ✔ It **breaks the restrictions** of multiple-choice questions.
- ✔ It generates **mathematical questions with random parameters**.
- ✔ Students receive **immediate and tailored feedback** on their answers in real time.
- ✔ It makes the most of academic institutions' digital resources and **enhances the use of LMS for STEM subjects**.

A new formative assessment paradigm with Wiris Quizzes

Before this new methodological strategy, the teaching methodology of a calculus course was based on a small number of tests with long completion deadlines, long gaps between these tests, and delayed feedback.

The new strategy was based on an online learning/assessment methodology with (mostly) self-correcting interactive questionnaires created with **Wiris Quizzes**:

- ✔ **Tests where students can practice exercises on each topic**:
 - ✔ Made up by 10 self-correcting Wiris Quizzes questions, combining multiple choice and **open answers**.
 - ✔ With each new attempt, Wiris Quizzes generates similar exercise but with different values, **to allow as much practice as needed**.
 - ✔ Once the answers are submitted by the students, Wiris Quizzes provides **immediate and tailored feedback** including the correct answer as well as the specific resolution.
- ✔ **The evaluation task itself**:
 - ✔ 5 Wiris Quizzes questions where the answers are **automatically graded**
 - ✔ An additional open answer question where the student must **develop the procedure** to the given answers.

... which leads to:

- ✔ **Continuous activity planning** and automatic and instant feedback with **short completion deadlines**.
- ✔ **Assessment** as the cornerstone of teaching and learning activity.

Academic outcomes

Quantitative viewpoint

- ✔ The number of students taking the continuous assessment increased 15 % above the total course average.
- ✔ The number of students who passed the course grew 8 % above the previous average in each semester.

This new formative assessment paradigm is effective in improving the students' results in online math courses.

Qualitative viewpoint

- ✔ Students' commitment: the increase in students' commitment to studying is positively compensated by the results obtained.
- ✔ Teachers' perception of the learning materials: With the use of Wiris Quizzes, their teaching is now more effective and creative, since the administrative and repetitive tasks have been radically diminishing.

Both students and faculty staff involved show greater satisfaction with math courses.

The present: a continuous improvement in teaching methodology

The results of this experience encouraged, and is still encouraging the UOC to continue developing and evaluating teaching methodology with the use of Wiris Quizzes. At present, **this methodology has been extended to four math courses** of the UOC's engineering degree, **in which more than 1,500 students are enrolled every semester**.