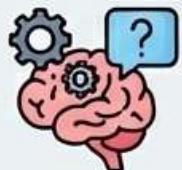# Active learning in higher engineering education: a decalogue for the design of post-lecture online quizzes

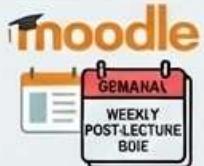Novkovic, D., Torres Kompen, R., & Petchamé, J. – RIED-29(1)

CONTEXT AND METHODOLOGY OF THE STUDY

Context: Online Quizzes and Active Learning

Quizzes as an active learning strategy (assessment, participation, retention).

Scarce research on POST-LECTURE quizzes.

Intervention and Methodology

moodle

WEEKLY POST-LECTURE BOIE

Bipolar Laddering (BLA)

ICT Engineering Students (Management Subject). Weekly quizzes on Moodle (one attempt, automatic grading).

Qualitative research (BLA) to extract positive and negative perceptions of students.

KEY RESULTS: STUDENT PERCEPTIONS

POSITIVE PERCEPTIONS

Valuable strategy for **EXAM PREPARATION**.

Foster **ENGAGEMENT**.

Promote **AUTONOMOUS LEARNING**.

NEGATIVE PERCEPTIONS / CHALLENGES

(Examples extracted from qualitative analysis)
Time pressure, question complexity, single attempt.

THE DECALOGUE: 10 DESIGN RECOMMENDATIONS

10 RECOMMENDATIONS FOR EFFECTIVE POST-LECTURE QUIZZES

1. Adequate and flexible time.
2. Clear alignment with objectives.
3. Varied and relevant questions.
4. Immediate formative feedback.
5. Consider multiple attempts (if applicable).
6. Consistent weekly frequency.
7. Progressive difficulty level.
8. Explicit connection to class content.
9. Use of analytics for improvement.
10. Student experience-centered design.

Conclusion: Post-lecture online quizzes are a valuable active learning strategy that, with adequate design (following the decalogue), improves engagement, autonomous learning, and exam preparation in engineering.