AKADEMIE FÜR LEHRENTWICKLUNG

IMPLEMENTATION OF IN-CLASS QUIZZES

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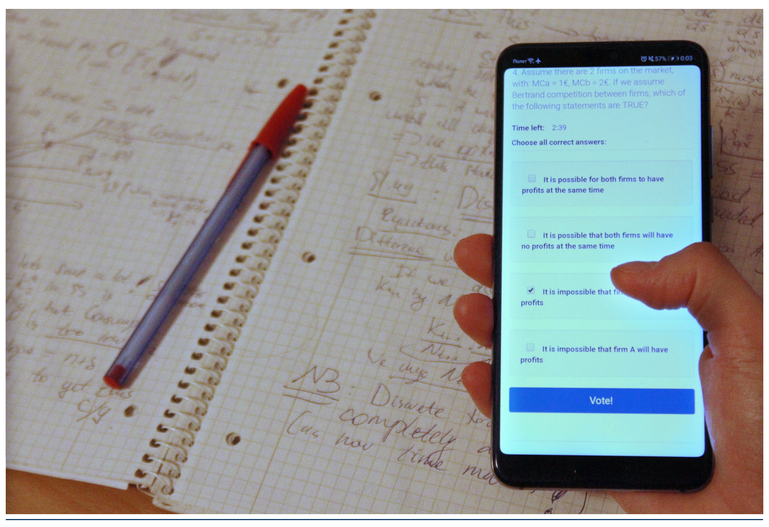
MOTIVATION



Picture 1
Participation in online in-class quiz with the help of smartphone and Pingo web--service

Many students face learning problems during they studies, which reduces significantly their learning productivity. One of the main reasons of such problems is lack of strategic approach to studies by students. Research shows [1-4], that structured approach to learning is a key to success in studies. One of the most important parts of learning strategy is regular retrieving and testing of residual knowledge.

In our project, inspired by research in the field of Educational Psychology, we try to address this problem using approach, which proved to be efficient in a series of studies, namely in-class quizzes.

The structure of quizzes implies using several types of questions, which aim to address the following study strategies, proposed by researchers: retrieving from memory, interleaving, generation and calibration.

The quizzes are to be implemented in-class via online quiz service Pingo and in Moodle for questions to solve at home, which is in line with the activity of the working group of the University “Neue Medien in der Lehre”.

OBJECTIVES

- Increase mastering of subjects by students
- Improve learning process via higher connectedness of material to real-world issues
- Increase in-class involvement of students
- Increase teacher’s awareness of students’ progress
- Implement new media technologies into teaching process

References:

1. H. L. Roediger & J. D. Karpicke, The power of testing memory: Basic research and implications for educational practice, Perspectives on Psychological Science 1 (2006)
2. M. S. Birnbaum, N. Kornell, E. L. Bjork & R. A. Bjork, Why interleaving enhances inductive learning: The roles of discrimination and retrieval, Memory & Cognition 41 (2013),
3. L. L. Jacoby, On interpreting the effects of repetition: Solving a problem versus remembering a solution, Journal of Verbal Learning and Verbal Behavior 17 (1978)
4. Justin Kruger & David Dunning, Unskilled and unaware of it: How difficulties in recognizing one’s own incompetence lead to inflated self-assessments, Journal of Personality and Social Psychology 77 (1999)

FOCUS OF THE PROJECT

The project addresses several aspects related to both sides of the learning process: students and teachers.

STUDENTS’ SIDE

Learning. Test practice is proven to be more efficient for refreshing and memorizing material then passive listening of teacher reminding previous material .

Involvement. Quizzes grab attention of students, fostering involvement and thinking process. It also stimulates shy or less motivated students to joint in the learning process. It also fosters competition and allows students to compare their performance with others.

Connection to real-world problems. Concluding questions of the quiz are supposed to be prelude to the lecture posing a real-world problem. This should increase intrinsic motivation and demonstrate that their understanding of the real world problems has increased.

THEACHERS’ SIDE

Awareness of teacher on students’ progress. Teacher gets timely information on the students’ progress as well as on material students are struggling with. It will help the teacher to reveal problem topics which should be explained in more detailed way or exercised more intensively before the exam.

STUDY STRATEGIES

The project refers to the scientifically proven study strategies which improve learning process, such as:

- ***retrieving from memory***, spaced in time is a better strategy then simple passive repetition [1]
- ***interleaving*** the study of different problem types improves ability to discriminate between different types of problems and identify them in real world [2]
- ***generation*** —attempt to solve a problem on one’s own before receiving solution improves further learning [3]
- ***calibration*** — receiving timely feedback on one’s level of knowledge [4]

QUIZZES

To implement these strategies in quiz practices, several types of questions will be used:

- Short ‘***Terms/concept ‘ questions*** aimed at emphasizing and memorizing main takeaways of the lecture
- ***‘Example’ questions*** which reflect application of models to real-life situations or alternatively illustrate assumptions of the models
- ***‘Problems/derivation’ questions*** which are aimed at training of mathematical aspects of the course
- ***‘Bridge ‘questions*** attempting to connect the information from previous lecture with new material. It addresses the concept of interleaving and helps students to see connections between different topics of the course.

These types of questions are organized in a 10-15 min quizzes consisting of 5-7 questions of different types, depending on the topic.

After the quiz correct answers and statistics of correct answers are displayed on the screen. This will be followed by feedback to each answer which addresses the aim of calibration.

After the class all the quiz answers will be analyzed, and the most problematic topics will be defined to be covered during the following exercise sessions.

Picture 2
Results of online in-class quiz in Pingo web-service

EVALUATION OF RESULTS

- **Students‘ feedback survey.** Ask students on their impression and suggestions about quiz practice. Two surveys are to be made: Midterm assessment and survey after exam. Survey will also include questions to reveal students‘ background and learning strategies they alerady use.
- **Teachers‘ feedback survey.** Assessment of teachers’ perception of quiz practice in terms of convenience and possibility to receive feedback on students’ knowledge during the semester.
- **Project‘s effect on exam performance.** Assessment of the effect of quiz practice on exam results (in comparison with exam results of previous years). To rule out possible difference in background of students it is proposed to use students‘ GPA data as a control variable.
- Carrying out test to control **residual knowledge** on a group of students attended the course during WS 18-19: June 2019 (possibly beyond the framework of the project)

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