Re-design of Databases
Course Curriculum and Students' Satisfaction

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About Database course

- DB course is held at the second year of an undergraduate study of informatics

- DB course continues on an Introduction to databases (IDB) course, which covers:
  - all the fundamental database related topics,
  - early database development,
  - relational theory and relational algebra,
About Database course

- normalization,
- relational database management systems
- practical work in SQL

- The course consists of theoretical lectures and practical exercises on the computer
Database course

• The main objectives are to:
  – introduce students to various types of databases (multimedia, distributed, NoSQL, cloud, analytical/data warehouses, etc.)
  – introduce students to database security and administration aspects
  – train students to independently build business applications based on relational databases, using rapid application development (RAD) tools
Lectures (before 2014)

• Before 2014 lectures were organized:
  – Traditional lectures in classroom for more than half of the semester
  – For the rest time of the semester students worked in pairs or small groups (up to 4 students) on a essay with preferred topic
    • something in the area of multimedia databases, distributed databases, NoSQL databases, cloud databases, analytical databases/data warehouses, etc.
Lectures (before 2014)

- Problems:
  - boring lectures,
  - minimum of interaction,
  - no motivation,
  - ‘no good’ energy in the classroom.
Lectures (after 2014)

• After 2014 we changed:
  – Theoretical lectures are substituted with 5 team game quizzes (5 team quiz competitions)
  – No face-to-face lectures, except on 5 quiz dates
  – 5 quiz topics:
    • multimedia databases,
    • database security,
    • NoSQL databases,
    • data warehousing,
    • cloud computing
Lectures (after 2014)

• The goal was to:
  – make the lectures more interactive, competitive and fun
  – motivate students for studying and achieving better grades
  – force students to become more independent
  – promote teamwork and cooperation
  – better prepare students for future work
Lectures (after 2014)

- Teams of 4 students
- For every quiz students have 2-3 weeks to prepare
- On the quiz date we all meet in the classroom
- First we prepared powerpoint presentations with questions
  - Two main teams for that quiz answered the questions
  - If they both didn't answer correctly, other teams also had a chance to answer (principle of rising the hand)
- Problems:
  - We often couldn't see who was first, and students were not satisfied
  - Students learn only for the topic where they are one of the two main teams
Lectures (in 2018)

- Quizzes are implemented in the *Kahoot* ([https://kahoot.it/](https://kahoot.it/))
- All questions are multiple choice
- Students join quiz and answer questions with their smartphones – 1 smartphone per team
- For each question 5 seconds for team talk and 10 seconds choosing the answer (15 seconds in total)
- Correct answer = 1 point, Incorrect answer = -1 point, No answer = 0 points
- All teams answer all quiz questions
- At the end of the semester their quiz points are translated into course points – there is a translation scale
Lectures (in 2018)

Kahoot desktop admin interface – all quizzes
Lectures (in 2018)

Kahoot desktop admin interface – one of the quizzes
Lectures (in 2018)

Get into your teams!
Join at kahoot.it and enter the game PIN

88 Teams

Kahoot!

Start

Each team can share a phone, tablet or laptop.

Kahoot - joining the quiz
Grade results
Grade results (in %)
Satisfaction results

- At the end of semester students filled in a short questionnaire about their satisfaction with the course
- We are satisfied with results 😊

![Students' satisfaction graph]

- Number of students
- Grades 1 to 5
- Years 2015 to 2018
Satisfaction results (in %)

Students' satisfaction

Grade 5
- 2018: 79.1%
- 2017: 75.3%
- 2016: 68.2%
- 2015: 67.7%

Grade 4
- 2018: 17.6%
- 2017: 14.6%
- 2016: 12.9%
- 2015: 7.1%

Grade 3
- 2018: 3.3%
- 2017: 6.7%
- 2016: 12.9%
- 2015: 7.1%

Grade 2
- 2018: 0.0%
- 2017: 0.0%
- 2016: 1.1%
- 2015: 2.2%

Grade 1
- 2018: 0.0%
- 2017: 0.0%
- 2016: 1.1%
- 2015: 2.2%

Grade 4 or 5
- 2018: 95.0%
- 2017: 85.0%
- 2016: 90.0%
- 2015: 80.0%

Legend:
- 2018
- 2017
- 2016
- 2015
Exercises

- In the exercises students can learn:
  - how to build standalone database and business application based on the relational and entity-relationship data model in rapid application development tool
  - at the end of the semester, students are required to develop their own application based on a relational database – final exam
Exercises

Example of entity-relationship model
Exercises

Example of business application created during practical exercises
Conclusion

• The students' reaction was positive to the changes we introduced in lectures
• Their satisfaction ratings are very high
• They are motivated for coming to lectures
• There are some technical issues to be solved
• We will try to find out some better quiz tool
• We will continue to work on improvement
Thank You for your attention!