Vietnamese-German University

Project

WS 2024/25

Development of a database-driven web application for activating students in academic courses

Prof. Dr. Christian Rich

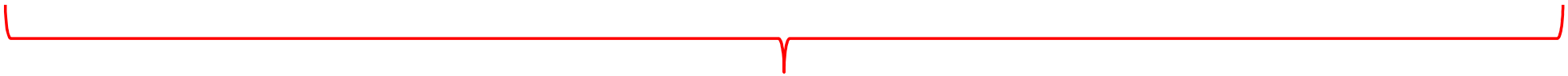
Frankfurt University of Applied Sciences

Computer Science and Engineering

Email: rich@fb2.fra-uas.de

Motivation

- Activating students in courses (away from a passive, absorbing role) has many advantages.
- Live feedback with multiple-choice questions (MC) can increase student participation and attention and be motivating.
- For teachers, feedback on students' understanding of the material is very important in order to be able to react.



- Overall goal: (further) development of a web-based, database-centered, quiz and voting system for courses.

Audio Response Systems

- Classic Audio Response Systeme

  http://www.youtube.com/watch?feature=player_embedded&v=pq9LV1Oj3gs
- Examples of newer platforms

  https://www.kahoot.com

  https://fra-uas.particifyapp.net/
- LARS

  https://lars.frankfurt-university.de

Motivation (cont'd)

- Creating multiple choice questions with several good answer options is time-consuming.
- In addition to a good question, questions require good answer options with "hits" as well as credible "distractors" that are intended to distract from the correct answers.
- Crowdsourcing for questions and answers as well as data analysis to find good distractors is possible.

- Goal: System with MC question / answer creation by participants

Possible course of action

Steps to create questions

Option 1:

The instructor creates free text questions

Option 2:

1. Some participants enter a question into the system
2. Participants can mark good questions from the set of questions created
3. Automatic selection of the best rated questions for the survey.

Possible course of action (cont'd)

Steps to create answers

1. Each participant receives about 2 questions as free text questions
2. The participants' answers are set as MC answer options.
3. Survey with the MC questions
4. Identification of good distractors by analyzing the response frequencies.
5. (automatic) reduction of the answers to the best distractors

Quantity Structure

Questions	number of participants	60
	number of questions	10
	number of best-rated questions	8
Answers	Number of required answers per question	8
	Number of required answers	64
	Number of played out questions per participant	2
	Number of participants which answer	40
	Number of received answers	80
	Number of answers received per question	8

Web-based, database-centric systems

- Advantages
  - User-friendliness
  - Can be used from any internet-enabled computer or smartphone
  - Data is stored in a single central location (this prevents redundancies and inconsistencies)
  - Multi-user capability
  - It is ensured that all users work with the same version and the same functions and data

Web-Apps / PWA

- Advantages (compared to native apps)
  - Platform independent, no separate development for e.g. IOS, Android, Windows, OSX, etc.
  - Easier maintenance and changes
  - No installation on end devices necessary
  - More cost-effective
- Disadvantages
  - Internet connection required

LARS 2.0

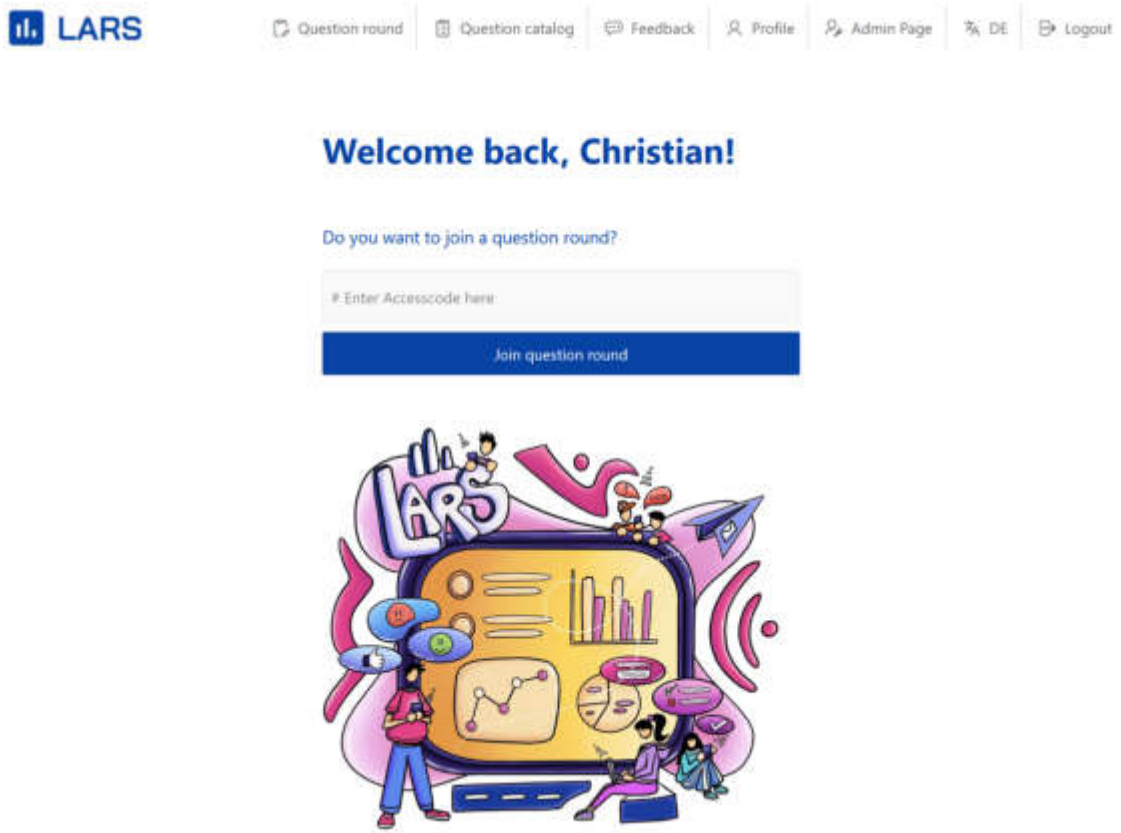
Goals:

- Modernization
- Mobile friendly
- Multilingual
- Participants see their results
- Images in questions and answers
- …

Current status

- Productive in operation
- but…

Demo



Project Approach

1. Requirements analysis
2. Design
3. Implementation
4. Test
5. Piloting!

Development Environment

- Oracle Application Express
  - Development environment on an Oracle database
  - Allows rapid development of web-based, database-centric applications
  - Platform and location independent, no license costs
  - Support for mobile devices (responsive themes, progressive web apps)
  - Use of SQL, PL/SQL, design templates, ...

Apex Examples

FRA-UAS Student Samples

- LARS
  http://lars.frankfurt-university.de
- ELSA
  https://lars.frankfurt-university.de/ords/f?p=470:1

Commercial Samples

- Oracle Learning Library
- https://apexapps.oracle.com/pls/apex/f?p=44785:1
- Ask Tom
  http://asktom.oracle.com/pls/apex/f?p=100:1

ORACLE Academy

FRANKFURT UNIVERSITY OF APPLIED SCIENCES

AWARD *of* COURSE COMPLETION

Application Development Foundations

PRESENTED TO

J[redacted]

FOR SATISFACTORY COMPLETION OF ALL COURSEWORK

02. February 2023

Prof. Dr. Christian Rich
Frankfurt UAS, FB2 / Oracle Academy Instructor

Submission / Evaluation

- Submission and final presentation: January 22 & 23, 2025
- Submission:
  - Printed documentation (technical concept, IT concept, test documentation, etc.)
  - Electronic:
    - All components for the executable system (DDL script, test data (script/export), application system, source code, etc.)
    - Documentation in PDF (or MS Word) format
    - "Project evaluation" form from each participant
- Evaluation:
  - Overall project/peer evaluation/individual evaluation

Organisation

- Modul Projekt
- Credits 10 CP
- Workload 60 hours with lecturer, 300 hours total
  (4.12.-23.1., i.e. 42 hours/week * 7 weeks)
- Project Teams Teams with 4-5 Student
- Information elearning VGU (https://elearning.vgu.edu.vn)

Organisation

The course will be held partly (i.e. on Dec. 4th and Dec. 11th) online via

- Zoom meeting.
  https://fra-uas.zoom-x.de/j/61954284284
  Meeting-ID: 619 5428 4284
  Passwort: 785611

Contact / Questions:

- Preferably in the lecture
- E-Mail: rich@fb2.fra-uas.de

Summary

Project goal

- Design and development of a (mobile) web application to activate students in courses.

Participant profile

- Participants should have good knowledge of database technologies, information systems and mobile applications.
- Participants must apply the knowledge they have learned in previous semesters and work on the task in a group with distributed responsibilities.