Cloud Technologies in Collaborative Learning in Electronics

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Information about the context

University: Technical University – Sofia, Bulgaria

Educational level & number of students: Bachelor degree (3rd semester), 98 students

Topic: Semiconductor Devices (Basic compulsory course)

Subject domain(s): Electronics

Duration: 15 weeks

The object: Common project and shared report

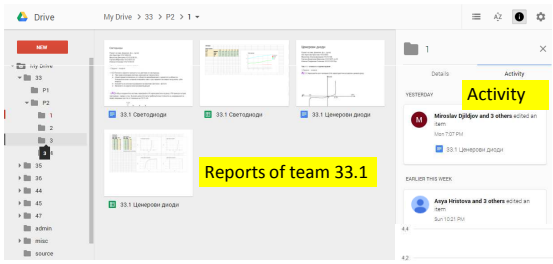
Why we choose to adopt TLA:

- To increase the commitment and motivation of students
- To obtain better students' knowledge and competencies
- To meet the business requirements for better practical training, team work on common task, responsibility for the quality of the overall shared product within deadline

How were the Design Principles applied :

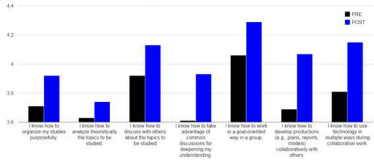
Design principles	*Implementation in the case*
DP1: Organizing activities around shared objects	Collaboratively development and preparation of shared projects and report s. Teams work organization – creating Google accounts, arrange teams and distribution project templates to different teams
DP2: Supporting integration between personal and collective agency and work	Coordinating participants interest – team members to perform quality project reports to get higher mark. Report evaluation depends not only on fulfilling all assigned tasks but on performing the tasks strictly within given period.
DP3: Emphasizing development and creativity through knowledge transformations and reflection	Discussing problems student faced during collective work on the shared object. Support flexible use of various kinds of knowledge: theoretical, literary sources; practical examples , cases, interactive tools; Force students to comment not only final report but on each other's drafts throughout the semester
DP4: Fostering long-term processes of knowledge advancement	Continuous working process – two week pre-lab design & analysis phase, simulation of explored device characteristics, circuit design and calculations of circuit and device parameters. sharing the drafts, getting feedback from the teacher, improving the report, using forums and blogs for discussing problems and exchanging views and opinions
DP5: Promoting cross-fertilization of knowledge practices and artifacts across communities	Students use up-to-date cloud computing and communication tools in order to plan, perform, organize and wright shared reports. The best final team reports could be used during the course as good examples for other teams, as well as after the course by the students themselves or by other courses.
DP6: Providing flexible tools for developing artifacts and practices	Google Drive, Google+, Docs, Sheets for collaborative editing of the project reports, reviewing and commenting. *Google calendar* – to set deadlines and to monitor progress – assignments, intermediate stages reporting, deadline for submission of project

Main Results

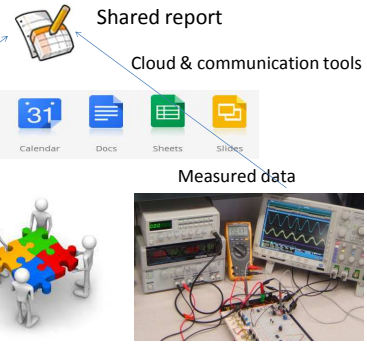


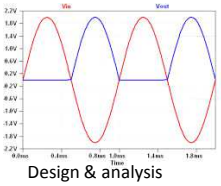
Shared projects in Google Drive

Together
Everyone
Achieve
More



Average students' answers

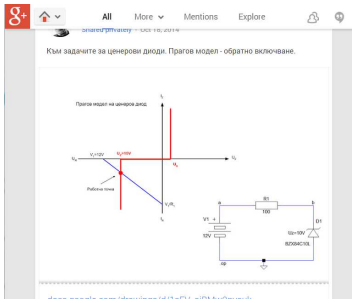




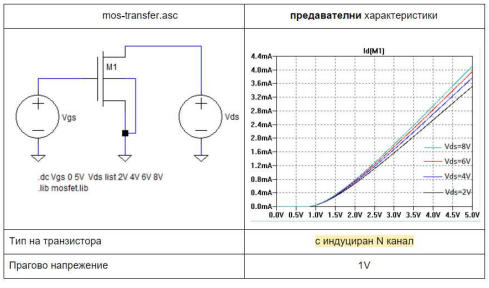
Design & analysis

Collaborative environment

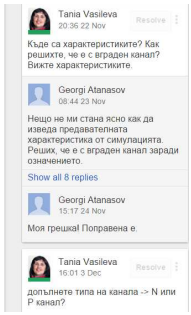
Group practical work



Group discussions in Google+



Communications with team members in Google



InnovaTion
SuccEss
EvaluAtion
DevelopMent

GroWth
SOlution
ProgRess
SKills

Benefits of collaborative learning

- Development self-management and leadership skills
- Promotion of active student-teacher interaction
- Increase in student responsibility
- Critical thinking and problem solving
- Exposure to diverse perspectives
- Collaboration across networks
- Accessing and analyzing information
- Preparation for real life social and employment situations.

Main challenges/constrains

- Challenges – Organizing & managing collaboration activities between huge amount of students
- Constrains on projects' complexity since the course is the first basic on e-

Further developments

- Promoting peer review between different teams
- Forcing comments between team members
- Encouraging students to make final evaluation of other groups
- Increasing complexity of post lab questions and tasks