

# Blended learning in embedded programming and microcontroller technique

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## ABSTRACT

*Blended learning, e-learning, video, survey, simulation*

Active poster session

## Background

The course has run for 1½ years, this semester being the fourth time. Observations from previous semesters had been that I spent 2 – 2½ hours in the lecture hall presenting material by using slide series and at the end demo programming. Before the students hand-on, I “live programmed” using the Atmel Studio IDE in front of the students, as Michael Caspersen et al. Lit 1 proposes. They were engaged to follow what I did. Last semester, I even recorded the screen and talk. Some students said in the evaluations that they would like more hands-on. I participated in the Learning labs course about blended learning and became inspired.

Therefore, I posed myself the question “**Is it possible to compress a 1 hour talk with slides to a 5 to 10 minute video and to let the students be more active during the programming exercises in the 4 hour lecture slot?**”

The presentation will show and discuss how students get more time for programming exercises in the 4 hour course as well as the tools used. An evaluation of the findings so far will be given. The digital electronics and programming course is a 5 ECTS course given on the 2nd semester of the B.Eng in Electrical Engineering degree course. A teaching experiment was performed fall-2016 during 13 weeks. At the conference I will describe and discuss the results in relation to previous teaching methods used during the last 3 occasions the course was offered. Together with video, some test questions are provided in a quiz or as multiple choice questions which should be taken after seeing the video.

I use PowerPoint slides and a screen recorder from Camtasia where it’s possible to record with the camera on the lap top or an external one. Along with the slide a video of the presenter’s face is shown, lit2. The duration is kept below 10 minutes – (lit. 2) recommends 6 minutes. The recoding is done in an informal setting. lit. 2 suggests: “instructors speaking fairly fast and with high enthusiasm are more engaging”(lit2).

Thus the focus of learning shifts from teacher centered to active learners. Learn everywhere. The active learning is practiced by team work with 2-3 students completing a total of 5 deliverable assignments together.

## REFERENCES

1. Exposing the Programming Process: Jens Bennedsen and Michael E. Caspersen IT University West, Denmark [jbb@it-vest.dk](mailto:jbb@it-vest.dk), [mec@daimi.au.dk](mailto:mec@daimi.au.dk). From: Reflections on the Teaching of Programming Methods and Implementations, (Springer, 2005)
2. How video Production affects students engagement: an empirical study of Mooc videos by Rubin Philip J. Guo (MIT CSAIL) University of Rochester, [pg@cs.rochester.edu](mailto:pg@cs.rochester.edu), Juho Kim (MIT CSAIL) [juhokim@mit.edu](mailto:juhokim@mit.edu), Rob Rubin edX [r rubin@edx.org](mailto:r rubin@edx.org). (2013)