Online Education

Challenges and opportunities for staff and students

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Who am I?

- M.Sc.EE 1989 from Technical University of Denmark
- 15 years R&D at Bang & Olufsen

- PyPy – EU Research project under FP6
  - Saarbrücken, Germany

- Startup company – AI
- SW-Consultant – Vestas
- Lecturer at Aarhus University

Contents

- The existing Education
- The online education landscape
- The Challenges
- The new education
- Python and Online education

The existing Education

- Electronic Design Engineer
  - Accredited Bachelor education
  - 3,5 years
  - Aimed at Embedded Engineering
  - Most graduates work in the local industry (mostly Windpower and related)
  - Small education
- Located in Herning
  - Western part of Denmark

University of Aarhus

- Largest University of Denmark
  - By number of Students
  - Through mergers
  - Distributed campus
- Danish Higher Education
  - Tuition is free
    - Universities are statefunded
  - Student get a monthly allowance from the State
  - Can apply for Student loans

Online Education offers

- Coursera
- Khan university
- OpenEDX
- Stanford, Harvard,…

Online Education offers

- Most focus on single topics/certification
- Short videos explaining a topic.
- Problems to solve
- Tests after each section

Challenges

- Keep online students focused
- Social isolation
- Motivation
- Remote teaching
  - Planning
  - Anticipating questions
  - No interaction

Teaching vs Learning

- When focus on Teaching the teacher is important
- When we fail at Teaching we blame the students

- No good students/ bad students

Learning

- When focus is on Learning the student is central
  - How do you learn the best?
  - When do you learn the best?
  - Where do you learn the best?
- The teacher has to provide the environment for learning
  - Tools
  - Curriculum

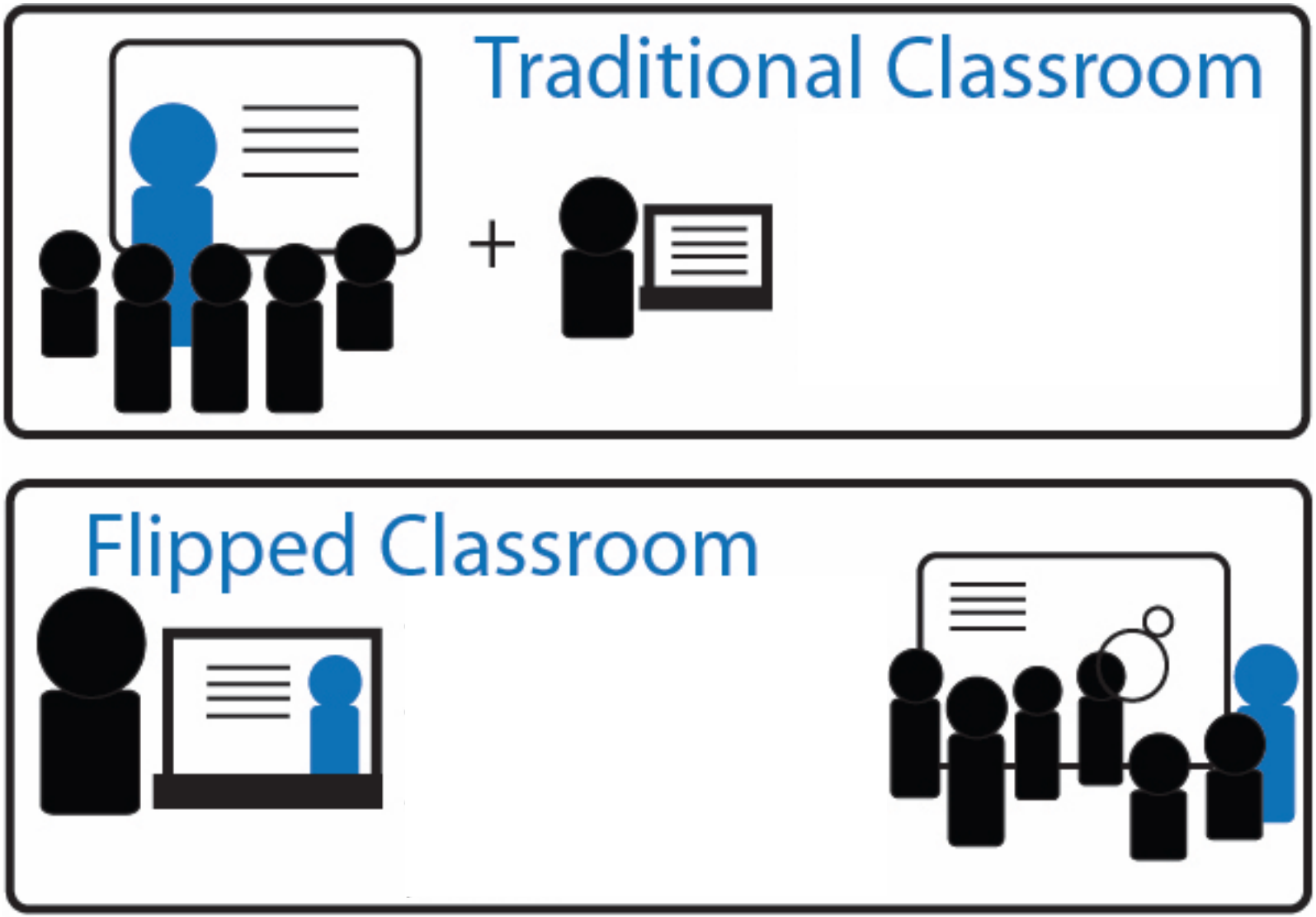
The new Education

The new Education

- Bootcamp
  - A introductory week on campus
  - Team formation
  - Setup of computers

The new Education

- Flipped classroom
  - Students are active during lessons
  - Prepared through video lectures/reading
  - Solving problems in groups
  - Discussing their learning
  - Students both on-campus and online


Traditional Classroom
+
Flipped Classroom

The new Education

- Adobe Connect for collaboration/interaction
  - Multiple users
  - Screen sharing
  - A national center manages the system
- LifeSize for streaming

The new Education

- Home electronics lab
  - Breadboard
  - PC Oscilloscope
  - Embed board
  - Multimeter
  - Components
  - tools

Python in Online Education

Python in Online Education

- Entry level programming
  - Great for learning to program
  - Gentle learning curve
  - Less boilerplate
  - Possible to have multiple levels of learning
  - Scale to many topics in CS
- Supplemented with C to cover embedded systems

Python in Online Education

- Matlab replacement
  - IPython Notebook
    - Colaborative extensions coming up
  - Numpy
  - Scipy
  - Matplotlib

Python in Online Education

- Python is more and more accepted in industry
  - Student have a 6 month internship
  - Python is often part of the workload

Conclusion

- We offer a accredited, state funded, online Bachelor degree in Electronic Engineering
- We focus on learning
- Both on-campus and online
- First online class starts september 2015

Thank you!

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