

# Flipped and blended classroom approaches at AAU: theory, cases and toolbox



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## ABOUT THE PROJECT

This project documents and illustrates 6 examples of blended classroom (BC) and flipped classroom pedagogy. BC offers both face-to-face and virtual elements while in FC the learning design changes the typical division of student work. For example, lectures or instructional podcasts could be moved online to be viewed before class, while classroom time is dedicated to learning activities that require students to engage with the concepts at a higher level.

The teacher's role 'flips' to become more interactive and provide answers to contextual and applied questions, give feedback, and prompt reflections of key ideas. Research evidence shows that such approaches increase levels of problem solving structure and practice but also indicates that students may at first be sceptical of such approaches. This project will build on these findings to present 6 selected examples to inspire university teachers across the faculties to apply BL and FC approaches to their teaching. The examples present typical teaching scenarios that have been transformed representing different levels and novel teaching solutions. Each example is contextualised in the PBL environment at AAU.

## THE OUTPUT OF THE PROJECT

Each case has led to three kinds of outputs.

1. Background/theory: text document that explains the pedagogical and didactical reasoning for the FC or BL approach used in the example.
2. Video on practice: a podcasts that shows and shares the details on what was done and how it was implemented.
3. How-to guide on tools: visual material (image plus text) to provide step-by-step, hands-on instructions on how to utilise and apply specific IT tools that support FC and BL

## REFERENCES

- [1] Bitner, N. and Bitner, J. (2002). Integrating Technology into the Classroom: Eight Keys to Success. *Journal of Technology and Teacher Education*, 10(1), 95-100. Norfolk, VA: Society for Information Technology & Teacher Education.
- [2] D. Gnaur and Hüttel (2017). *Podcasting for Teaching and Learning in Higher Education*, Higher Education Practices, vol. 2. Aalborg University Press, 2017.
- [3] Rivard, L. P., and Straw, S. B. (2000). The effect of talk and writing on learning science: An exploratory study. *Science education*, 84(5), 566-593.

## THE SIX CASES

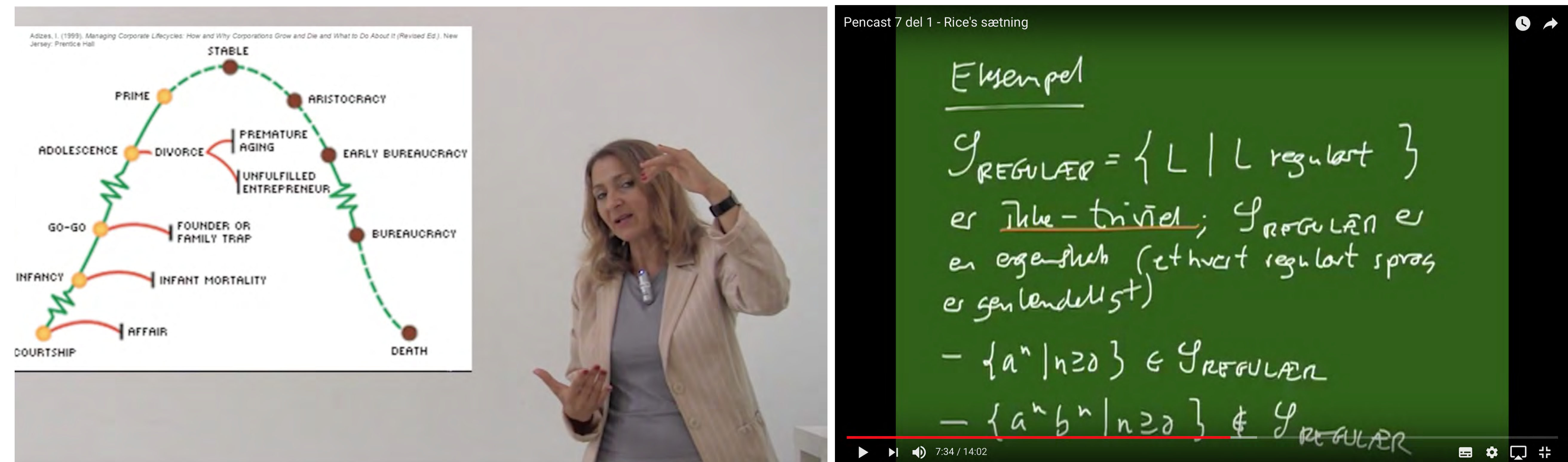


Figure 1: Two examples of podcasts. Left: A live recording (Dorina Gnaur). Right: A pencast (Hans Hüttel)

**BL - Integration of video for reflection (Eva Petersen – Nano-technology)** In this blended learning approach students were given individual assignments to solve chemical equations. Students video recorded themselves solving those assignments, giving the teacher an opportunity to (re)view videos and detect the level of competencies of understanding and applying scientific concepts through the students verbal explanations. This video supported approach involving the construction of scientific explanations is also supporting evidence that suggests how talk combined with writing appears to enhance the retention of science learning over time [3] has contributed to raising the pass rate in this course and was used to build on with group work in class.

**FC - Office Mix for podcasting in mass customisation (Kjeld Nielsen)** This case illustrates the adoption of a FC approach by utilising ready and available technology (Office Mix) that required little new learning by the teacher and how this led to a revision of teaching approaches and materials towards an increase of active in class learning. This approach clearly highlights how to overcome the challenges attributed to the uptake with new technology for teaching [1] and the example here has led to the teacher providing assistance to other colleagues on how to easily adopt new technology with the aim to revitalise teaching approaches.

**FC - A computer science course on computability and complexity theory using pencasts and peer reviews (Hans Hüttel)** This case describes how the teacher re-structured a course on the theory of computation in the fifth semester of the degree programmes in computer science and software. The presentations moved from a traditional lecture-based format using a blackboard to using pencasts recorded using an iPad and a stylus, and the active learning

moved to plenary sessions and peer-assessed exercises about key concepts covered in the course text.

**BL - Using Google+ (Nicolai Steinø)** This case illustrates how the social network Google+ can be used in a course in the fourth semester of the degree programme on architecture and urban planning for sharing video lectures, readings, assignments and materials, for sharing work in progress submitted by the students, and for commenting, asking and answering questions between classes.

**BL - Teaching objected-oriented programming to 2nd semester students (Thomas Bøgholm)** This case illustrates the use of supplementary podcasts in a course on object-oriented programming in the second semester of the computer science and software degree programmes. The teacher recorded videos explaining solutions for the weekly assignments of the course as well as for the more challenging exercises posed in the problem sets. Moreover, the teacher made video presentations of some of the harder topics covered in the course. These latter presentations were meant as supplements to the lectures covering the same material.

**FC - Podcasting in a course in Change Management (Dorina Gnaur)** In this flipped class approach, students were given the opportunity to gain exposure to the lecture content prior to class in the form of pre-recorded video presentations of the lecture content. They were also advised to prepare questions that needed further discussion in class and received reflection questions to facilitate understanding. Class time was then used on active learning and activities requiring higher-order thinking such as case-based work and problem solving together with peers.

## CONTACT INFORMATION

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