Theory, cases and toolbox

Flipped and blended classroom approaches at AAU

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Summary

This project documents and illustrates six examples of blended learning (BL) and flipped classroom (FC) pedagogy at Aalborg University. BL involves typically the blending of face-to-face and virtual elements while in FC the learning design changes the classical time spent between teachers and students in and outside of class. For example, in FC approaches lectures or instructional podcasts may 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 skeptical of such approaches. This project explored six selected examples to inspire university teachers across the faculties to apply BL and FC approaches to their teaching. Each case is contextualised in the PBL environment at AAU and presents three distinct outputs: Background/theory, a document that explains the setting of the case, the particular challenge and the innovations together with the pedagogical and didactical reasoning for the BL or FC approach used in the example. Next, each case incudes a video on practice: a podcast where the 'case owner' shares the details on what was done and how the teaching innovation was implemented. Finally, each case presents a 'how-to' guide on selected tools, where step-by-step instructions are provided that include images plus text instructions, guide how to utilise and apply specific IT tools. The six cases present different scenarios including: the integration of student produced videos; how to turn existing presentation slides into podcasts, pencasts to model thinking on computability and complexity theory; the use of Google+ for interactive teaching and learning; pencasting to support objected-oriented programming; and flipped classroom teaching through the integration of video podcasts in change management, language and international business communication. We found that each case represents a unique application of technological knowledge that is fused with a teacher's pedagogical content knowledge. The process of teachers reflecting on the specific needs they want to address in their teaching is key to transforming their practices and innovating their teaching through technological applications.

Main findings

"I wanted to shift the attention away from the presentations and focus on the problem-solving aspect"
(Associate Professor Hans Hüttel, reflecting on the drivers for his teaching innovation)

In this project, we conducted six case studies that involved experienced AAU University teachers. They were all experienced instructors in their subject areas (representing specific content knowledge) who were skilled in contextualising their teaching in a problem-based learning environment.

The professors were asked to describe various aspects of their courses, the use of technology and pedagogy, and the successes and challenges they faced. From here on they explored different possibilities for technology integration.

The discussions with the professors demonstrated their nested awareness of the dynamic interaction between content, pedagogy and technology (Benson & Ward, 2015).. Each case identifies situated technological knowledge that is specific to the instructional activities in each course. The case descriptions provide information how teachers managed to infuse their existing teaching practices with innovative approaches that involved the integration of technology.
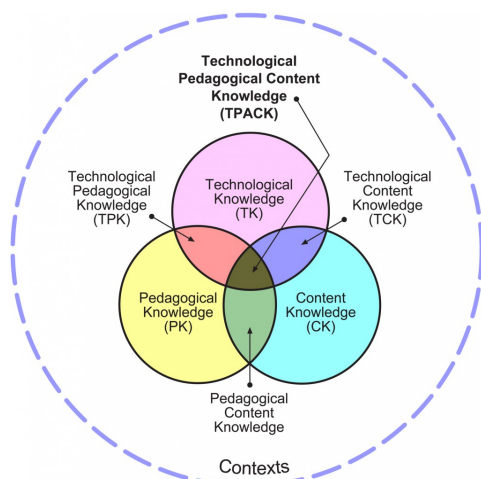

Figure 1: The TPACK model reprinted from http://tpack.org/with permission. See also Mishra and Koehler (2006)

What we saw was a negotiation of the relationship between technology, pedagogy, and content set in PBL thinking that formed an expertise greater than the pedagogical knowledge of an individual area (Benson & Ward, 2015).

Quality matters
It was important for the university professors in the six cases to build on their professional knowledge and focus on an increase of quality in PBL. This means that in each case the application of technology represents a very unique and nested innovation even if it is based on general best practices in blended learning and flipped classroom approaches.

The work that we conducted in each case was beneficial in promoting a reflective process for the university teachers and how they might be working on technology integration for teaching and learning. It was of importance that teachers were able to reflect on the degree of technological, pedagogical, and content knowledge and the manner in which the knowledge areas could be integrated to achieve the desired learning outcomes.

It is clear from this project that we cannot think about technology as an isolated solution to achieving changes in teaching and learning but that it is all about the integration of technology to achieve true transformation in teaching (see also Otrel-Cass 2015).

Teaching innovation is a matter of intentionality
Understanding the connections between the possibilities that technology implementation may offer and pedagogical decision-making is key moving towards transformations. Intentional pedagogical decisions are fundamental for fostering transformative practices in PBL or any University teaching approach. This process has to be supported through discussions and professional development that allows teachers to explore how to integrate and expand teaching and learning experiences. It is then through the blending of pedagogical knowledge content knowledge and technological knowledge that enables teachers to use particular digital technologies to address particular issues that they and their students encounter when they are learning a particular content.

Each case is supported by theoretically unpacking different aspects to the teaching innovation. Since the project is cornered on the two pedagogical ideas of flipped classroom and blended learning the concept descriptions are highlighted below.

> Flipped Classroom (FC)
> FC has been described as the kind of teaching events that would traditionally take place inside classrooms and now take place outside classroom and the other way around (Gnaur & Huttel, 2016; Lage, Platt & Treglia, 2000; McNally et al., 2017). An important aspect is that a flipped classroom is typically associated with blended learning approaches, this means that the use of technology is blended with more traditional teaching approaches and often involves computer supported work outside the classroom while group based activities characterize in the classroom activities (Bishop & Verleger, 2013). McNally et al. (2017) explain that a flipped classroom needs to include "a) an opportunity for students to gain exposure to content prior to class (e.g., recorded lectures), b) an incentive for students to prepare for class (e.g., pre-class quizzes), c) a mechanism to assess student understanding (e.g., graded pre-class quizzes), and d) in-class activities that focus on higher level cognitive activities involving active learning, peer learning and/or problem-solving" (p.2).

> Blended Learning (BL)
> The pros and cons of traditional and online learning have been much debated. But as several studies seem to suggest, rather than contemplating the complete substitution of online courses for campus-based courses, what may drive learning to new levels, is the combination and integration of ICT with face-to-face learning in what is generally referred to as blended learning (Aspden & Helm 2004; Garrison & Kanuka, 2004; Lim, Morris & Kupritz, 2007; Rovai & Jordan 2004; Steinø, 2015). In traditional courses as well as in blended learning formats, social presence, or the psychological distance which exists between students, and students and instructors/teachers, is important for successful learning outcomes. Establishing a sense of connectedness is particularly important in collaborative online learning (So & Brush, 2008). The emotional learning climate, the sense of intimacy and immediacy, as well as the feeling of being connected and to belong, is an important indicator of the effectiveness of the learning (Wu, Tennyson & Hsia 2010).

The six cases

	Teacher	Approach
Blending teaching with student produced videos	Evamaria Petersen	Blended Learning
Building podcast resources	Kjeld Nielsen	Flipped Classroom
Pencasting in the Flipped Classroom	Hans Hüttel	Flipped Classroom
Google+ as Communication Platform for Blended Learning	Nicolai Steinø	Blended Learning
Supplementary videos with solutions to exercises	Thomas Bøgholm	Flipped Classroom
The Flipped PBL Classroom	Dorina Gnaur	Flipped Classroom

The full report includes the case descriptions, theoretical unpacking, links to videos as well as instructions to show how to go about using some of the technological tools that have been introduced.

Further reading

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