

Aalto Online Learning - a pathway to reforming education at the Aalto University

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1. ABSTRACT

Why is it essential to enrich learning experiences at a university by moving online? What should a university do to reshape its offerings to better fit online learning settings? How to create communities of teachers to facilitate learning about online tech and pedagogy from peers? Who should be involved? In this paper we discuss these questions that have been addressed by the Aalto Online Learning (A!OLE) project to initiate a path for a culture shift in the Aalto University to offer significantly more online/blended learning options for our students. We discuss this from various angles, ranging from the strategic decision to invest in online learning development (motivation), to community building and mutual coaching, and finally to dissemination of best practices for producing online learning resources as university wide shared activities.

2. TRANSFORMING EDUCATION REQUIRES ACTIONS

Digitalisation is transforming higher education. Aalto University considered this a strategic challenge and launched in 2016 a 5 year project, Aalto Online Learning (A!OLE), to address it and reform its current educational culture. A!OLE project started first with nine pilot courses from all Aalto University schools and the Language Center and has up until March 2017 grown to include more than 50 pilots. The goal is to develop, explore and evaluate novel advanced technical solutions and pedagogical models for online/blended learning, often best realized as inverted/flipped classroom (see e.g. Lage et al. 2000 and Mason Shuman, Cook 2013). The key results are both new online learning resources for students, and dissemination of identified best practices and models into wider use for teachers in all Aalto schools and units to facilitate a creation of engaging online/blended courses.

We recognize that digitalization of education is not a goal *per se*. It is a means for improving quality of education and addressing challenges in the modern society, for example, facilitating access to education for a more diverse group of students, many of whom cannot regularly attend the campus for various reasons (like working elsewhere or international mobility). The increasing number of students requiring personalized and flexible learning, yet often from distance, together with limited teaching resources also raises serious challenges for scaling up educational offerings or even for maintaining their current level. At the same time the on-going massive digital transformation calls to make sharing of learning materials to be easy and rewarding.

At the same time university pedagogies are transforming from teacher-centered approaches (i.e. teaching) towards more student-centered approaches (i.e. learning). This calls for novel ways to support students in building skills for lifelong, proactive learning. Interactive, pedagogically sound digital learning resources can provide here better support compared to printed materials, or static web pages. Enriching the learning process calls for developing these engaging, interactive digital solutions to achieve true transformation of education to meet the needs of tomorrow. To reflect the first year activities and results of A!OLE, we summarize below the identified main challenges and discuss the key experiences and emerging best practices.

Our vision and goals for the next four years, and beyond are:

1. a networked community of teachers that are willing to coach each other, and also to be coached on creating online learning contents, methods and tooling.
2. in next three to four years a set of a few hundred pilots—making the annual pilot amount to be around 50—that implement and evaluate ideas iteratively into courses, both to existing ones and to newly created.
3. a core set of selected and developed platforms tightly related to themes, and where our internal and external expert network forms a strong basis for support and further development
4. online guidebooks and intensive workshops that support both using suitable pedagogical models, online platforms and tooling, and also creating of them in an iterative fashion
5. tested concepts for
 - a. different educational settings to be used either out-of-the-shelf or with minimal tailoring
 - b. supporting learning of teachers to be professional producers of course components for online/blended learners

3. ELEMENTS OF THE CHANGING EDUCATIONAL CULTURE

Digitalization of education is a highly complex process. An obvious, yet nontrivial step is to produce high quality online learning contents, e.g., online textbooks, presentations with audio explanations, video tutorials, animations, and interactive learning contents like simulation tools and automatically assessed exercises. Moreover, another set of challenges is introduced when transforming current practices in the teaching/learning processes (communications, team working and grading into a digital form) for online learning settings. Both areas include considerable learning curves for the university staff with a varying range of ICT skills. However, even more challenging issues remain.

Essentially we need to identify, develop and disseminate new pedagogically sound approaches within the university, such that employ digital resources and tools in an efficient and meaningful way to support learning. Traditional classroom-based education with lectures, closed labs and manual grading cannot be straightforward transformed into digital form without taking serious risks on poor pedagogical choices. We therefore need to rethink much of the pedagogical and organizational practices with the goal of combining the best sides of online learning and face-to-face sessions to create novel high quality teaching and learning processes and experiences (see McLaughlin et al. 2013, Pearson 2012, Tune, Sturek and Basile, 2013).

We aim at changing the whole educational culture in the university. For example, automating mundane tasks allows teachers to focus on student guidance instead of grading mechanical tasks. This guidance also includes selecting and facilitating digital learning resources (like intelligent tutoring systems (Strayer 2012), online video tutorials or automatically assessed exercises) which students can explore on their own or in groups. Then *in situ* face-to-face sessions and human teaching resources can be used, e.g., for orientation to the field, discussion, joint problem solving, and constructive feedback. The log data on how students use digital resources allows analysis of students' learning processes and studying practices to provide them advanced personal feedback, and earlier identification of cases (e.g. student is struggling) where teacher intervention is needed.

Building such a new educational culture is a long process and a major effort. It requires building incentives for teachers to change their existing practices, and providing adequate on-demand support functions for them. Strong support and considerably resources from university leadership are essential. However, such a culture change cannot be simply ordered "from the top". A central part of the change process is building supporting networks and activities for teachers at a grass root level. For this we have initiated a concept of an open *call for idea proposals*, where any staff member or student at the Aalto University can propose an idea related to online/blended learning and be considered for getting support in terms of design, technology or pedagogy together with funding to bring her/his idea to practice.

4. ENGAGING CO-CREATION AS A KEY FOR COMMUNITY BUILDING

The core idea for organizing A!OLE project already from the start has been to create a network - thus a community - of educational practitioners and teachers within the university. This way people are both available to coach other people but also to get coached on challenges they face when creating online educational materials, tooling and pedagogies. Indeed, collaboration via “communities of practice, multidisciplinary leadership groups and open social networks” (see Becker et al. 2017) are keys to facilitate teachers to learn from each other. Naturally coaching needs to be facilitated by *offering meaningful events* to meet others and learn what others expect and can offer. This supports bringing of learning and professional development to a collaborative framework and can empower teachers to use similar methods in their own teaching.

We have therefore organized A!OLE activities via engaging workshop style sessions and online tutoring resources. We have identified certain key themes as focus areas for these, currently including video production, virtual and augmented reality, online textbooks, automatic assessment, educational games and gamification, and finally generic flipped classroom and blended learning methods. In workshops and events we have introduced ongoing and forthcoming online learning projects. Further on, we have discussed motivations, experiences, on-line learning technologies and topics related to international collaboration.

We have recruited theme leaders to create sub communities for all these themes as an answer to the growing number of teachers directly involved within the A!OLE pilot activities (around 100 in March 2017). We have also recruited support people to help A!OLE pilots in different aspects on video production, automatic assessment tools and building interactive learning contents. Close collaboration with Aalto Learning Centre, the pedagogical training unit and Learning-IT services is also essential.

We have used these identified themes as a basis for our planning in an agile manner, thus identifying key challenges teachers have on producing online resources, and then timely providing solutions, accordingly. An example of this is providing teachers tips and methods how to present at the front of a video camera (like on postures, eye contact with the camera, composition) or enabling smart campus ideas via gamification and personalized information access. It is also important to present evidence on working pedagogical models and findings, e.g., that people concentrate better on short videos (see Guo et al., 2014). Further on, we have found out that the community building is greatly facilitated by the active use of spaces at the Aalto Learning Centre together with branding of time slots (preferably always the same space and time) for forums, workshops and studio sessions.

Events have provided to be very useful for community building and as inspiration sources. In December 2016 we organized in our new learning centre a large gala event¹ that gathered over 130 interested to join. In the gala we provided the results of A!OLE pilots via demos of online tools and materials, thus letting participants to try themselves different toolings. We had screens and poster stands gathered around themes. Further on, we employed the concept of “minute madness” and realized it as 45 second lightning talks by each of the 30 pilots of the year 2016. Figure 1 summarizes the three key event types employed by the project: annual, montly and weekly events.

¹ See <https://onlinelearning.aalto.fi/2016/11/27/aole-gala-december-20th/>



Figure 1: Three key event types employed for community building

5. POSITIVE, NEGATIVE AND INTERESTING ISSUES ON ONLINE LEARNING

We are building the project as a lean community-driven effort. This means in practice that we have employed workshop-style sessions to collect both emerging options and challenges related to online learning as seen by teachers and other stakeholders (like students or program directors). In this section we elaborate the findings according to PMI (plus, minus, interesting) method, where plus means positive issues, minus negative issues and finally also interesting opportunities are mentioned. We have collected these comments in various sessions either via SWOT-analyses, or via other intriguing methods (like questions on how students or teachers see the future of online learning). Table 1 shows the main results of these discussions.

Further on, the roadmap for AIOLE project includes to increasingly create measurable goals (e.g. via learning analytics) and thus build understanding of the impact of online learning options, development of funding instruments (like seed funding vs. cross school, big development projects), improving infrastructure (software, hardware and spaceware), leadership to foster transdisciplinary development and sharing educational resources and best practices, and ensuring commitment from departments for a longer time transformation of education. These, together with sensitivity and actions according to clear trends (like artificial intelligence, haptic interfaces, online & mobile as normal operations, see Adams Becker et al. 2017) in the higher education will continue to support Aalto University to offer engaging learning options for students and prepare them with skills needed by the ever-changing global society with grand challenges.

Table 1: PMI (Plus, minus and interesting) method used to categorize positive, negative and interesting issues related to online learning as emerged in our workshops

<i>Plus</i>	<i>Minus</i>	<i>Interesting</i>
Changing role of the teacher, teacher does not have to be just a talking head.	Education of teachers needs large-scale investments and methods to support them for the novel learning (both for online and active learning spaces).	Teachers and students get to learn in new collaborative, community-building ways. Redefinition of learning spaces is highly needed to enable interactive, learning-intensive workshop sessions.
Students are in any case looking for information online (Wikipedia, Youtube, etc.). Bring your own device (BYOD) culture is rapidly growing.	The amount of information – both correct and false information– is rapidly growing. Not all students have good enough, own computers and pads to participate teaching online.	More responsibility can be given to students on leading their learning. Further on, as we can evidence nature and sky contain huge amounts of information: can we learn from the nature to make very natural interfaces even for big data by using augmented and virtual reality tech?
Students can access learning anywhere, anytime.	The option to work 24/7 can potentially introduce stress.	Learning can happen in surprising new places, and in practice any places can be augmented for seamless learning.
The emerge of new technologies enable to put more effort on face to face sessions.	Teachers have raised the issues about non-working tech in classrooms (like a crashed projector) and online (like a relevant link not reachable). Teachers have too little personal experience in participating teaching that make use of online tools.	Augmented reality and virtual reality provide substantially different ways to learn both in situ, and also in 360 degrees, controlled environments.

5. CALL FOR IDEA PROPOSALS AS A GRASSROOT ACTIVITY

We have called now idea proposals on online learning in three rounds (April 2016, December 2016 and April 2017) from all people at the Aalto University, thus including faculty, program directors, researchers, staff and students. Via discussions and involvement of stakeholders we have selected the best ideas and invited people behind them to join the network of teachers in AIOLE. The network provides support on design, technology and pedagogy for teachers to realize the proposed idea in practice. After the evaluation of the ideas we have often discussed on funding to allow for full concentration on developing the idea to reality.

This may include funding in two phases. Seed funding will allow exploring and identifying appropriate tools, technologies, existing online resources and pedagogical principles on which to build a new AIOLE pilot. A part of seed funded phase is also to discover options for collaboration with existing AIOLE pilots. Further on, the seed funding is meant for preparing a better informed proposal in terms of the schedule and budget to support implementing the pilot idea. After this phase, augmented proposals need still to be separately accepted, but with a high potential for acceptance.

In Table 2 we summarize the main fourteen questions (Q1-Q14) in our call for idea proposals to illustrate the setting. The key idea is to encourage applications to consider and give arguments for the change in the learning process that the proposals aims to implement. Additional questions concern the ideas how the implementation would be carried out.

Table 2: Summarization of the main fourteen questions in our call for idea proposals.

Question

- Q1** *Please describe the current situation of the teaching related to the pilot (course, types of teaching, teaching material and which part of it is online material). Is there an identified problem in the current state of affairs that you are seeking to solve with the help of the pilot?*
- Q2** *Please explain the goal state - what will the teaching and learning at the course be when the pilot is finished? What are the essential changes to the current state of affairs? Which part of the current teaching / learning will move online or will be novel online activity? How the realisation of the pilot will improve learning and/or activities by the teacher/student?*
- Q3** *What kinds of activities for learning and teaching are you planning to develop in the pilot? For instance: Video production, Automatic assessment of exercises, Serious games, gamification, Virtual reality, Augmented reality, Online textbooks, Peer review*
- Q4** *How are you planning to evaluate the impact of the pilot for learning and teaching within the course?*
- Q5** *How could students participate in the pilot?*
- Q6** *How can the implementation of the idea change the online learning culture of the associated school/department/unit in the years to come?*
- Q7** *Which of your collaboration partners can support realization of the idea or take advantage of it?*
- Q8** *Are you planning to open the course online resources after the pilot or later on as MOOC to all interested?*
- Q9** *Who will participate the realization of the idea and in which roles?*

- Q10** *What kind of technical, design or pedagogical support (or something else) will you need to realize the idea?*
- Q11** *What kind of findings you have (or how are you planning to research) on tooling or materials that you could use for the pilot?*
- Q12** *Please explain which technologies (like online learning platforms, online-tooling, software) are you planning to use in the pilot. Please argue why exactly those.*
- Q13** *How your pilot can be linked our existing pilots? With which pilots are you planning to collaborate with?*
- Q14** *Are you aware of prototypes (e.g. online resources) that can give more information about the proposed idea and its goals?*

These questions have greatly supported us to select those ideas that best look for improvement of learning. For instance, comparing of answers to Q1 and Q2 should give an idea of the targeted delta of the idea proposal, similarly as the answers to Q4 provides insight on plans to evaluate the pilot. Q10 through Q12, and to some extent also Q14 are very useful in preparing our roadmap for selecting ideal online tooling and planning according support while Q6 and Q13 are all about community-building.

6. ONLINE VIDEOS AND NEW FRONTIERS

We have evidenced different forms of video production to be most prominently required by teachers. For this we have iteratively developed a model for helping teachers to gain skills and to aid them in the production. Our skill-building workshops have ranged from video script writing through presentation skills and use of a tele prompter use to animation creation and video sharing. We have also provided hands-on sessions on selecting appropriate licenses for works and informing about copyright issues. In all of the activities we have recorded the number of participants, and made decisions on next workshops and themes, accordingly.

Currently this has led us to focus especially on video presentation skills (like voice, postures and prompter use) and script writing as they gather most interest. Building of these skills are not well supported by existing units at the university, unlike for instance video sharing and copyright/license issues. Figure 2 gives an impression of the hands-on mentality at our workshops, showing how participants are using a tele prompter they have themselves built in the workshop. As a result of the enthusiasm and discussions on actual needs we bought a professional tele prompter from the market. However, building the tele prompter ourselves greatly supported understanding of what in fact is needed from a professional tool by our pilots.



Figure 2: Participants using a tele prompter they themselves built in a themed workshop on video production.

Emerging forms of educational videos that we have evidenced in our development and benchmarking activities include, but are not limited to, the following six kinds:

1. A talking head with slides, typically both shown at the same time or in sequence. Voice is used to explain the slides
2. A slide deck with a teacher explaining the slides with her/his voice
3. Animations, where various graphs or human-imitating characters are used to explain the study subject
4. Short plays where acting exemplifies some situation for learning (like for language learning, or for business case presentations)
5. Vlogs, where a teacher discusses relevant issues in a more natural-like settings (like explains theory, or gives task assignments or feedback on report/exercise submissions by students)
6. A tablet used as a whiteboard (like for explaining mathematical formulas)

The rapid movement to online videos has disrupted very fast traditional fields ranging from television production through cinema and music to videos supporting learning. Similar disruption is now already ongoing—potentially even faster than with videos—via the new frontiers of augmented and virtual reality together with games.

The virtualization ideas range from spatially mediated experiences via an augmented campus in order to learn languages to virtual realities made possible by 360 photo/video capture or custom-designed virtual space designs. At the same time students are also supported to get familiar with services offered by the university. Searching for information in situ at augmented and gamified university spaces—triggered by both places themselves but also by previously completed tasks—can enable students to get into rich contexts to support their learning.

7. CONCLUSIONS

In this paper we discussed our plans and activities to develop online and blended learning settings at the Aalto University to better target the both on-going massive digitalization transformation and improvement of learning. We reported about our goals to have a networked, active community of skilled teachers that are equipped with state-of-the-art tooling and platforms, and research-based evidence on working pedagogical models ranging from classrooms through online videos to augmented/virtual reality settings. In our vision this is best supported by gathering of emerging ideas as a grassroots activity and bringing people behind the ideas actively to form teams around our selected themes.

This way we wish to have in next few years hundreds of pilot projects from our all different schools, thus making the strategy implementation a rather unique, and truly transdisciplinary and interdisciplinary approach. A core part of the community-building are both online wikis and guidebook coupled with intensive, themed workshops that target skill development and joint creativity. As we reported, we build and evaluate workflows and concepts (like for educational video production) in an iterative fashion.

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