Designing Digital Higher Education: Case Aalto Online Learning

Tomi Kauppinen[1], Yulia Guseva[1], Sara Gottshalk[1], Lauri Malmi[1]

[1]Aalto Online Learning, Aalto University, Finland, firstname.lastname@aalto.fi

Keywords
Online Learning, Blended Learning, Higher Education, Case Study, Learning Experience Design

1. Summary

In this paper we report about a model and experiences in designing digital higher education. Our case is Aalto Online Learning—an Aalto University wide strategic initiative for educational development. Since the kickstart in year 2016 our activities have been to create online and blended learning experience designs, related learning materials and media, and as its foremost ambition to transform and improve educational setting and structures of the university and beyond. Instead of starting from a single platform or technology with all of its constraints, Aalto Online Learning starts from ideas to improve learning, and selects or develops a design to bring the idea to reality in an agile and collaborative activity. We have evaluated the whole process—from the call for idea proposals to funding, design, development and dissemination at courses—via nine consecutive rounds from early 2016 to early 2020. To overcome identified challenges in each round we have clarified the model, introduced new training and production approaches, and identified and ran online learning theme groups and development actions of needed tooling and platforms. The model has been used to identify learning improvement ideas and to develop them to solutions for over 200 courses at Aalto University.

2. Learning to co-create in collaboration with peers

Students seek for digital materials and tools to support them learning in a lifelong learning fashion where they can easily access contents both within courses and beyond. At the same time educators at universities and trainers in companies wish to learn how to create those contents, and use tools and platforms to edit and share them. The problem our society is facing is thus two-fold: 1) how to *train the educators/trainers* and also 2) how to *help learners to learn to learn*. We argue that it is necessary to substantially design digital higher education and understand what range of approaches are there to use and employ, and share training models and learning experience designs widely for others to learn from. In this paper we aim to do exactly that, and to improve learning at scale.

Figure 1 shows an overview of different approaches we have identified as learning related activities in Aalto Online Learning, the case study for this paper. For instance, there are a number of ways to represent information and knowledge for learners. However, for instance the production of professional videos requires a model to be followed. A video production model should include training, pre-production, recording, post-production and sharing (Guseva and Kauppinen, 2018).

Similar designs are needed for all different categories, for student inquiry, knowledge testing, knowledge application, reflection/documentation and feedback. Sometimes they can also be creatively combined, like in the case of the dynamic and visual self-assessment tool (see Kivimäki et al., 2018) or playable concepts (Kultima et al., 2020). In this paper we also report about the course design formats, assessment types and ways for automating course tasks and activities.

Our conclusion is that it is vital to identify the range of online approaches and systematically provide learning experience designs to all of them, and to create a community and network of practice to use those designs. In the case of Aalto Online Learning and its over 200 pilots[1] the range is quite full, from virtual reality to online textbooks and automatic assessment and from educational videos to serious games, or from online social interaction to location-based storytelling with augmented reality.

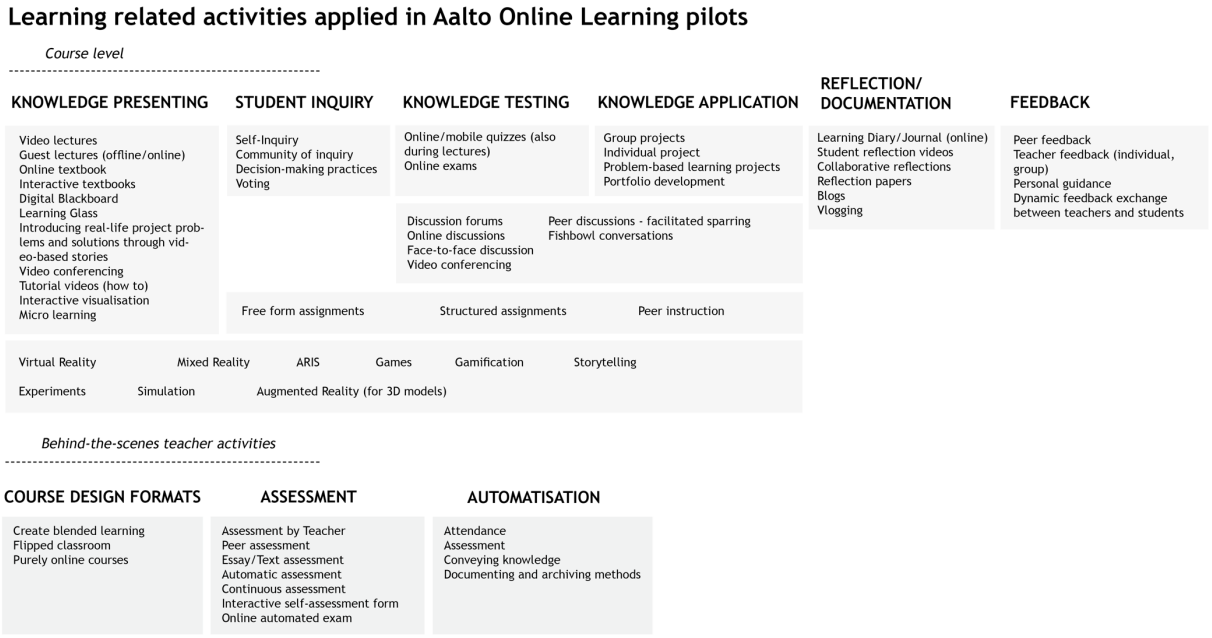

Figure 1 What kind of activities should support learners online, and improve learning?

3. REFERENCES

Guseva, Y. and Kauppinen, T. (2018). *Learning in the Era of Online Videos: How to Improve Teachers' Competencies of Producing Educational Videos*. In proceedings of the 4th International Conference on Higher Education Advances (HEAd'18), Valencia, Spain.

Kivimäki, V. Pesonen, J., Romanoff, J., Remes, H. and Kauppinen, T. (2018). *Supporting understanding of students' learning via visual self-assessment*. In Proceedings of EUNIS 2018 - Coming of Age in the Digital World, Paris, France.

Kultima, A., Lassheikki, C., Park, S. and Kauppinen, T. (2020). *Playable Concepts: Exploring Embedded Games for Education, Communication and Illustration*. In Proceedings of DiGRA 2020 conference, the Digital Games Research Association, Tampere, Finland. *(in press)*

Kauppinen, T. and Malmi, L. (2017). *Aalto Online Learning - a pathway to reforming education at the Aalto University*. In Proceedings of EUNIS 23rd Annual Congress (EUNIS2017) - Shaping the Digital Future of Universities, Münster, Germany.

[1] https://onlinelearning.aalto.fi/pilots

4. AUTHORS' BIOGRAPHIES

Tomi Kauppinen is a project leader and docent at the Aalto University School of Science in Finland. He holds a habilitation (2014) in geoinformatics from the University of Muenster in Germany, and a title of docent (2014) and a Ph.D. (2010) in media technology from the Aalto University, and M.Sc. (2004) in computer science from the University of Helsinki. From April 2014 to September 2014 he was appointed as the Cognitive Systems Substitute Professor at the University of Bremen in Germany, and since 2015 he is a Privatdozent in geoinformatics at the University of Muenster. His passion is to create, study and teach information visualization, spatial thinking, cognitive systems/artificial intelligence & blended learning design. Since 2016 Tomi is the project lead of the Aalto University wide strategic development initiative, Aalto Online Learning, which covers activities ranging from blended learning to fully online textbooks and exercices, and from video production to online social interaction, from artificial intelligence- based recommendations and assessment to interactive visual simulations, and from augmented/virtual reality to games and gamification. Tomi hosts the CloudReachers.com podcast. Contact: Tomi.Kauppinen@aalto.fi

Yulia Guseva is an online course producer at Aalto University. Yulia leads the video production theme group of Aalto Online Learning to advance and offer training and productions for our educators. Yulia holds a Master of Science in Economics and Business Administration from Universite Paris 12 - Val de Marney. Contact: Yulia.Guseva@aalto.fi

Sara Gottschalk is a Learning Experience Designer at Aalto University and a Junior Consultant at Leapfrog Projects. She holds a Bachelor of Arts degree in Digital Media / Interactive Media Design from University of Applied Sciences Darmstadt, and a Master of Arts degree in Collaborative and Industrial Design, with a minor in Creative Sustainability, from Aalto University. Sara is passionate about understanding human nature and applying the insights she finds into her design and project management work. With study and work experience from Germany, USA, Morocco, Kenya, Uganda and Finland, she is keen on utilising design and technology as tools for contributing to the sustainable development of our societies, as well as empowering people to make use of their highest potential. Topics that sometimes keep her awake at night revolve around learning, behaviour and systems change, and social and environmental impact. Contact: sara.gottschalk@aalto.fi

Lauri Malmi a professor of computer science at Aalto University. His main research area is computing education research, where he is leading Learning + Technology research group (LeTech). The main focus of the group has been development and evaluation of advanced learning environments and learning tools for programming education, e.g., tools for automatic assessment and feedback, and program and algorithm simulation and visualization. Malmi's additional research interests include as well as use of gamified approaches and educational technologies to support the teaching and learning process.

Malmi has been leading the national Center of Excellence in Education at Helsinki University of Technology in 2001-2006. He has chaired Koli Calling, international conference in computing education research in 2004 and 2008, and he is a frequent PC member in several other computing education research conferences. He is a member of the editorial board in IEEE Transactions of Learning Technologies, ACM Inroads and Informatics in Education. He is also a board member of SEFI Engineering Education Research working group and Nordic Network in Engineering Education. He has been leading several international doctoral consortia in computing education research and he has continuous interest in improving research training in computing and engineering education research.
Contact: Lauri.Malmi@aalto.fi