Building learning analytics cMOOC for teachers and learning designers through online collaboration between universities

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Abstract

In Finnish universities of applied sciences learning analytics has not been on the agenda until recent years. The activity is still largely based on individual teachers' enthusiasm and the faculty in general is not well aware of what learning analytics is about and what it can provide to teaching and learning. In recent years Finland has had several large national projects which are related to learning analytics. One of the first ones was "eAMK-project" in which Learning analytics was included as a minor part. In the project, it was soon realized that the knowledge and skills of an average teacher needs to be boosted in this field. Therefore, a cMOOC course was created – the very first in learning analytics in Finnish. The course is targeted mostly for teachers and learning designers. After completion of the course, participants should have the readiness to start using learning analytics in their work. Showing the mastery of the new skills, they are also encouraged to apply for "Expert in Learning Analytics" digital badge.

The course was developed collaboratively among six universities of applied sciences in Finland. The developers met each other periodically in face-to-face project meetings but most of the course construction work took place online. In this article, the structure and contents of the course are described. Also, the building process and the different elements and methods required for the online collaboration are explained. Before opening the course, it was evaluated using quality criteria for online implementations developed by national eAMK-project. The first implementation of the cMooc was held in spring 2019.

Keywords: cMOOC, online collaboration, learning analytics, co-teaching

1. Introduction

Learning analytics has been one of the emerging trends in education science in the last 10 years (See for example Slade & Prinsloo, 2013; de Freitas et al, 2015; Avella et al 2016), and it has found its way also to Finnish

educational environment. Activity around learning analytics has however been mostly based on individual teachers' enthusiasm, and general understanding of learning analytics and its inclusion into practical pedagogical tool sets of individual universities of applied sciences has been sporadic. Ministry of Education and Culture has tackled this problem by launching several large national projects related to learning analytics, including eAMK (eAMK, 2019a).

In eAMK project, a separate work group within one of project's main three themes was dedicated to questions related to learning analytics, and as one of its main tasks the group decided to design and implement an online learning analytics course targeted for teachers and learning designers. The course was created as a cMOOC distributed through Moodle platform. In this article, the design process for that cMOOC with necessary background context is provided, and challenges and successes from the process are discussed. In addition, some observed best practices concerning joint course creation through online collaboration between universities are presented.

2. Background

eAMK is a 3-year development project funded by the Ministry of Education and Culture. The project takes place between May 1, 2017 and April 30, 2020, and it has approximately 300 members from 23 (92%) universities of applied sciences as participants. In the project, "experts, students and working-life interest groups of universities of applied sciences will combine their strengths and renew both their mode of operation and learning" (eAMK, 2019a). The project is divided into three themes, the third one being about digitalisation of the university of applied sciences' pedagogy. Within this theme, the learning analytics was identified as one main focus point, and therefore a separate work group was created around it in the first joint meetings of the project through open invitation presented to all eAMK-participants. Role of learning analytics in the context of the entire eAMK project is presented in Figure 1. The learning analytics group raised wide interest and gathered around 12 active core members that came from 8 universities of applied sciences situated around Finland.

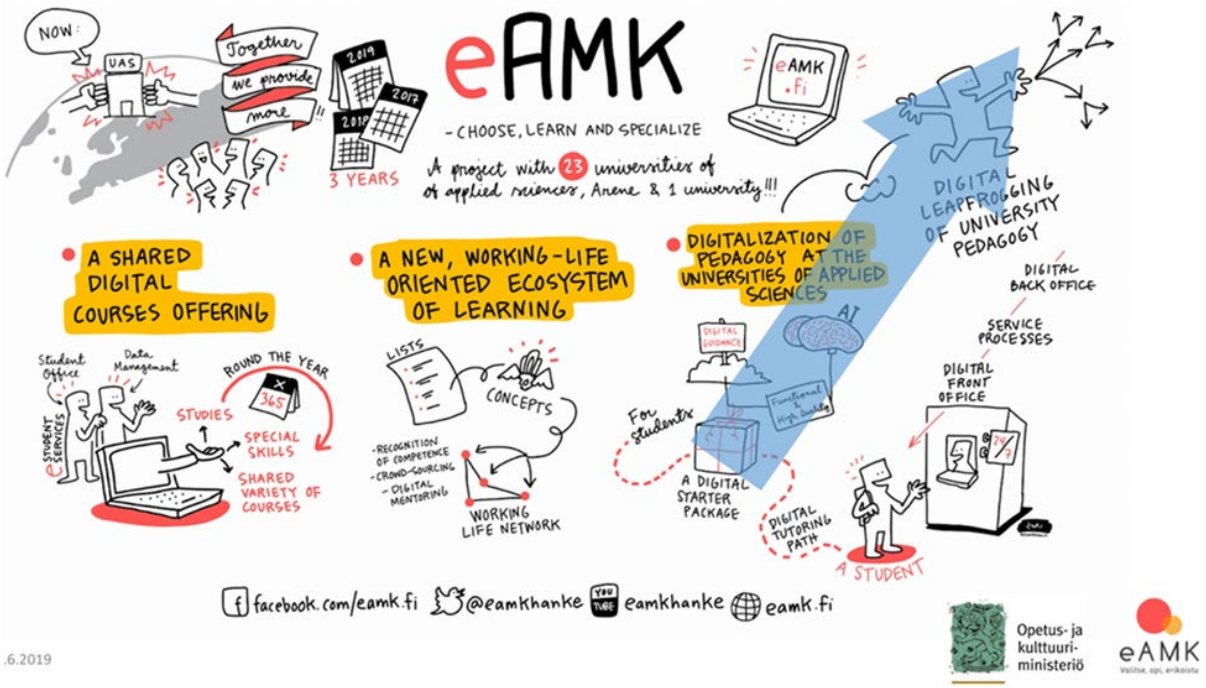

Figure 1: Role of learning analytics in the context of the entire eAMK project.

2.1 Goals of the learning analytics group

The eAMK project has identified two general level goals for the theme 3. The theme has been responsible for 1) improving digital competence within different higher education institutions (HEIs), and 2) ensuring digipedagogical know-how of HEIs´ educational staff (eAMK, 2019b). For learning analytics group this meant in practice helping teachers and learning designer in their efforts to introduce and further use learning analytics as a part of their everyday toolkit. In addition, the group was expected to provide support for student counselling through learning analytics.

When the learning analytics group started its operation in late Spring 2017, its members soon realized in their first work meetings that since learning analytics in Finnish educational environment is still quite a young phenomenon, as commented also for example by Auvinen (2017), there does not yet exist established consistent terminology to discuss different aspects of learning analytics and to share knowledge. This had been observed also by Finnish learning analytics network (Oppimisanalytiikkaverkosto, 2019). In addition, practical applications of learning analytics seemed for the group to be only a few, including for example Ville learning environment developed by Turku University (Laakso & al. 2018), and L.O.U.H.I, developed by Karelia University of Applied Sciences (Gröhn, 2019).

In order to best help teachers and educators with learning analytics, the group first therefore needed to identify the current state of learning analytics use in Finnish education field and map out available technical learning analytics tools and platforms. Based on the outcomes from these initial steps, actions for reaching the goals of the group could then be planned. In early Autumn 2017 group had one of its first face-to-face meetings, during which initial sketch for group's operational timeline (Figure 2) was created. Later the sketch was formulated into a Microsoft Project document presenting the goals and the needed actions (Figure 3).

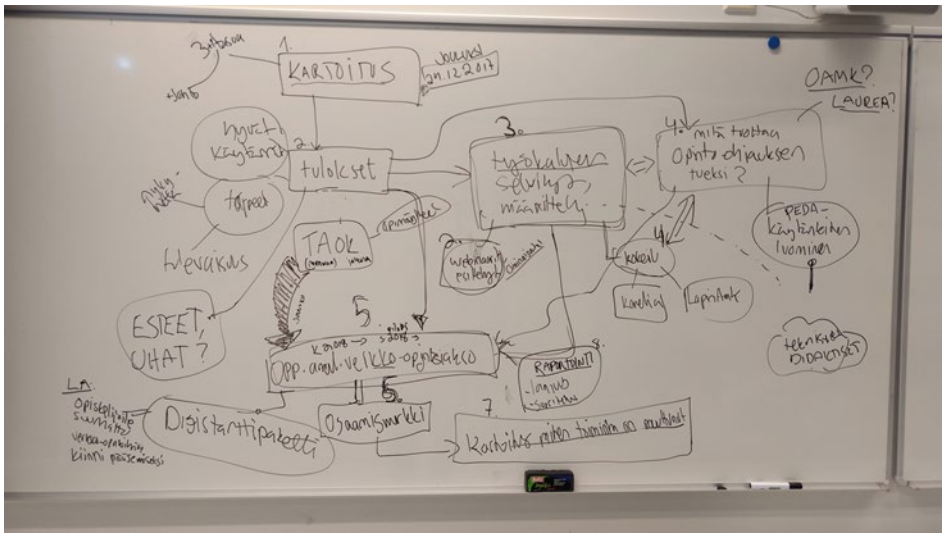

Figure 2: Initial sketch for learning analytics group's operational timeline

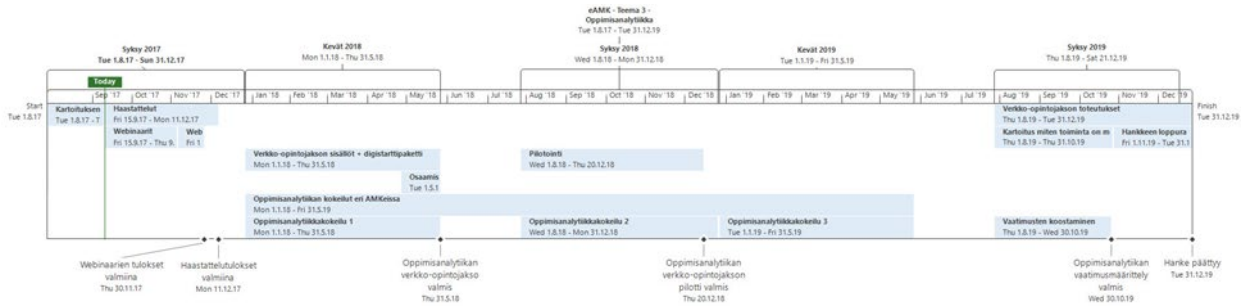

Figure 3: Analytics group's operational timeline as a Microsoft Project document.

In the timeline analytics group's activities were divided into four steps that were in chronological order 1) mapping out the current state of learning analytics use in Finnish universities, 2) benchmarking existing technical solutions for applying learning analytics in teaching and other educational activities, 3) creating an online learning analytics course (later cMOOC) targeted for teachers and learning designers, and 4) reporting the outcomes of the project to broader public. Steps 1 and 2 provided valuable and necessary background for the course creation process, which will be described in detail in the following chapters.

3. Establishing the method for course creation

After defining its goals, the learning analytics group put the timeline described above into action. Since the group was geographically dispersed, having members from 6 universities of Applied Sciences (Figure 4) that were located all around Finland, joint protocol for communication and collaboration was needed. In this case, group decided to rely mainly on Yammer social networking tool (provided by the eAMK project) as a discussion base, O365 OneDrive for sharing collaborative files and regular Skype-meetings for online communication. In addition, 1- to 2-day face-to-face working meetings were organized by the eAMK project approximately every 3 Months. These meetings also helped the group to work in cooperation with the other two themes.

Figure 4. The cMOOC was built in collaboration between six universities of applied sciences.

When the group had carried out its steps 1 and 2 during Autumn 2017, it turned its collective eyes into creating the learning analytics course in Spring 2018. During first more detailed discussions in working meetings held regularly through Skype and face-to-face, the group immediately faced a situation, where initial timetables needed to be re-planned. This was due to the question regarding how to reward students completing the cMOOC. This question proved to be a challenging one to address, since the target group for the course was so heterogeneous, coming from different institutions and different positions; for example teachers, administrative staff, learning designers, IT-support staff. After lengthy discussions, the group decided to use learning badges. If some institutions would want to provide credit units for participants taking the course and completing the badge, they could then do it at their end. In addition, the desire to have a learning analytics learning badge was presented from the eAMK project, so that the badge could be included into their learning badge family (eAMK, 2019c). The decision to have a learning badge created the need to design and have one ready during Spring 2018, which meant that actual design phase for the course itself shifted to Autumn 2018.

3.1 Creating a road map for online co-operation between workgroup members from different organizations

When the group started course design phase in Autumn 2018, a detailed road map for that particular task was created, and preconditions and needs for co-operation were identified. Group decided to 1) dedicate Autumn 2018 for course architecture design and content creation, 2) have the content evaluated against eAMK quality criteria in January 2019 (eAMK, 2019d), and 3) have first course implementation in Spring 2019.

When considering preconditions for course creation, group members run into a different situation compared to the earlier steps, were the work carried out by members from different institutions was by its nature more isolated and targeted either the institution itself (step 1) or a provider of technical learning analytics solution (step 2). In steps 1 and 2 Bulk of the work could be done separately and need to join the fruits of the labour existed only at the end, when reporting the results. Now the group faced the challenge of creating a joint uniform course design despite the fact that 1) the team was geographically dispersed, 2) it needed to work mostly separately, and 3) it had chances to meet face-to-face only approximately every 3-4 months. This challenge was (at least) two-fold; 1) how can the group communicate as instantly and as efficiently as possible and 2) how the group can share the artifacts being created during the collaborative design process as instantly and as efficiently as possible.

3.2 Deciding the communication protocol & the technical tools

During all steps, the group worked most of the time online. It was natural to choose the cloud-based tools for use of the group. Following requirements and objectives for the tools were identified by the group:

- Fluent information sharing between team members.
- Efficient and easy collaborative online working.
- 24/7 access to data and communication history.

The existing ways of communication and selected communication tools from steps 1 and 2, were found to have been well-functioning. The group did not find a need to change the communication protocol or add new tools even for this more collaboration intensive step 3.

However, in this 3rd step different members of the group did not work with their own contents in their own documents located in their own environments anymore. Instead, the content initially created by each member needed to be eventually included directly into the same course environment. To address this requirement, the group decided to use Moodle as their course platform, and had ensured its accessibility to all the content

creators from the very beginning of the course creation process. This enabled course content creation to take place directly inside the final course environment under collaborative critical observation, which helped in the efforts to ensure consistency and quality of the materials

4. Crafting the course

When the learning analytics group had created the roadmap and timeline for the course design, it was ready to continue with the course architecture design and content creation. Tasks included defining the learning objectives, defining the learning process and deciding on pedagogical model. In practice this meant choosing the course format, gathering and acquiring background materials, selecting the course platform, creating course topics and assignments, and implementing the evaluation process for the course.

4.1 Choosing the course format; cMOOC

Abbreviation MOOC comes from the term "Massive Open Online Course" (Kaplan A., Haenlein M., 2016). So, MOOC means an open and free network course for everybody. There are different types of MOOCs: cMOOCs and xMOOCs. xMOOCs (extended MOOCs) are more traditional learning approach of knowledge where participants watch videos and perform tasks that are automatically reviewed. The studying is independent. The letter C in front of the MOOC refers to concepts "Cooperative Learning", "Collaborative Learning". The letter 'C' may also refer to the concept "Connectivism" (Daniel, 2012).

"Basics of Learning Analytics" MOOCs course format was chosen to be cMOOC. Collaborative learning refers to acting and studying interactively, for example, in discussion areas where participants share information and ideas. It has been shown that use of Forums in MOOCs is correlated with better grades and higher retention (Coetzee, et al., 2014). Collaborative learning means communicating new knowledge and sharing expertise. Both ways of learning apply with this MOOC. In addition, participants also have the opportunity to personalize their knowledge. Working is based on independent work, but communal interaction and knowledge sharing are an essential part of the tasks.

The course was targeted mostly for university teachers and learning designers. The idea and goal was to 1) up-skill teachers and learning designers in the use of learning analytics, 2) to have as nationwide and as thorough coverage of participating educators as possible, and 3) to help in creating an active community of Finnish educators involved in learning analytics. For reaching these three goals, cMOOC format was found to be the proper choice.

4.2 Acquiring background materials

Through steps 1 and 2 group acquired valuable information about the current state and future plans of the learning analytics use in Finnish universities of applied sciences, and benchmarked existing technical solutions for learning analytics. Additionally, the group utilized a literature survey (Järvinen et al., 2018) about the current state of learning analytics in Finland, which was carried out by students of vocational teacher education in Tampere University of Applied Sciences and commissioned by the eAMK project. With this body of background materials, additional references and especially own experiences from different learning analytics pilots implemented during the eAMK project, the group was ready to move into making final decision(s) about the course platform(s) and then to creating the actual contents for the course.

4.3 Selecting the course platform

When deciding the course platform(s), the learning analytics group had following primary desires: 1) course should be easily available to any member of a Finnish educational institution, 2) course should support community building, and 3) course should be able to continue its existence also after the eAMK project and

without a centralized dedicated moderator. When examining these desires together, the group soon realized that the desires conflicted with each other in many challenging ways. At some point a dual platform model consisting of Moodle course environment already up and running by Tampere University of Applied Sciences and of a new LinkedIn group established by course creators was suggested. According to the dual model, Moodle (Figure 5) would host all the course materials and assignments, and as its final assignment would guide participants to join the LinkedIn group (Figure 6), which would this way become an independent self-sufficient community of learning analytics developers, users, and enthusiasts. This combination seemed to be able to address all the desires without causing unnecessary additional complexity into the course design.

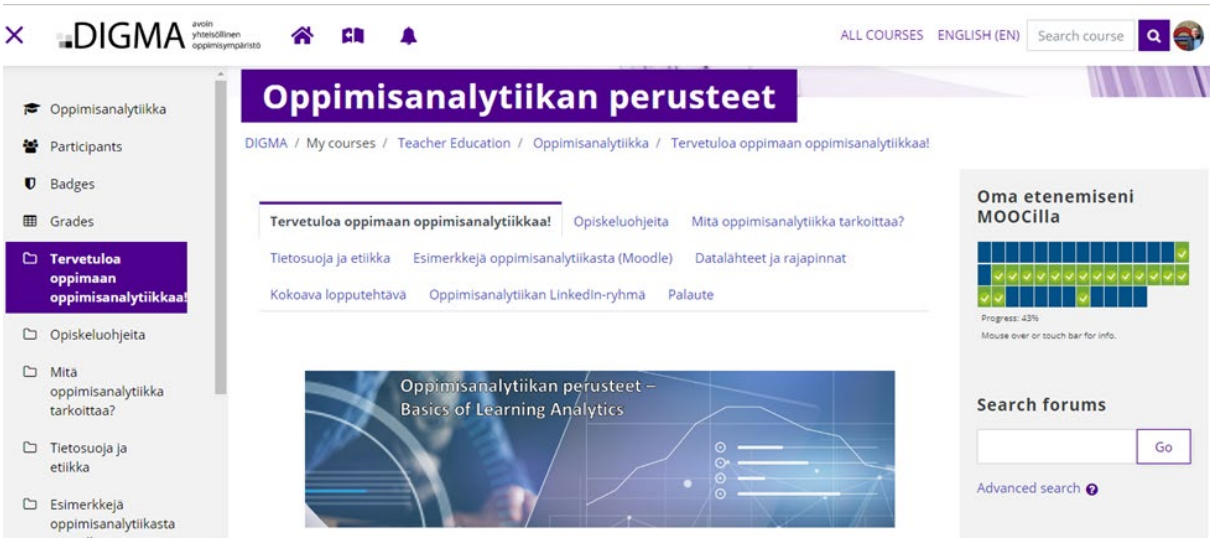

Figure 5. The team chose Moodle LMS to develop and define course content, track student progress, and measure and report student outcomes.

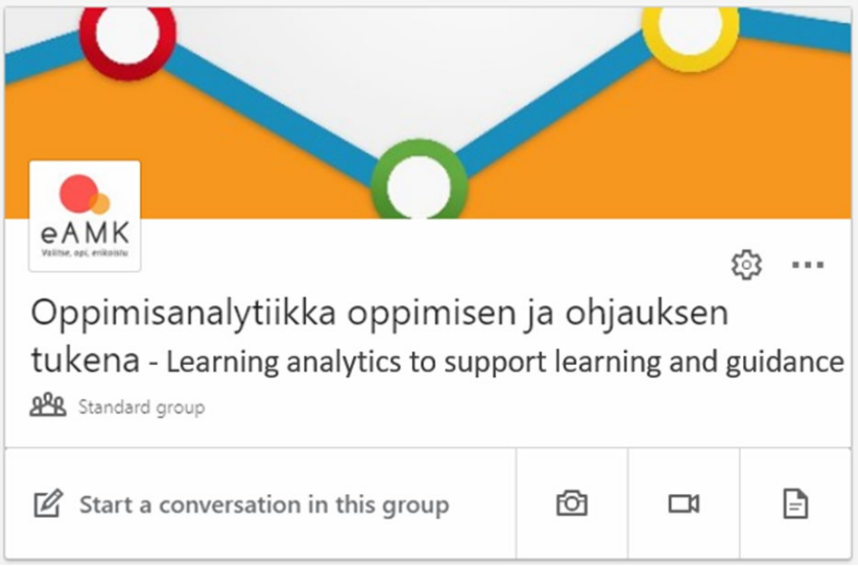

Figure 6. LinkedIN group is an independent self-sufficient community of learning analytics Developers (https://www.linkedin.com/groups/12123362/)

4.4 Creating course topics and assignments

When the group started creating the topics for the course, one of the first questions it needed to solve was how widely and to what extent different areas of learning analytics should be covered. Since the target

audience consisted of teachers and learning designers from any field and with various technical backgrounds, the group decided that the course itself should provide basic information about learning analytics with no requirements for previous knowledge on the topic. Following this general idea, the course was divided into six topics: What learning analytics means? data protection and ethics, examples on learning analytics with Moodle, data sources and interfaces, summarizing end assignment, and LinkedIn-group for learning analytics. After the topics were jointly decided, individual members of the learning analytics group selected individual topics to work with, based on their own interest, experience and expertise.

Since one of the goals of the course was to support community building, discussion forums with asynchronous peer commenting were preferred wherever it was reasonable. In topics that were more of a technical nature, also quizzes were used. This way the course design tried to strengthen the interactions between participants, so that when they completed the final assignment of joining the LinkedIn group for learning analytics, they would already have some existing culture of communication between them. Structure of the entire cMOOC is presented in Figure 7.

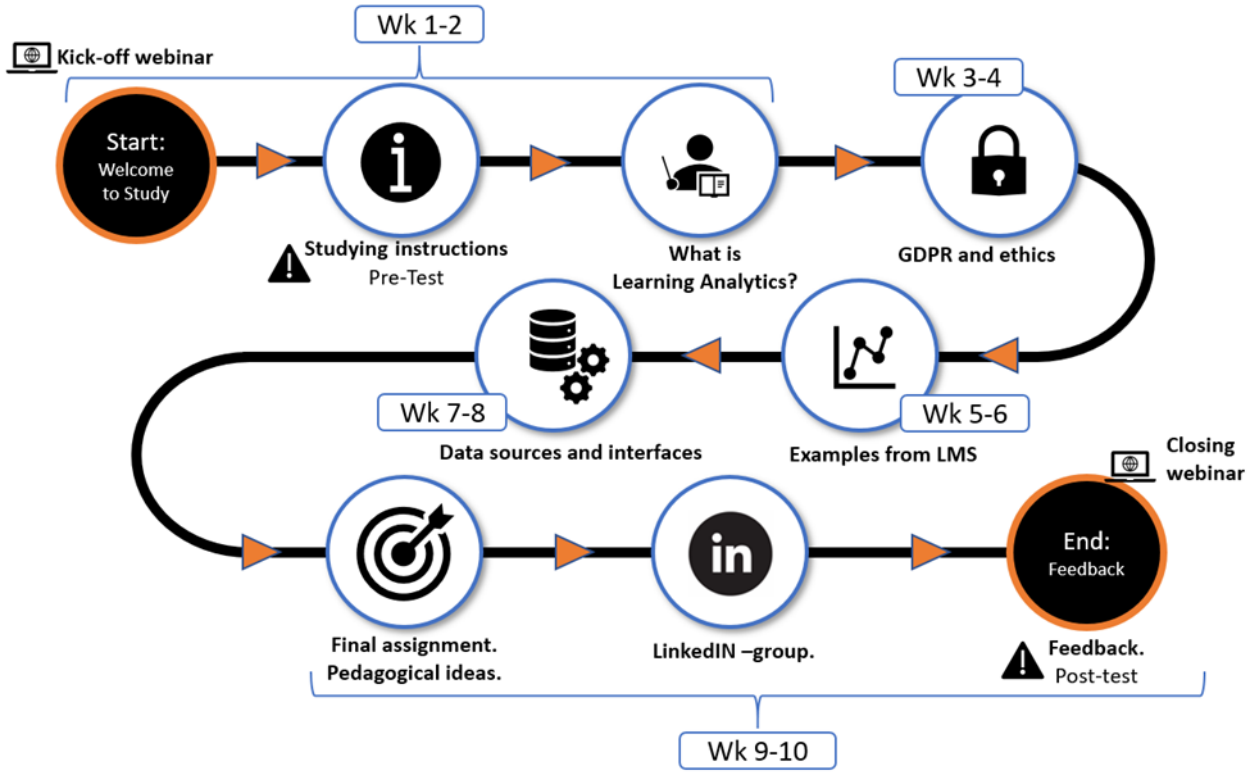

Figure 7. Structure of the cMOOC and week progress.

4.5 Defining the evaluation method for the course

There were wide discussions about grading the course by giving credit units of the cMOOC, but finally the group decided against it, and decided to utilize learning badges. Main reasons behind the decision were that in order to be able to give credits to participants, the cMOOC would have needed to be added to each university's curriculum or offered as an open course. This procedure would have also demanded the group to give the evaluation criteria to each university and find a resource to handle all the evaluations. Instead, the course was designed to be only material providing platform with only assignments that are reviewed automatically or marked as completed by the participant herself. When an individual participant wants to have the completed course graded and rewarded, she can apply for the expert in learning analytics badge, which is managed by the eAMK project and its possible successors.

Open Badges had also other benefits in addition to making the evaluating of this kind of a cMOOC course easier to manage. For example, Open Badges can be added to an electronic portfolio or CV, your own website, LinkedIn profile or your information in the staff Intranet. Open Badges allow teachers to demonstrate their skills and achievements to a future employer. Open Badges also promote awareness of colleagues' skills in working communities.

By completing the course and successfully acquiring the "Oppimisanalytiikan osaaja", "Expert in Learning Analytics" badge afterwards, teacher knows what learning analytics means. She understands what type of information is created in learning environments and systems to support teaching and, based on this knowledge, she is able to plan her own courses in a pedagogically meaningful way from the perspective of analytics. She is able to utilise analytical data in guiding students and monitoring the progress of their students.

5. Retrospective

In this chapter, we will consider challenges and successes the learning analytics group faced during the course creation process described above. We will also identify the key points ensuring the successful end result for the cMOOC that attracted 426 participants in its first scheduled implementation in Spring 2019. Analytics concerning this scheduled Finnish learning analytics cMooc are presented in another article ("Learning analytics of the first Finnish learning analytics cMOOC") in these same proceedings.

5.1 Challenges

During the course creation process, challenges emerged from the young age of learning analytics as a research field, and its lack of practical applications at least in Finnish educational environment. This meant that learning analytics is in general still quite unformulated topic with ambiguous use of terminology; how then can we make sure we speak a common language with each other and to the participants. Another challenge we faced was to be sure that we will cover all the necessary and relevant parts of the learning analytics in our course in adequate but not in unnecessary detailed level, especially since course's target group is quite heterogeneous. In order to address possible shortcomings in this regard, detailed student feedback was collected from the course and combined with analytics data collected by other means. This analytics data is presented and discussed in another article ("Learning analytics of the first Finnish learning analytics cMOOC") in these same proceedings. Possible future inclusions and exclusions of topics, and topics' reformulations for the course are done with the help of the feedback and analytics data. The third challenge was the cultural change from switching the credit unit points to an Open Badge. Open Badge also being a quite new way of acknowledge credits.

5.2 Successes

Roadmap and detailed background analysis carried out in steps 1 and 2 ensured straightforward design process for the course: One possible caveat for this kind of distributed design process are communicational challenges that can be caused by lack of know-how to use the technical tools. Group members had however good ICT skills, so the tools were deployed smoothly. This had surprisingly big significance to the success of the planning work and made flexible working culture possible in the group. The group worked efficiently using the cloud services e.g. Microsoft Office 365 and Google G-suite, supported by the communication in O365 Yammer. Big part of the success was played by the enthusiasm of the group members themselves.

Understanding the importance of education technology was a significant part of MOOCs development process. These skills also encouraged collaboration among peers. Technical and pedagogic challenges were solved together. Punya Mishra and Matthew J. Koehler's 2006 TPACK framework (Figure 8), which focuses on technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK), offered approach to

many of the dilemmas that our group faced in implementing educational technology (edtech) to MOOC (Mishra P. & Koehler, M., 2006).

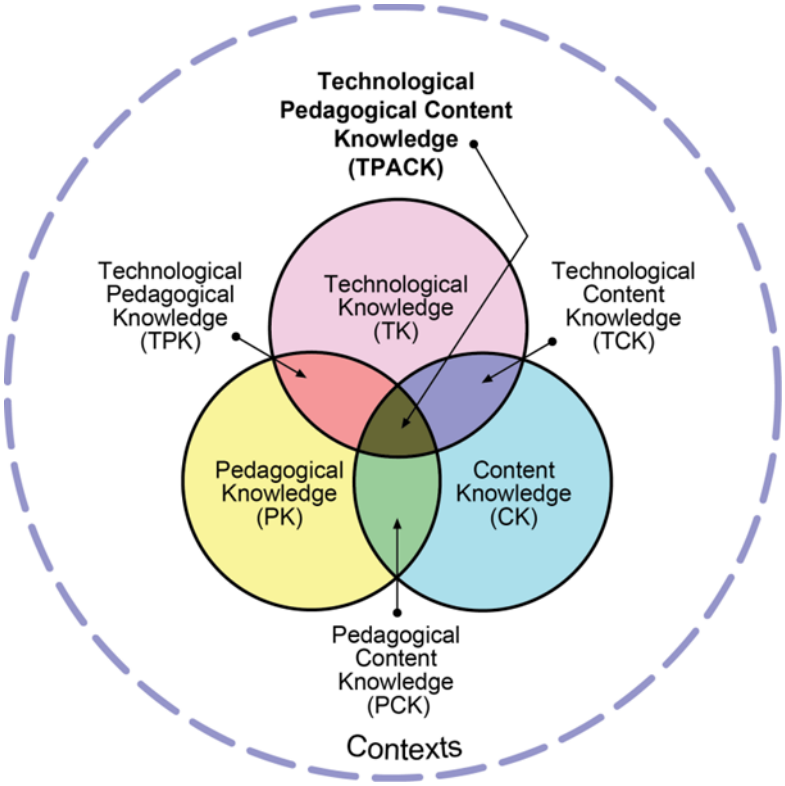

Figure 8: TPACK model (Koehler, M. & Mishra P., 2019) (Reproduced by permission of the publisher, © 2012 by tpack.org)

When evaluating the success of a design effort for the cMOOC, natural indicators are the observations made from the course itself. One goal for the course was to reach as many Finnish teachers and educational designers as possible, and to provide concise basic information about learning analytics to them. Another goal of the course was to remove ambiguity and unify the terminology around learning analytics in Finnish educational environment. Yet another goal for the course was to help in creating a diverse and active community of educational learning analytics developers and users. Detailed analytics about how the cMooc reached these goals can be found in another article ("Learning analytics of the first Finnish learning analytics cMOOC") in these same proceedings.

5.3 Suggestions for cross-institutional co-operation when building online cMOOCs

Online courses, such as cMOOCs, have established themselves as one popular mode of teaching. Often these by their nature cross-institutional web-based courses are designed and implemented within one educational institution or commercial actor. In the case of learning analytics cMOOC however, also the design and implementation phases were cross-institutional and web-based. With following considerations, the authors were able to ensure successful creation of a cMooc by a team of geographically dispersed educators with different backgrounds and from different universities:

- Even though educators in the group were from various fields, everyone had technical self-sufficiency in using technical tools (video conferencing, cloud services...) that are necessary to replace face-to-face communication as well as possible.

- In addition to the online work, it was quite clear that the first face-to-face meetings were essential to form the ground for the whole process. Everyone got to know each other, and an intense group was formed.
- The group organized its work in such a way that actual tasks were separated into different institutions as much as possible, while at the same time having a joint repository for all existing work documents for quick viewing and commenting by other group members. This enabled open work culture with joint ownership combined with clear individual responsibilities and ability to proceed with one's tasks efficiently.
- Online meetings in Skype were held steadily through the process which helped everybody to stay in touch with the process at all times.
- Creating the learning analytics cMOOC happened in the context of a large national project (eAMK) with adequate resources in the background. eAMK provided different necessary resources for the collaboration. These include for example budget for dedicated work hours and face-to-face meetings, and management of the learning badge.

6. Conclusions

In this article, a process of designing and building an online course for teachers and learning designers of Finnish universities of applied sciences was presented. Design and building process was carried out as online collaboration between six universities of applied sciences. At the end, a learning analytics cMOOC was created and made available to the target audience through Moodle environment along with a separate LinkedIn group. Participants successfully completing the course were able to apply for an Expert in Learning Analytics Open Badge.

Course design and creation process carried out through online collaboration between different institutions creates its own sets of challenges compared to the more typical situations, were courses are created offline and within the boundaries of one institution. However, by ensuring few important prerequisites presented here as best practices, one can face this set of challenges more successfully.

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