

Those partners that responded to the questionnaire included KCL, HB, CERTH, and B.USOC and the topics that were proposed were “Knowledge Organisation” (KCL, CERTH), “Dynamics of Knowledge Organisation” (HB, B.USOC) and “Sheer Curation” (KCL). In the production of a MOOC, the exact topic, content and other details of such a course was to be decided in consultation and collaboration with these colleagues.

Based on this discussion it was decided that the PMTP material on Dynamics of Knowledge Organisation should be repurposed for the MOOC.

A number of steps and **parallel** activities were initiated and/or continued. We were to:

- Investigate the availability of personnel to attend to the required work
- Continue the investigation of potential suitable platforms
- Find, contact, and seek relevant experience of others who have dealt with production of a MOOC
- Put in place an action plan
- Initiate the adaptation and development of the course content contents

Securing the availability of staff

A more serious consideration of MOOC production came late in the project. At that point most of the ordinary members were busy with other tasks in the project. Discussions were had with the HB management to make available time for a number of faculty members to conduct related tasks. A MOOC group was formed which continued with different related tasks. Regular meetings were set up in which all aspects of the MOOC production were discussed and tasks were allocated and performed.

MOOC platform investigations

Several different MOOC platforms were investigated including

- edX.org (Harvard, MIT etc)
- [Coursera.com](https://www.coursera.com) (also exclusive choice of partners- in Sweden only Lund University)
- [Google | Open Online Education](https://openonlineeducation.google.com)
- [Lynda.com](https://www.lynda.com) (Acquired by LinkedIn)
- [FutureLearn](https://www.futurelearn.com)
- [Udemy.com](https://www.udemy.com)

When it comes to edX.org, their course producing partners include Harvard and MIT, while some others such as Google’s Open Online Education are open to all. Our investigations showed that some of these platforms are restrictive and difficult to establish a relationship with and in some instances contact with the platform providers proved to be very difficult. For example, we initially did not get any response to our attempts to contact Coursera. Eventually after around a year of trying, we managed to find contact details for an actual person at Coursera through their only Swedish academic partner, University of Lund. Even then our inquiry about the possibility of publishing a course with them was not successful.

Considering the nature of the course we intended to develop we wanted a platform that typically published more advanced academic courses similar to what we had in mind. Therefore, some of the above and a few lesser known platforms we had found were excluded

as an option. Furthermore, after a series of communications, it became clear that the creation of our MOOC would not be possible on some of the other platforms due to the timeframe available, partly as reaching formal agreements between the university and the platform providers could be a lengthy process. We finally chose to work with FutureLearn and later Uдеми, as described later in this document.

Seeking advice and learning form earlier experiences

An early step in determining the feasibility of producing and offering a MOOC was to contact those with experience. We spoke with several colleagues at HB and KCL and reached out to external contacts (i.e. colleagues in Lund and Stockholm Universities in Sweden; University College and Trinity College Dublin; University of Oslo; University of Bristol; and a professor at Augusta University, USA with extensive experience with MOOCs) and gained insight into pedagogical and practical issues with MOOCs. These included the difficulty in determining the course's audience, the importance of fostering interactions among students, and the hallmarks of successful MOOC planners and instructors. This information-gathering step proved invaluable in the overall planning efforts.

Different insights were gained from contacting people with experience of MOOCs, and by the members of the MOOC producing team enrolling and attending a number of MOOCs on different platforms. Among others we learned:

- MOOC's are very demanding on instructors and personnel who must help with technology.
- Independent of how it is going to be used, do provide clear guidance on how it works.
- Do not assume that everyone knows what s/he is doing while accessing a MOOC.
- For a class, there will be several people all over the world. Thus, it is really hard to determine audience and to find the right tone.
- Questions posed by the instructors can be useful to engage students.
- It is also very nice to have office hours either with the instructor or with the tutors.
- Teaching through MOOCs is mostly done by the students who interact with the others.
- The guidelines on the level of lectures offered vary from platform to platform. In most lectures can be offered, but in some they are to be short and rather as a way of provoking conversation.
- Links can be provided to the various handouts, interviews with other people who are not instructors, but whose role is that of a guest speaker with expertise in a given area. Would be good to place textbooks online and provide free access to them during the course.
- The course work can be released on pre-given times, e.g. every Monday.
- Instructor could comment on various aspects and mention names of students who have made significant contributions to the chat the week prior.
- The chat can be organized by topics.
- The instructor can appear at the end of each week to summarize what has happened during the week. Similarly, the instructor can appear again at the start of each week to introduce the goals, activities for the following week.
- One could offer weekly graded quizzes, with multiple (e.g. three times) option to retake.

- There can be different levels of engagement or complexity to each activity. Interactions in the chat, could provide points given that the interaction is substantial or at the right level.
- There would be longer assignments, like developing a lesson plan. Students can be rubrics to grade other students' homework. The students can be randomly assigned.
- A BIG problem can be plagiarism. Some people can be very insensitive to other cultures and can be plain rude. The instructors have to have diplomatic tools to deal with both sides.
- The course can start with a needs analysis questionnaire, e.g. "why are you taking this course?" to help instructors to form an idea of student profiles.
- A course can typically start with a video intro, a glossary and a full list of info telling the students how they can participate in the learning experience as it progresses.
- There can be a chat for people to comment and provide feedback on each section of the course and an instructor could be available to reply.
- Some platforms and courses place a strong focus on engagement and offer many integrated access to other services and platforms (e.g. Facebook, google hangouts, twitter etc.) to promote participation and exchange of knowledge.
- At the end of the course students can be asked to share an example of their work to show what they have learnt.
- The course can be divided into weeks, where the section offered in each week can take a number of hours to complete.
- Typical time required for development of a MOOC can be anywhere from six months to a year.
- Production of MOOCs on some platforms can be free of charge while on others can require of an initial sum and an annual fee. In one of the cases we investigated, we received an offer of one-off single course for over 4,000€ and for a recurring partnership an annual cost of over 10,000€.
- The number of students attending each course can vary. On one platform, for a very popular course the maximum number of registered students was 440,000. The number of registrations for a typical course was given as around 10,000 with the expected 50% drop by the end of the course. For more advance courses similar to what we intended to offer, the number of potential registrations were estimated to be around 3,000 with far lesser number of drop-outs, that is, in such courses those who chose to complete the course were said to be a lot higher than in others.
- Most platforms offer easy to use content management systems (CMS) that allow partners to upload contents.
- Contents can be uploaded using a template.
- In many cases, the courses need to comply with the standards defined by the platform provider.
- On some platforms, new partners are offered a workshop that gives them an overview of how the module should be created and the quality standards.
- The partner should then provide a document outlining the structure of the course.
- Some courses can have a set time-span of a few weeks, but can be repeated. In others, there is no set time and the students can join and follow the course at their own pace. The latter form usually is mainly self-contained and requires very little engagement from potential instructors.
- Typically, the instructor, student interactions are not on a 1-2-1 basis.
- There is typically lighter or more comprehensive guidelines about the design of the course and the standards it should comply by. Most providers have some procedure for quality control before a course is published.

- At some platforms there is a timeline which specifies the steps in the process and the time required for each step, for example, promotion of a course is an step in the process that in one of the cases we investigated was very short and in another, it would start 3 months before the course launch.
- Some platforms enable the award of certificates and there may exist different levels of certification (for example a certificate for having completed at least 50% of the course, or an achievement of 90% or 100% completions). There could be different charges attached to these levels of certifications (for example, 25-35€ for 50% completion, and 40-60€ for 100% completion depending on the course).
- Multiple lecturers can be involved in the production of MOOC. While preparing contents, they are also encouraged to produce quiz, discussion topics, reading lists and the like related to their part of the course.
- Universities offering MOOCs, typically have a special central coordinator for MOOC and e-learning, and also project manager. The agreement of partnership with a platform provider is typically made at the university level.
- Typically a film producer/ editor is used. In one instance, one of our contacts estimated the budget for their productions of films to be around 100,000€ per film (which was a lot higher than other feedback we have received and was the case in our MOOC production).

Action plan

The following steps were outlined to support the planning and conduction of a MOOC and tied to an internal working timeline to keep the MOOC project on track.

- Establish a relationship with a MOOC platform
- Course design
 - Define the topic
 - Define learning objectives
 - Define audience
 - Students
 - Academics/professionals
 - Anyone?
- Identify instructors
 - Several instructors are needed
 - Variation is good (background, views, institution, country)
 - Identify guest speakers/interviews
- Determine objectives
- Determine contents
 - Open access articles
 - Multimedia
 - Conference recordings/proceedings
 - Video, interactive presentations, texts, simulations, tools
 - Leave room for learners to create and share
 - Content is starting point for learning conversations, plan promoting of these conversations
- Plan spaces of interaction
 - Distributed spaces via tags
 - Centralized spaces
 - Forums

- Daily email
 - Decentralized spaces
 - Blogs
 - Social media
- Plan interactions
 - Synchronous
 - Can be recorded so people in other time zones can view
 - Asynchronous
 - Trails (Diigo, social bookmarking website)
 - Tags
- Plan instructors' presence
 - Instructor is not central note
 - Instructor is active in forums, blogs, twitter, email, etc.
 - Be active but don't dominate conversation
- Plan learner creations/activities
 - Plan what learners should create, the "artifacts of sensemaking"
 - Promote peer feedback
- Promote and share
 - Students, colleagues, listservs, networks, conferences
- Set expectations
 - Size--doesn't matter?
 - Time—always more than expected
- Iterate and improve
 - Listen to course participants
 - Blog reflections/thoughts for feedback
- Investigate:
 - What resources when it comes to staff, time, etc. are necessary?
 - What financial resources are necessary for MOOC production and how will they be addressed?
 - What timeline is feasible for MOOC production and how does that fit with the resources available?

MOOC content plan

As mentioned above, after discussions with partners and investigation of the successful and common features of MOOCs, a plan was developed for the content of the MOOC. It was decided that we should re-purpose, adapt and re-use existing material, and based on those who were willing to be involved the topic of the MOOC became: **Dynamics of Knowledge organisation**

We already had a series of recordings on this topic as part of a module in PMTP, and we were running were running a PhD course on the same topic, these collectively would provide much of the material and design needed in this MOOC. However, the module in PMTP did not offer the interaction required in a MOOC, and the extent of the PhD course was far too broad for a few-weeks long MOOC. We decided to use the recorded lectures from the PMTP and include a few of the elements of PhD course. The PhD course was designed as follows:

PhD course Learning Outcomes

On completion of the course the students should be able to:

With respect to knowledge and understanding

- explain and account for the components of knowledge organisation affected by change, such as logical structures, indexing terminology, social context of knowledge, etc.
- demonstrate an improved understanding of similarities in, and applicability of, dynamics in deep structure in relation to surface morphologies

With respect to skills and abilities

- perform measurements in complex evolving knowledge environments
- develop new applications for accessing knowledge resources

With respect to professional judgments

- be able to assess independently and critically the strengths and limitations of a particular methodology related to evolving semantics
- be able to identify pertinent novel approaches to the problem of collection diagnostics

PhD course Contents

- Semantics and digital preservation: basic concepts, theories and trends
- Vectors and matrices: word and sentence meaning for advanced access to digital collections
- Vector fields: physics as a metaphor to model evolving semantics
- Detection, measurement, and interpretation of semantic drifts
- The Semantic Web and the emergence of ontologies
- Logic, ontology languages, and ontology engineering
- Ontology evolution and semantic drifts

Adaptation for MOOC

Subsequently, based on the above, the areas of study and contents of the MOOC were identified as follows:

The MOOC studies the involvement and application of semantics in Digital Preservation and focuses on two different but interrelated approaches: (a) vectors, matrices, and vector fields; (b) graph-based structures and ontologies.

Intended target audiences:

- PhD students and other researchers working on semantics who are interested in investigating the application of relevant methods and technologies in their specific fields
- Digital Preservation and Digital Humanities practitioners who are interested in investigating the deployment of semantics and relevant cutting-edge technologies

Expected learning outcome:

- Get a first glance at cutting-edge methods and technologies (semantic technologies, vector fields, ontologies)

- Relate theories of word meaning to vector-based information representation
- Learn about the foundations of the Semantic Web initiative and its core concepts and technologies
- Explore the relevance of semantic technologies to vastly interdisciplinary fields, like Digital Preservation
- Get a better view of the emerging paradigm of knowledge representation through ontologies
- Discuss how ontology evolution (i.e. the change of ontologies over time) can serve as a means for studying semantic drift

Parts/ activities:

1. Introduction
2. Basic concepts, theories and trends
3. Vectors and matrices: word meaning for advanced access
4. Vector fields: a new approach to evolving semantics
5. The Semantic Web & the Emergence of Ontologies
6. Semantic Technologies & DP
7. Evolving Semantics: Ontology Evolution & Semantic Drifts

Elements/ steps:

Each part in turn consisted of different steps that comprised of a combination of recorded lectures, discussions, reading and other texts.

As mentioned above it initially was decided to collaborate with FutureLearn (FL) (see also below). To ensure that the production of a MOOC would be at all feasible for that platform, there was a need to identify steps that would require time and commitment. As part of the planning the timeline the following check list was considered for this purpose.

It should be noted that the time-spans mentioned bellow, were tightened with special agreement with FL, due to the short time that we had at our disposal.

- Production of course description (including discussions among partners): two weeks
- Receiving approval from FL re course description: one week
- Course advertisement: two weeks
- Getting access to and learning about the production of material according to FL guidelines: three weeks
- Planning-meetings for HB staff from end of December 2016 to 8th of March
- Time planned for getting familiarized with FL platform and work with it, HB staff,
 - person 1:
 - person 2:
 - person 3:
- Technical help from HB- and CERTH staff,
 - Video cutting:
 - Video-branding:
 - New video production (later abandoned):
- Approval of the course by KCL: one week
- Approval of the course by FL: one week

Work with the FutureLearn platform

FutureLearn is an established platform that already had a working relationship with a partner in PERICLES, the King's College London. This relationship would facilitate and speed up the agreements needed for production of this course on the FutureLearn platform. A Centre of Excellent Proposal was formulated by HB informing FutureLearn about HB's Swedish School of Library and Information Science's leadership in the field of LIS. Based on this, it was accepted to publish a MOOC under the joint banner of PERICLES, HB, and KCL on FutureLearn. From this point on work was directed at the production of a MOOC for publication on FutureLearn. HB team gained a login and access to general information about MOOC production information on FutureLearn and the team started to both learn the requirements and prepare material to suit. However, a memorandum of understanding document was to be formulated by KCL that took more time than expected, and as part of that it was stated that we need to comply with KCL branding, however the branding specification took a few more weeks to arrive. The assumption at the time (based on the discussions that were had with KCL team members) was that this branding would mean adding a logo from KCL along side the other logos in our produced material.

Meanwhile the work on the adaptation of the recordings for the MOOC and creation of additional material and information continued by the HB team with contributions from the CERTH colleagues. By the time the branding information was provided by KCL much of the work was conducted and material prepared. However, the KCL branding requirements proved to be far more dominant than expected. While the MOOC was produced by collaboration between HB and CERTH, the opening and closing segments, as well as watermarking of every video clip, were to include KCL logo and/ or animations. These overshadowed the logos of the actual MOOC producers. This was something that the CERTH colleagues could not agree with. While the discussion between the two partners KCL and CERTH took place, the material continued to be prepared and finalized with the specified branding by both KCL and FutureLearn.

At this stage the course was designed to have a set period of two weeks, requiring around 15 hours of commitment from the learners. Around two hours of lectures, subdivided into seven activities and each activity subdivided into multiple steps were prepared. Week one was designed to start with an introductory section that would engage the students and encourage them to present themselves for one another. With that, the students were encouraged to engage in course related discussions. Detailed *instructions* were written about each *step*, describing what the 'step' was about, how it fitted with other *steps* and *parts*, the *purpose* with the step and *learning outcomes* as well as the *requirements* from the students. In relation to each lecture segment, *discussion questions* and *study group tasks* were prepared. The following images depict some of the material that was uploaded on the FutureLearn platform.

Vectors and matrices: word meaning for advanced access

This activity introduces the core ideas to represent word meaning by vectors, including a respective match between linguistics and information science.



1.11 VECTORS AND MATRICES VIDEO (15:01)

1.12 WORD MEANING FOR ADVANCE ACCESS VIDEO (10:12)

Vector fields: a new approach to evolving semantics

In this activity we will look into open-ended research questions and an ongoing effort to model semantic change on a vector field.



1.13 VECTOR FIELDS VIDEO (15:20)

1.14 VECTOR FIELDS - 2 VIDEO (09:35)

Move from FutureLearn to Udemy

Since the issue of branding did not get resolved between CERTH and KCL, by the end of the first week in March the idea of publishing the course on the FutureLearn platform via their partnership with KCL was abandoned and instead the CERTH colleagues investigated and opted for publication of the course on the Udemy platform. This decision again involved a speedy approval of the course by Udemy. All the recordings had to be re-branded. Due to closeness to the end of project and lack of time to adapt all the pedagogical design features of the already prepared material, only a slimmed-down version of the course could be published on Udemy to fit within the project time. CERTH colleagues took on the responsibility to create this version of the MOOC on Udemy platform with active contribution from one of the educators at HB.

This course can be found at this address: <https://www.udemy.com/dynamics-of-knowledge-organisation/>

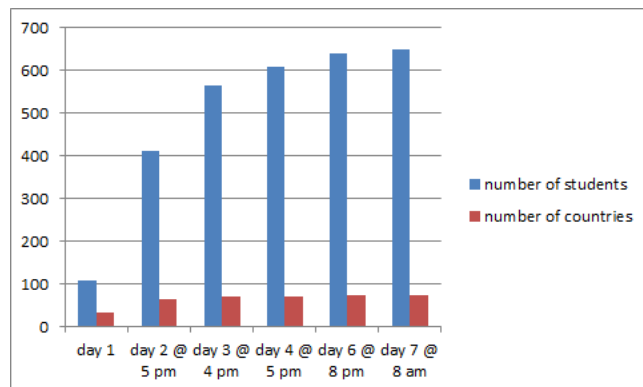
The specifics of the two MOOCs

- The MOOC for the FL platform was a fixed-length two week course, with the specific start and end dates set.
- That MOOC was quite structured, with clear steps for each of the two weeks with supporting text and material.
- Discussions and interactions were a central element in the course.
- It was planned that instructors would engage at least an hour a day to respond to potential questions and issues that may emerge.

- The UdeMy course has a floating structure; the learners can start and end the course as they wish.
- Except for the lectures, there are a set of multiple-choice questions. The response related to whether the answers are correct or not are given automatically.
- There is no interaction between the learner and instructors.
- The course on UdeMy went live on 20th of March 2017.
- One week after publication, 649 students from 73 countries had registered and were active in the course.

The following shows some of the facts about the course.

Time lapse	No of students	No of countries
Day 1	109	33
Day 2	411	64
Day 3	553	69
Day 6	641	73
Day 7	649	73



Popularity:

Asia (39 %)
US (14 %)

Country	% age
Thailand	17%
United States	14%
India	11%
Vietnam	8%
Pakistan	3%