

Course Sprints: Combining Teacher Training, Design Thinking and Hackathons

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Abstract. In this work we present a teaching support action – Course Sprint - for the design and implementation of a course in a new virtual classroom. A Course Sprint is an intense and collaborative activity that brings together educators and instructional designers experts in teaching and learning technologies. The main objective is to create or redesign a set of learning activities considering the defined learning objectives and competences in the teaching program using creative thinking. The need of such an activity originated with the deployment of a new learning environment: how to get teachers to adopt this updated virtual environment for teaching and learning? The new classroom is activity-centered as opposed to calendar-centered and, therefore, requires teachers to change the design of the course and the learning activities.

Keywords: collaborative learning, informal learning, online learning, instructional design, higher education, teacher training, coaching, continuous professional development.

1 Introduction

In order to adapt the instructional design to the constant changes of learners, the context, and the learning resources available teachers should review and redesign courses and activities constantly. Nevertheless, often the lack of time and support to undertake this redesign process pushes educators to repeat year after year the same learning process, using the same activities, content and strategies for teaching and learning.

Technology for teaching and learning is another element that is directly affecting the education sector and showing the importance of review teaching plans. As a result, in online learning, which is the case of our University, it is even more important to provide teachers with adequate support for redesign their courses efficiently.

Much of the design methodologies currently available are very time consuming and do not specifically take into account the teaching goals and competence level neither consider the most common possibility of having an existing learning design that needs to be redesigned.

In this work we present a teaching support action for the implementation of a subject in a new virtual classroom. Here the design of new virtual classroom works as a perfect excuse for teachers to review their instructional designs. We call this action “Course Sprint” (CS). A CS is a collaborative and intense activity with faculty members, tutors and instructional designers to (re) design the learning activities of a course in 4 hours taking into account the learning objectives of the course and the available technology for teaching and learning.

2 Background

For the ideation of the CS we considered the main characteristics of our context, our teacher’s needs and we analyzed current trends in support actions for instructional designers and continuous professional development for teachers.

2.1 Context

The Open University of Catalonia (<http://www.uoc.edu>) is a fully online university that develops all teaching and learning activities through a virtual campus. There are 256 faculty members from different departments responsible for the design, implementation and monitoring of the courses developed in the virtual classroom. Tutors are responsible for the class activity, the follow-up of the students’ learning process and the evaluation of continuous assessment exercises and final exams. Currently, we have 3.406 tutors for the 2.562 courses being offered.

The definition and design of the learning activities is often done collaboratively among faculty members and tutors as both are implied in the teaching process. Both teachers and tutors have a tight agenda, having little time for participating in long processes of instructional design. Also, the fact that tutors work totally online and have a full-time job – besides collaborating at the UOC - makes it difficult to find time for face to face meetings.

The rapid changes in technology and in online learning as well as the requirements brought by the European Higher Education Area (EHEA) [5] pushes for the constant evolution of the learning management system. As part of this evolution, a new classroom environment has been designed and iteratively improved during two academic years. For the current year, the goal was to have a more massive pilot of this new classroom. As a result, we designed several accompaniment actions to promote the change to this new classroom: from the more traditional and formal training sessions to Course Sprints. As a result, this new classroom is currently available in 333 subjects (13%), affecting 113 faculty members, 430 tutors and 14.510 students.

The new classroom is activity-centered as opposed to calendar-centered and, therefore, requires teachers to change their mindset and the design of the course. In consequence, the adoption of this new environment implies for educators to both learn a new web application and the (re)design the learning activities. Our goal was to design and implement the right accompaniment actions to help teachers in this process.

2.2 Instructional Design Theories and Models

Instructional design is a discipline aimed at the development of learning experiences and environments which promote the acquisition of specific knowledge and skill by students [10]. There are different design models that offer support and guidance for the creation of learning experiences. There are also other models of design not related directly with education that offers us good input: such as design thinking or lean entrepreneurship.

Many of the models are quite similar in that they essentially mostly address the same four components in some form or another: 1) the learners; 2) the learning objectives; 3) the method of instruction; and 4) some form of assessment or evaluation. Some of them such as ADDIE [6] are more focused on the process and others are more centered on working on the different components that compose the instruction like Dick and Carey Model [4]. Being these models very time consuming and very rigid in their implementation, some other models were proposed based on flexibility and iterative processes like Kemp's Model [12] or Rapid Prototyping Model [11].

The IMS Learning Design specification [8] was also taken into account. This specification is able to use any pedagogical model to get units of learning run-able and editable in an interoperable way. IMS-LD augments other well-known e-learning specifications aforementioned, like SCORM, IMS Content Packaging, IMS Question and Test Interoperability or IMS Simple Sequencing. Furthermore, IMS-LD describes among other things the roles, the activities, the basic information structure, the communication among different roles and users; and all these under the pedagogical approach decided by the teacher and-or the e learning designer. Although it seems like a good approach to consider in our online learning environment, the IMS-LD is too complex and theoretical and the software available to help create learning objects is not mature enough.

These models as such were discarded as an option to promote the adoption of the new virtual environment. Teachers would not take the time to go through the documentation and the training was too theoretical and far from the real implementation problems. However, we did get inputs and insights to help us shape the support action we were aiming for.

Other less education related approaches like Design Thinking [3] also provide an adequate framework. However, again, the process spreads over time and, as a result, requires too much involvement for teachers. Our goal was to design a solution that would provide a one-time and not too long involvement; instead of day-long or sessions spread during different days. Design thinking promotes the combination of empathy for the context of a problem, creativity in the generation of insights and solutions, and rationality to analyze and fit solutions to the context. All these elements as well as the creativity aspect are important for the design of the learning activities support.

Lean Entrepreneurship and its uses in education were analyzed as well as the T-PACK methodology and the ISTE coaching proposal. The Lean Startup [9] provides a scientific approach to creating and managing startups with the goal of offering a

desired product to customers' hands faster. The Lean Startup (LS) method is about how to drive a startup-how to steer, when to turn, and when to persevere-and grow a business with maximum acceleration. It is a principled approach to new product development. A core component of Lean Startup methodology is the build-measure-learn feedback loop. This makes the LS very interesting in education as a perfect way of constantly evaluating the learning experiences adapting it to learners and context. In this sense, it is similar to the iterative nature of design thinking and more generally of user-centered design approaches.

The Technological Pedagogical Content Knowledge (TPACK) model [14] attempts to identify the nature of knowledge required by teachers for technology integration in their teaching, while addressing the complex, multifaceted and situated nature of teacher knowledge. An possible solution for the implementation of a TPACK model are the technology coaches defined by ISTE [13]; who assist teachers in using technology effectively for assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences for all students.

All these different models, theories and approaches to instructional design helped us better design the accompaniment action and take the aspects and ideas that best fit our context and the needs and characteristics of faculty members and tutors.

Being a multidisciplinary department with many of its members software developers, we also looked at agile methodologies and especially at hackathons [7] which are collaborative and intense activities. During these events, computer programmers and other profiles involved in software development, including graphic designers, interface designers and project managers, collaborate intensively on software projects. The focus is on producing an end-product by the end of the event. This specific characteristic was key in the type of action we were looking for.

Booksprints [1] are similar to hackathons, they bring together a group to produce a book in 3-5 days. There are five main parts of a Book Sprint:

1. Concept Mapping: development of themes, concepts, ideas, developing ownership, etc.
2. Structuring: creating chapter headings, dividing the work, scoping the book (in Booktype, for example).
3. Writing: distributing sections/chapters, writing and discussion, but mostly writing.
4. Composition: iterative process of re-structure, checking, discussing, copy editing, and proofing.
5. Publication

This structure was also very useful and adequate to the (re)design of learning activities and can be mapped to the process of creating these activities and then implementing them into the new classroom.

3 Characteristics of the New Support Action

Learning from the several aspects we gathered from current instructional design models as well as software and design development processes together with our

specific context and end-users, the new support action for faculty members and tutors had to cover the following characteristics and aspects:

- Promote adoption of the new virtual classroom environment. Now is activity-centered as opposed to calendar-centered and, therefore, requires teachers to change their mindset and the design of the course.
- Train faculty members and tutors about this new classroom and its characteristics.
- Short and self-contained. The lack of time of our target users and the fact that they are spread in different locations are a big constraint.
- Different agents implied in the design of each course/subject. In our university there are two different agents responsible of designing and teaching in each subject: The teacher and the tutor. Both teachers and tutors assist to the Course Sprint.
- Awareness of the students' needs as well as the differences between teachers of different departments and with a diverse interest in learning technology. Teachers need different types of support depending on the characteristics of the subjects they teach and also the students' needs. There are subjects that are completely new, others that are already designed but need some revision. There are some subjects with big number of desertion, others that are well considered but have not been revised for a long period of time, for instance.

4 The Course Sprint Structure

During Course Sprints [2] faculty members and tutors design the learning activities taking into account the learning objectives of the course and also the competences students have to acquire during the semester. Contents are considered as resources for students to solve the activities and not as the main tool of the learning process. We also offer teachers the possibility of including Open Educational Resources as reliable material that can be included to help students to work the activities of the minor.

The 4-hours session is structured in the following phases:

1. Introduction of the new virtual classroom and the teaching and learning tools available in the virtual classroom (wikis, blogs, microblogs, etc.). During 30 minutes we make an introduction to the new classroom for teachers to familiarize with the new classroom design.
2. Analysis of the virtual mind map created with the goals and competences that the course needs to cover. Before the brainstorming activity, we introduce the mind map we have created for the session. The main map is based on goals and skills that the course/subject needs to cover and want to help teachers to think about possible learning activities.
3. Brainstorming of learning activities based on the mind map. Using the virtual mind mapping tool, teachers include, first, individually, afterwards as a group and during

- 30 minutes, all the activities they think are adequate for students to achieve the goals and skills established. This stage of the session is very important as usually teachers establish the activities based on content and not on goals and skills. It requires them to define activities from a new point of view.
4. Introduction to Open Educational Resources (OER) research techniques. Library staff explain basic research techniques for teachers to be autonomous to find and include OER in their learning activities.
 5. Selection of the learning activities to design. Using the virtual mind map, faculty members and tutors explain the activities he/she have added to the map trying to find similar ones proposed by others and trying also to estimate the time required to the student and its place in the course planning. We define a group of parameters for each activity: public/private, product (final result of the activity), individual/group.
 6. Design of activities. From the selection made in step 5, we organize teachers in groups for developing the activities using the templates previously prepared. In this template we propose a flexible organization for the description of each activity.
 7. Search for online resources to complement the activities. A specialist in documentation and OER research is present during the session helping teachers find new resources associate to the activities they propose. These resources are a complement to the mandatory material associated to the course or subject. It is also a good moment for teachers to ask doubts about research techniques to the specialist.
 8. Publish the activities in the new virtual classroom. Once the activities are developed, teacher access to the new classroom and published it. Teacher learns with this practical exercise how the new classroom works acquiring the basic knowledge for being autonomous in the management of their virtual classrooms.

In order to prepare each session and adapt the structure to the specific needs and characteristics of the teachers and the course, previous to running a Course Sprint, it is very important to meet faculty members to know their concrete needs for adapting the sessions. Depending on that some of the phases of the CS were longer, shorter or eliminated.

As mentioned for step 2, also previous to the Course Sprint, we create some documentation that was used for the dynamic of the sessions. First of all, we create an online collaborative space for the brainstorming phase. This space is configured specially for each course we are going to work. Here, we include objectives (blue in the figure) and skills (black in the figure) that had to be worked in the concrete subject. All this information is taken from the syllabus that faculty members previously facilitate us.

During the session – stage 3 - teachers create the possible activities (pink in the figure) they are going to work with students taking into account the desired learning goals and competences. This online system offers us the possibility of working first in an individual way and collaboratively afterwards.

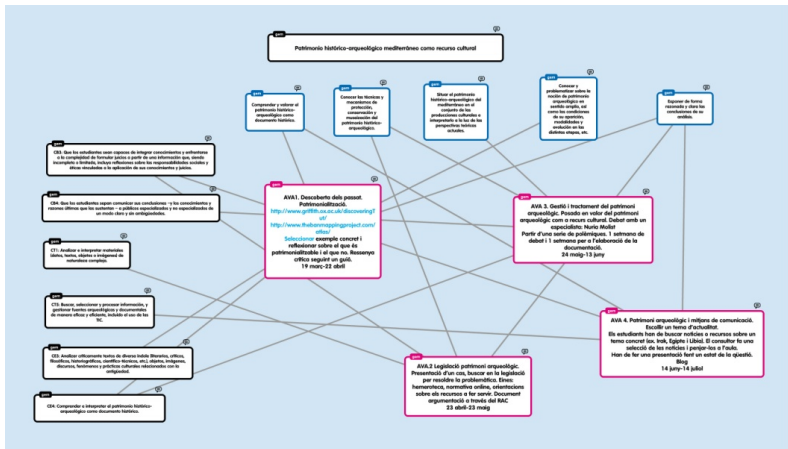


Fig. 1.

We have also created templates for the design of the activities phase. In this phase, teachers, based on the brainstorming phase, select and develop the activities that are going to be part of their course. Here we work the concrete definition of each activity using the template as a way of helping teachers to refine each activity description. Some sections are suggested in the templates for the definition of each activity: Description and instructions; Objectives; Skills; Contents; Materials and resources; Teaching and learning tools; Important dates; Dedication and pending issues. These sections are just a starting point, teachers can change them if needed.

All this material stays available for teachers to be used after the CS session.

5 Evaluation and Results

We have run 21 Course Sprints with 71 teachers from different specialties during the 4 months previous to the start of the semester; which is when teachers revise the syllabus and learning activities of their courses. Most of the sessions were face to face. However, when there were tutors that could not assist, we offered them to participate via a videoconferencing tool.

The evaluation of the CS experience has been made using qualitative, informal and quantitative methods collecting data with different instruments.

We created a questionnaire in which we asked about different aspects of the CS: utility of the CS, relation between time spent and benefits, methodology valuation, resources evaluation, utility of the products of the session and an open-ended question about possible improvements of the CS. The figures below show the responses of 16 of the participants.

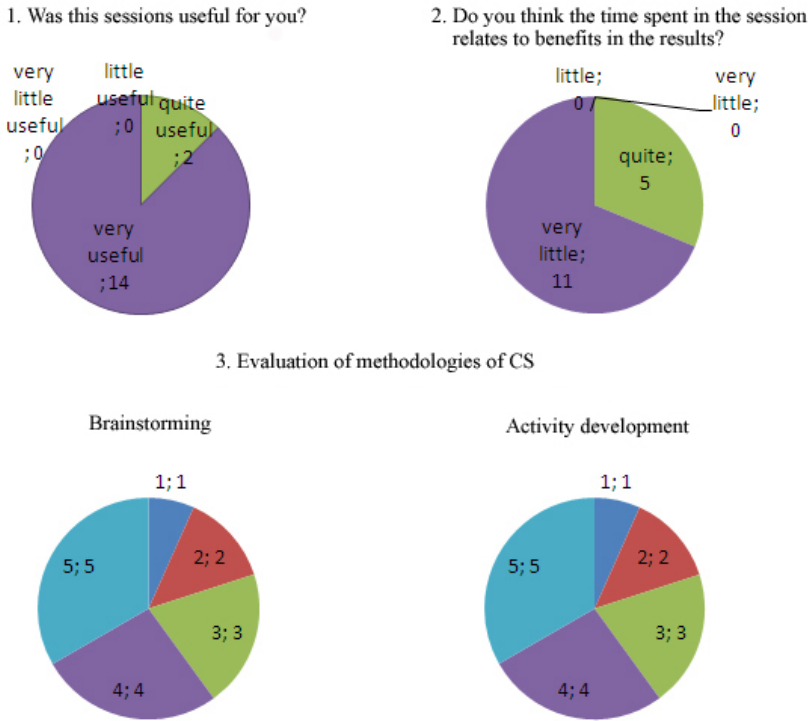


Fig. 2.

At the open-ended question about possible improvements of the CS, teachers gave us positive feedback about the adequacy of the session to the established goals. Also gave us some ideas for the improvement of the session related especially with the length, proposing doing the CS in 2 sessions for example or working part of the session online before the face to face meeting. On the other hand they valued punctuality and organization the most.

From the feedback on the sessions, we gather that the experience has been very positive. In a short period of time, teachers get to know the new environment, (re)design the learning activities and have the virtual classroom ready to start the semester. We have also seen that teachers that do not go through this course have a hard time when they switch to the new classroom. When they go through the Course Sprint previously, they already know the new system and it was much easier to adapt and guide their students though the new interface and their functionalities.

Also, the more Course Sprints we made the more we learn about teachers and their needs. That offers us the possibility get data to keep working on the enhancement of both the virtual learning environment and tools and the accompaniment actions we offer.

6 Conclusions

Technology by itself does not change the teaching methodology and practice. In this paper we have presented how we have created a support action to use the changes made in our learning environment as a perfect reason to motivate teachers to rethink their teaching tools and methodologies. Our goal was to support teachers in the design of the courses and learning activities. We do not expect them to learn first about instructional design or the available teaching and learning technologies.

The method itself very flexible, and has allowed us to place the focus on specific aspects depending on the needs of the participants by adding or removing time from others. The situation of the programs, subjects or teachers may be very different from one another, and in this sense the CS has demonstrated to easily meet the needs of each session. For example, some teachers may require support in the definition of learning objectives, while others may only be interested to focus in the design of innovative learning activities. Other teachers come with a clear idea on what they want to do, but they need to know which ICT tools can be used for their ideas.

A really interesting collateral effect of this collaborative activity with the educators and instructional designers is that they are obliged to deal together with most of the issues of that course, and this is a way to make communication flow and share important aspects of that course. Making decisions in a group is also a way to make teachers more comfortable with their tasks and make sure all the participants in the course design share a particular view.

Another parallel effect is that, by supporting a teacher on the course design of a specific subject, probably we will be indirectly improving other subjects he or she is teaching. Based on our experiences, the sessions with teachers made new ideas emerge in our teachers' minds, and many of them may take advantage of these ideas to introduce changes in other subjects. Besides, at the end, the best impact is done on the students, who will enjoy of a better learning experience.

Course Sprint sessions are teacher training sessions. In this sense, CS is a powerful contribution to the teacher training programme in a particular institution, with the added value that as you train a teacher, you are also getting a subject designed. This is an essential factor to consider: teachers will be more engaged and open to teacher training actions if they can see that the training provides a useful product for them.

The role of the facilitator, coach or expert in educational sciences and ICT is the most appropriate to support teachers in CS sessions. These facilitators need to learn about the course to be (re)designed, have a clear idea of the competences and objectives related to it, and think of a methodology or potential activities to reach the learning objectives. The knowledge about a considerable range of ICT tools is necessary as well as the most important pedagogical strategies. Creativity, spontaneity, real listening skills and flexibility are some of the essential abilities that this facilitator should bring to the process.

These conclusions will be widen once the courses that were designed through CS are finished. By that time, we will be able to collect data about the evaluation of such courses and then we will compare it with the same course designed without the CS session. For now, we know that the experience is positive for educators and helps

accomplish our main goal: to facilitate the adoption of the new classroom through a short and hands-on activity so educators would both get to know the environment and (re)design the learning activities.

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