

Deploying a SPOC creation strategy at UPMC

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Abstract. We present an important initiative of implementation of SPOCs (small private online courses) by the ODL department at UPMC (University Pierre et Marie Curie) for the entire program of a first year of Bachelor of Science and Technology. We first describe the contents of our SPOCs and the pedagogical choices we made. Then, we detail the creation of the courses, the production of instructional videos as well as the interest and engagement of the teachers in this project. Finally, we discuss our educational aims and we present the first results of the deployment of the SPOC. It appears that this initiative has had a positive impact on the engagement of the ODL students. The new learning environment is appreciated by a large majority of students participating in a first survey. This project will be continued and improved with the help of evidence-based research at the ODL department of UPMC. The future outcome should also influence and improve the traditional way of teaching.

1 Introduction

As part of its training policy, our university, (UPMC) undertook the development of SPOC, in particular for the first year Bachelor's degree students. This project, carried out by the Open and Distance Learning Department, was supported by the programme of Excellent Initiatives of Sorbonne Universites. It is part of the global project to renew the pedagogical resources and course design of UPMC. Until last year, the distance learning students followed their courses in a rather traditional way even if they had access to the university's LMS platform. The proposed course resources were the text notes of the course, the list of assessments to be handed over during the semester and eventually other online external resources that each professor considered useful. Students could interact via a forum shared by all the ODL students (first and second year bachelor's degree) The proposal and decision to create private online courses (SPOCs) had a twofold aim: the modernisation of online teaching and the transformation of the traditional on-campus teaching practices considered as almost exclusively transmissive, even though a few teachers were offering an on-campus active pedagogy. In this context, our project aspired to develop a pedagogical design frame and process for the SPOCs. It also took into

account the educational advances provided by the technological evolution. The SPOCs, adapted from the MOOC framework, offer diversified modes of learning to all students of the university. We first present the SPOC device as it was conceived for the distance learning. In a second section, we discuss and evaluate the process of designing and producing teaching videos. Finally, we present our first feedback on the resources created and therefore on the project.

2 The SPOC, a proposition for the distance learning

The SPOC¹ [1, 2] are complete, hybrid courses, teaching devices intended initially for the students of the PCGI portal² in the first year of the Bachelor of Science and Technology degree. What is UPMC's educational design of its SPOC? At UPMC the SPOCs are conceived and designed as equivalent to the on-campus courses proposing the same amount of ECTS. This pedagogical framework responds to the need of the distance learning students and functions as autonomous courses.

The ODL students follow their SPOC courses online and present themselves for the on-campus or proctored exams. For the moment, at UPMC, the SPOCs are not used during the semester for blended learning by the on-campus students, contrary to some of its variants, like the Université Catholique de Louvain's SPOC track [3] or the Universidad Politécnica de Madrid's [4]. The exams are simultaneous and identical for all students, ODL and on-campus ones. If the subject includes mandatory laboratory courses, for example chemistry or physics, the ODL students have to attend on-campus teaching (one week twice a year: first in January and second in May). The semestral exams of all courses are in May and June.

The SPOCs aggregate many multimedia resources - classic, technological or numerical - to concretise the chosen pedagogical strategies for meeting the needs of distance students. This includes a better comprehension of the scientific concepts, decreasing the dropout rate and creating a cohesion between students.

Each course is divided into 8 to 9 chapters (called episodes), for the 12 weeks of each course. For the ODL students we propose a self-paced course allowing them to have access during the whole year and managing better their engagement in the courses. Students can find in every course written materials like lecture notes and textbook with two correction levels (with hints). Short videos qualitatively elaborated and carefully scripted explaining specific theoretical or methodological points of the course are also at their disposal. Moreover quizzes and exercises on WIMS (an interactive multi purpose server that proposes quantity of exercises easily configured and randomised) allow students to proceed in a formative or summative self-evaluation and allow tutors to have an insight of the student's progress. The students can also find several multimedia resources like filmed scientific experiments or interesting external sites. Several activities are equally proposed on the LMS of the university for a collaboration between students, such as forums, creation of a glossary, a wiki, etc. For each course an introductory chapter, the course map, proposes all the essential information, that students have to

¹ For the creation of our SPOC the ODL department was inspired from the experiences of the ETHZ, and the Universidad Carlos III de Madrid.

² Physique, Chimie, Géosciences et Ingénierie, portal's title which stands for Physics, Chemistry, Geosciences and Engineering

know, as well as the detailed programme and calendar of the course. Teaching teams offer tutoring to off-campus students and exchange with them via the available tools (forum, chat, emails, simultaneous online meeting tools creating virtual classes), on the follow-up of the course or on the homework to be handed over.

3 Developing and producing the SPOC at the UPMC

The SPOC are undoubtedly the result of a joint effort of several key players. The main ones are the teachers, designers and guarantors of the scientific content. Equally importantly, the pedagogical engineers have accompanied the teaching teams, participating actively in the scenario and the design of the entire course. Several other services of the university are involved, in particular the people who filmed and edited the videos.

For the principal actors, the teachers participating in the project, a novel approach to the teaching preparation was necessary. An up-front preparation of the entire course allowed the definition of the course map, the creation of a syllabus and the explicit mention of the prerequisites and the expected outcomes. For this new course design, novel collaborations had to be implemented, especially between the teachers and the education engineers for the preparation of different resources. Short instructional videos for pedagogical purposes were clearly a new interesting challenge.

The instructional videos we proposed for the SPOCs were in a different format from that of a classroom course shot in an auditorium. We decided that each instructional video will present a key element of the course, a difficult point of the subject that students find tricky. In order to ensure that students follow with attention the whole video, we restricted their duration to 5 to 8 minutes in average. This restriction of presentation time was in itself a difficult exercise, as was the choice of the controlled environment of a studio for the shooting of videos. The well known environment of the classroom and the usual teaching attitude in front of a live public were replaced by a green background, cameras and several lights as well as a prepared scenario to follow. Similarly, the creation of the written materials used during filming had to be reflected from a visual and design point of view, taking into account the new tools used. We wanted the videos to be really clear for the students, because the filmed scientific concepts were quite difficult (mathematics, physics, mechanics, electronics and chemistry). We decided to offer the students the possibility to follow the entire process of thinking, analysing and resolving the presented problems by example. Teachers had to be able to present in a parallel and a simultaneous manner the oral and written explanations on the video in order to maximise the comprehension and assimilation. For this purpose we used a graphic tablet. Teachers could add handwritten annotations live during the shooting. This decision implied that the written content used during the shooting, as well as the oral discourse, had to be carefully designed and scripted by defining clearly the importance of each element and by choosing the appropriate channel of explanation (oral, written or both). It was also very important that each video, meaning each pedagogical unit, could stand on its own, as an autonomous educational resource allowing the repeated use for constructing new courses.

4 Our procedure for preparing instructional videos

After a first experience of producing short videos, we realised that teachers had to work more closely with the pedagogical engineers in preparing their videos. For this we chose the case study as a pedagogical strategy and approach. We created a realistic display, a small studio, for helping teachers practicing in front of the camera with the material and software they would use. We worked on an existing resource prepared for the on-campus teaching and tried to script together and progressively the support slides as well as the oral presentation. We filmed the rehearsal sessions allowing the teachers to check the appropriate transmission of the scientific content and giving them a first idea of the result. These ‘light’ shooting sessions have been very helpful in improving the quality of the scientific content of the videos, in increasing the ability to use the tablet and in improving the teacher performance in front of a camera. The availability and sensitivity to our mutual concerns established a good collaboration between the teams. This spirit was important for the continuation of the project, the mastery of the difficulties and its final completion.

5 The use of SPOC for the on-campus teaching

After the completion of a first wave of SPOC in autumn 2015, we have the first feedbacks on this work from the teachers. Teaching teams in all the scientific fields were very interested in proposing all or part of the SPOCs resources for their on-campus courses and each team opted for different uses of this material.

For example, a flipped classroom model [5] is used for the on-campus students by proposing multimedia material before the course [6]. At the beginning of the lecture course, a short quiz is proposed to verify the students’ engagement and their understanding of the scientific notions. The scope for the teaching team is to go further on the course and concentrate more time on exercises and practical cases. It leads to a more active participation from the students. Other groups of teachers prefer to give access to these resources only after the first final exam (in December or January) in order to help preparing the second session of the exams (in June). Those supports are also included in new university projects where the instructional videos are proposed as complementary resources for better understanding notions and to acquire good practices [7, 8].

This progressive use of SPOCs in the face-to-face teaching permits us to say that today 1300 students can potentially have access to the educational material already in use.

6 Evaluation and first results

SPOCs have been available online since October 2016 for about 150 to 200 ODL students, depending on the course. It was the first semester that we proposed courses with this new educational design on a large scale. A pilot course run last semester and the first results were encouraging. The final exams for the first and second semesters for the ODL students will be in May and June 2017. Today, we have some feedback on this work from the teachers and the students. The teaching teams are satisfied with this work and the

results presented. For example, for the mechanics ODL course, last year the first graded homework was completed by only 50% of the students, this year the 73% of the effectives handed over their first homework. These initial statistics permits to hope that the SPOCs will be an advantage in increasing the involvement of the students and help to decrease the dropout rate. We also noticed that forums are more solicited than before.

Besides the impressions of the teachers, the first feedbacks from the students are favourable on the quality, the utility of the resources as well as on the educational design chosen. As it is the first year of availability, we can only present few results from a survey about this project and the educational design applied. About a third of the ODL students has answered at the time of writing, meaning around 50 students. The instructional videos seem to be watched by the students, as we can see from the analytics proposed on YouTube where we hosted our videos. Asking the students to rate their answers to a scale 1 to 5 we received the following evaluations. The presented results are percentage of the notes equal or superior to 3. 93.7% of the students rated favorably the provided resources (courses, videos, exercises, scientific content, tools...). 91.8% of them found the short videos useful for a better comprehension of the course [9]. Only half of the students declared following the videos until the very end. 86.7% of the questioned students found the quizzes useful for self-evaluating their level of comprehension.

A large majority consider the proposed resources sufficient. They would be eager to participate actively in the definition of the subjects for the future videos resources. Similar unanimous positive comments come out on our questions about the usefulness of tutoring and the need of quick feedback responses from the teachers.

7 Conclusion

We can summarize the outcomes of this first experiment by a sentence that came out frequently out of the survey we presented to the students “we want more videos, and more courses in this format”.

The presented results seem to validate our first choices and reinforce the decisions made until now. The test of improving the engagement is successfully passed. The test of improving the results will be set at the end of the academical year. We will proceed with a more in-depth evaluation [10] of these educational devices and take into account the results for bringing eventual readjustments. The need for a continuous research on innovation in education in our university is stated. We have to implement more tools for an evidence-based improvement of our resources. This should allow a fine-tuning of our pedagogy.

Nevertheless, all the indicators collected are a clear encouragement for continuing towards similar projects and prepare online courses that better meet the needs and expectations of our students while enhancing the commitments proposed by UPMC and its teaching teams.

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