HES-SO MOOC 'Distributed Flip' Model: A Pilot Experiment

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Abstract—**This paper presents a pilot experiment conducted by the University of Applied Sciences Western Switzerland (HES-SO)[1] to embed one of its own MOOC into face-to-face course in the Business Information Technology Bachelor curriculum. The proposed model is that of a distributed flipped MOOC. Various statistics drawn from the MOOC and the students' evaluations are presented here to assess the validity and the impact of such a model to evaluate its potential for a global diffusion across the whole establishment.**

Index Terms—**MOOC, blended learning, distributed flip model, pilot experiment.**

I. BACKGROUND

20000 (27% of all Swiss UAS students) learners enroll every year in the different curricula proposed by the University of Applied Sciences Western Switzerland. This university, settled in the French part of Switzerland, offers students strong references to the real professional world, either by linking the teaching laboratories with practical experiments or by developing projects with professionals in action. Since 2004, the HES-SO e-learning center Cyberlearn has been in charge of developing and conducting research in blended learning, along with the pedagogical use of new innovative technologies.

Since 2011, distance education has been reshaped by the onset of a new type of teaching: the Massive Open Online Courses (MOOCs). These courses are considered as a disruptive innovation to bring reform in higher education.

MOOCs enable a mostly free access to higher-level education for many self-motivated [1] people worldwide. Hundreds of such courses are nowadays developed by universities from all over the world, particularly by prestigious American universities, such as Stanford or Harvard, while[2] more than 35 million people worldwide have attended a MOOC in 2015 and more than 2 million among those have successfully completed a course with certification.

In 2014, the HES-SO Board of Education decided to develop a MOOC pilot project by Cyberlearn and to host the products stemming from this project on a local platform[3].

[1]Quoted as HES-SO in the document
[2]https://www.edsurge.com/news/2015-12-28-moocs-in-2015-breaking-down-the-numbers
[3]moodecX: fork of Moodle, dedicated to host MOOCs : infos here : http://www.moodec.ch

Platforms hosting MOOCs are legion, but the most famous (Coursera, edX) remain closed to universities with local reach. As the HES-SO was created in 1998, its international expansion is just beginning, thus these platforms remain out of reach.

This pilot project was designed to test three issues. Firstly, to verify if the effort required for such a development is worthwhile, secondly to measure how far the project can reach outside the establishment, and thirdly to assess the re-usability of the "home-made" MOOCs in face-to-face classroom teaching. The purpose of this paper is to provide information on how this MOOC can be embedded in a specific face-to-face classroom course and to present the reactions and feedback from the students involved in this project.

II. EMBEDDING A MOOC IN A BLENDED LEARNING APPROACH

With its six faculties, the HES-SO offers wide curricula ranging from Design and Fine Arts to Social Works, Business, Management and Services, not forgetting Engineering and Architecture, Music and Performing Arts and even Health. For this pilot project on the MOOCs, two main topics were selected: health and oral communication.

This paper describes the MOOC dedicated to oral communication. Targeted at people in need of having to produce speeches, such as the students at the HES-SO or other universities, the "short method to improve oral communication for stressed people" takes place over a four week period.

In February 2016, 198 people attended this MOOC, 4.93% completed the course and obtained a certificate, while 32% were still active during the last week of the course.

Caulfield *et al.* [2], Firmin *et al.* [3], Griffiths *et al.* [4] all experimented the integration of MOOCs provided by various universities into their face-to-face teaching.

Koller [5] noted that MOOCs present an opportunity for reinforce face-to-face classes. This approach is called "distributed flip" [2]. It enables professors to mix high quality on-line content, scientifically validated as often stemming from prestigious universities, with face-to-face activities proposed and supported by the professor. Our aim was to experiment the embedding of a HES-SO MOOC into a face-to-face class, in the form of a prototype. The MOOC on oral communication was thus selected to be integrated into a face-to-face class of a course of the same name taught on campus. The second phase of the experiment consisted in verifying whether the students, mostly with an apprenticeship background, would show a sufficient level of independence

to attend part of the course at a distance.

A. Related Courses

The self-motivated [6], [7] face-to-face course takes place during 16 weeks, 3 hours a week. It includes compulsory on-going assessments and a final examination. When the module is validated, the students obtain 2 ECTS credits in Fig. 1. This course concerns the Business Information Technology School and is taught during the second semester of the first year of the Bachelor. A majority of students are male (90%) and belong to the 19-25 age group.

The topics covered in the MOOC overlap with those addressed in class, which are charism, gesture, rhetoric, story-telling and stress management. The MOOC is structured simply and mixes fiction film clips with theory provided by the professor, and practical exercises[4] The delivered knowledge consists in 44 videos, 5 quizzes, 8 workshops of which 2 are compulsory for the MOOC to be validated. Peer-grading is used for the workshops: each participant must publish 2 productions and assess the productions of 3 other participants, using the provided evaluation grid. This training takes place over 30 hours of course. (16hrs on-line, and 14hrs personal effort) and corresponds to 1 ECTS credit[5] in Fig. 1. It is not an official credit recognized by the HES-SO. If the course is completed successfully, the participant obtains a certificate of achievement, else only a certificate of completion is delivered, which can be downloaded via a personal access code.
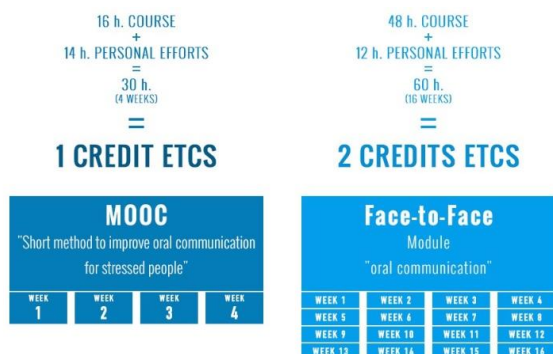

Fig. 1. Comparison between MOOC and face to face course.

III. THE EXPERIMENT: FROM 22 FEBRUARY 2016 TO 13 JUNE 2016

We decided to interface the MOOC with that of the face-to-face class as in Fig. 2. Therefore, we replicated the MOOC so that only regular students can subscribe, because we wanted to ensure coherence between distance and regular course.

Students can access to the MOOC via the LMS Moodle, used by the HES-SO faculties since 2006. The MOOC structure was replicated in the Moodle course, which usually supplements the face-to-face course. Physical attendance to the course was downsized from 3hrs/week to 2hrs/week. As attending the MOOC required completion outside face-to-face class, it was made compulsory in order to

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[4]to access to HES-SO Moocs : http://moocs.hes-so.ch
[5]http://ec.europa.eu/education/ects/ects_en.htm

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validate the teaching hour shifted to the MOOC. In case a student had never accessed the MOOC, he would obtain grade 1 out of 6; when the MOOC was attended and the activities completed without obtaining validation, he would be graded 3 out of 6, and if validation was successfully obtained he would be graded 6 out 6. This grade counts for half of the mid-module assessment grading.
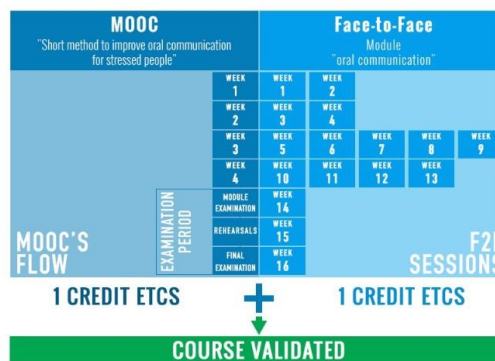

Fig. 2. Structure MOOC-F2F.

During their first face-to-face class session, the students were warned they would attend a pilot course. Participation conditions were explained, the weekly deadlines clearly presented to them.

The theoretical components and the practical exercises completed during the face-to-face course were adapted to the expected pace of the course. As in most MOOCs, the « short method to improve oral communication for stressed people » was run in an automated manner, without interference from the professor or a moderator. However, a computer scientist in charge of the technical aspects, could be contacted if needed. Several students made use of this possibility to ask for delayed submission of their assignments. We accepted one delayed submission per student. A second submission delay would result in failing the course, and students were duly informed they would obtain grade 3.

A. Figures and Facts

48 students participated in this experiment. 35 obtained the certificate of validation and grade 6, while 10 obtained grade 3 and 1 was given grade 1.

In order to apprehend the students' behavior, the platform logs were analyzed. The majority of students (18.6%) accessed the MOOC between 8am and 10am, the next largest group (16.7%) between 2pm and 4pm and 16.7% accessed between 4pm and 6pm. About 6% accessed after 11pm, for 2.5% before 8am. A large majority of students were connected during the week and on Sundays. Only one student accessed the platform on Saturdays. By crossing the date and time of connections with the face-to-face course schedules, it must be observed that a large number of students were connected while attending another face-to-face course, but not an oral communication course, even when to watch a video. The weekly hour subtracted from the face-to-face class time is therefore not perceived as an hour for studying outside classroom hours, but as an hour for studying outside the oral communication course.

By analyzing the resources, we noticed that 30% of students did the 5 quizzes several times, while only 9% retook them 3 times before successfully passing. Eventually,

89% of the panel succeeded in the quizzes. One third of the students completed the non-compulsory workshops. These consisted in filming one-self while performing a presentation in various situations (selling an item, introducing oneself in 1 minute, adapting the voice output to various audiences, or making an investiture speech as the president of one's country), and then posting the video on the platform. If they wished, the participants could assess each others' productions. None assessed these workshops. 73% of students, who successfully completed the MOOC, also attended and assessed them.

The video resources convey knowledge and are the core of the educational training. They are three-fold: The videos by the professor which release what needs to be known and gives real advice on how to apply this knowledge, the so-called "Sophie" videos, in which an actress plays in a comic tone the role of the "bad student" reluctantly performing the tasks proposed by the professor[6], but finally accepting to comply and actually improving her own performance. Lastly film clips illustrating the points covered. The welcoming video was the most frequently watched in the course (71 times), while the film clip « Danton »[7] was the least watched (38 times).

As the videos are hosted outside the MOOC platform, either on YouTube.com for the professor's and Sophie's videos, either on Switch tube for the fiction film clips[8], it is not possible for the moment to investigate the users' behavior concerning these resources (videos watched to the end, half-way through, replayed, etc.) However, the logs show how frequently the students have accessed the videos (zero, one or several times). The total of the 20 "Professor" videos were played 539 times, an average of 49 times per video. Only 1 student out of 48 never watched a resource, nor completed the assignments, so we can deduce that the remaining 47 students watched each video at least once, on average.

The 7 "Sophie" videos were watched 318 times, an average of 45 times, which again corresponds to an average of one viewing per student. The 20 fiction film clips were watched 994 times, an average of 45, which again confirms one viewing per student. The videos called "Golden Rule" summarized the weekly content in one key phrase. These 4 videos were played 177 times, which counts up to an average of 44 viewings, an average close to the number of students involved in this course.

We can observe that the students have accessed the complete course content, as all videos were played. The most "watched" videos in the "Professor" category were "Welcome to this course" (1:34) and "Charism" (7:54). Personal interest and the position of the video inside the course account for the number of viewings, more than the length of the video itself. In the "Sophie" category, the videos "Not convinced" (0:37) and "First attempts" (0:54), situated in the first week, were played more often, while in the fiction film category, the clips "inspiring orators" (7:33) and "motivating discourse" (4:47) were the most often launched. The latter are also situated in the first week. The most viewed "Golden Rule" concerned the one regrouping the golden rule 1 and 2 (0:30). Therefore we observe that the resources provided first in the MOOC are the most viewed. It is highly probable that when the resources in the first part of the course are clear, well-structured and motivating, the course will stand a better chance to be attended till the end, while on the contrary, a MOOC with a "bad" start will present difficulties in retaining its audience as the interest in using the resources diminishes during the MOOC.

B. In the Classroom

In the face-to-face situation, the students proved to be mostly dynamic and involved. It cannot be determined whether using the MOOC can explain this or whether their involvement was connected to a particular class dynamic. Students spontaneously pointed out some imperfections in the MOOC, honestly aiming at its improvement. The exercises completed during class consisted in a two-folded goal: how to face an audience while presenting various exercises aiming at convincing the audience, and how to work on the presentation material. The students were given free time during 3 courses to produce the final group task, which consisted in presenting a computing subject of their choice in pairs. Moreover, a visual support for the presentation was required to be submitted (PowerPoint, Prezi or other) and their presentation screen-played, applying the rules of storytelling covered during the MOOC. Eventually, their whole work was to be presented in front of the class, in an aula of 400 seats, with a suitable dress code, to obtain the second part of the grade of the mid-module assessment. We noticed an overall ease of presentation for all participants, even those who at the beginning showed signs of unease facing an audience. We can thus imagine that this profitable swinging back and forth between the two teaching approaches enabled the students to become more fully involved in the topic. However, only 3 groups actually gave efficient thought to story-tell their presentation. Two groups tried to involve the audience in their presentation by performing a quiz by vote with a show of hands. With seven years hindsight in teaching this topic, we observe that this class was far the best one ever. However, we must refrain from attributing this result to the use of the distributed flipped model. The same experiment will have to be conducted several times over before significant conclusions can be drawn.

C. Students' Point of View on the MOOC

When a MOOC ends, the participants can fill in a course evaluation questionnaire. They are sent by email asking them to fill in a fourteen items questionnaire to help us improving the content of the MOOC. This questionnaire is optional. 15 students answered it, which corresponds to 31%. As this

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[6]This course is a cultural mandatory course. In a cursus dedicated to algorithm, programming and network administration, students consider communication as a pensum.

[7]Danton production (1983) by the director Andrzej Wajda, with Gérard Depardieu, Gaumont productions

[8]Swiss law admits one particular situation called "pedagogical exception". Any material used during a course, to which the participant is granted access by obtaining a specific access, is not submitted to royalties and can be freely used, provided that all sources are mentioned. The on-line course with specified access is understood as a face-to-face course. Concerning video material, and more particularly fiction films, an additional clause is added whereby copies of the films must be owned and hosted by a Swiss provider. Switch tube (https://tube.switch.ch/) provides the Swiss Higher Education Schools with this opportunity.

figure is not statistically significant, we wish our observation to remain careful. Nevertheless, we believe some indications to be of interest, namely the remarks in the open questions.

Only three students had already attended a MOOC before this experiment. 15 estimate that this course meets their needs. One regrets not having more time for fully practicing the advice provided in this MOOC and mentions a different prioritization to account for his lesser effort.

14 believe that the course was suited to their level, 1 claims the opposite. 13 found the course interesting and 2 uninteresting. One person points out that the videos are sometimes long[9], while another person estimates that at the end of this MOOC, the topic is better mastered, against 3 people who believe this is not true. 11 found that the videos were of good quality, 7 rate them uninteresting, 6 useful and of suitable length, while 3 students found them too numerous. One student mentions that some videos are too long, while another appreciates the alternation between the "Professor " and the "Sophie" videos. 14 people watched all the videos, but point out that this task was compulsory. One student wished more "immersive" videos without precisely explaining what he means by this. Concerning the question on the interest in attending a MOOC level 2, mixed answers were collected. We obtained 6 interested, 5 not interested and 4 who don't know.

8 preferred the "fiction film clips", 3 the "Professor" videos, 4 the "Sophie" videos and 4 appreciated all three. 12 students rated the quizzes as suitable, as to their number and difficulty level, but only 5 people thought the number of items were sufficient. 8 people found the peer assessment of the workshop interesting, 4 found it useful (according to one remark, the peer feedback was not meticulous enough), 7 students considered suitable the effort required for completing the MOOC, while only 3 found it easy.

11 would recommend this MOOC to other people, 2 would not recommend this MOOC, and 1 person does not know.

Finally, the most relevant question item concerned the appreciation of this mixed teaching approach, MOOC and face-to-face class.

9/13 answered that the approach was interesting, and 4/13 found it uninteresting without saying why.

IV. FOLLOW UP ON THE EXPERIMENT

The students assess all face-to-face courses. Up to this day, these assessments have not been handed over to the professor. Thus, we cannot know if the face-to-face class part follows the same appreciation curb as the MOOC. Nevertheless we believe that the experiment was successful, namely because all students showed some independence in their working approach. Although alone facing the MOOC, they completed all activities without reminders. Students were only reminded once, one week before the end of the module, that the MOOC had to be completed. The fact that the MOOC is graded and directly affects the successful completion of the communication module obviously accounts for part of the students' involvement. We feared that having to face the

same professor during classroom sessions and also in the MOOC videos would be perceived as unnecessary or boring, but no student mentioned such a thing, neither orally nor in the evaluation.

To conclude, we estimate that the success of such a device relies on several factors. Firstly, the support by the faculty is essential. A professor's individual initiative without link to a more global concept will be considered by the participants as a professor fancy, rather than an experiment favorable to achieve success in a course. Secondly, the MOOC must be lighter in tone and activity volume, compared to the face-to-face course.

One reason for the high dropout of MOOCs (>90%) is due to the work overload required by participants in a short time span. In this way, "diluting" this MOOC on oral communication over 16 weeks probably explains the high attendance rate of 98%. Finally, although the quality of the design and the overall coherence of the activities, in the MOOC and in the face-to-face class, indeed form a crucial factor, the fact that a grade is granted for succeeding in this module provides the MOOC with a value, drives the students to attend it right to the end and to become involved.

For the moment, the HES-SO has not decided to massively invest in the production of MOOCs. The production of one to two MOOCs per year is planned.

This cautious policy means that the model "distributed flipped MOOC", even if the results observed in this pilot are encouraging, will not be widely distributed within the institution.

Other surveys must be conducted, in order to assess the interest in embedding MOOCs from other establishments into the face-to-face curriculum and to measure whether this solution can bring an efficient and viable orientation.

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[9]The longest video lasts 13 :45 and is thus designed as a TV program with video clips, embedded text etc.

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