Development of a blended learning initiative using MOOCs

María Fernanda Rodríguez, Josefina Hernández, Jorge Maldonado, Mar Pérez-Sanagustín

School of Engineering, Pontificia Universidad Católica de Chile
Av. Vicuña Mackenna, 4860, Macul, Santiago (RM), Chile
`{mfrodri3, jmherna1, jjmaldonado, mar.perez}@uc.cl`

Abstract. This article reflects upon two case studies of two blended learning initiatives conducted at the Pontificia Universidad Católica of Chile (PUC). These two cases show how to integrate MOOCs as a remedial complement and as a flipped classroom, focusing on the lessons learned about their design and student's adoption.

Keywords: Blended learning, MOOC, Teaching

1 Introduction

UC Online[1] is an initiative of the School of Engineering (PUC) that has promoted the quality and pedagogical innovation through MOOCs since 2014. This initiative aims at supporting the design and production of MOOCs, involving different actors of the School of Engineering. From the beginning, this initiative aimed at going beyond offering online educational materials and, in the last two years, new educational models that derived from MOOCs were proposed [1]. As a result, the PUC began to explore how to incorporate MOOCs as part of the formal curriculum through a variety of Blended Learning (BL) initiatives. This initiative was based on the positive effects on students' satisfaction and development of cognitive, attitudinal and procedural skills found in prior work [2]. This paper presents two case studies of BL that reuse MOOCs focusing on the design changes conducted by the teacher.

1.1 Case study 1 (CS-1): MOOC as a remedial complement

The School of Engineering accepts over 700 freshmen students every year, whose knowledges about math are diverse. However, more than 30% of them fail math courses (Calculus I and Algebra) in the first semester. In order to overcome this problem, since 2014 freshmen must take a calculus diagnostic exam that is distributed in four modules. As a complementary support to study for this exam, the PUC produced one MOOC for each module. Finally, those students who fail the contents' exam may take a 2-day intensive face to face course, voluntarily [3].

---

[1] http://online.ing.puc.cl/

1.2   Case study 2 (CS-2): MOOC as a flipped classroom

In the last two years, teachers of the undergraduate course on Organizational Behavior with 350 students used different strategies into promote learners' participation, but didn't succeed. To address this problem, during the second semester of 2016 they implemented a flipped class using a MOOC in Coursera. The "flipped" design considered three moments: Before class, students had to read texts and watch video-lectures from the MOOC. During class, students developed collaborative work, solved problems and debated. After class, students evaluated the work done by their peers [4].

2   Lessons learned

CS-1: Regarding adoption, we learned that (1) Students were not prepared to adopt MOOCs as a complement for self-study; (2) The students that were more active in the platform showed a higher probability of passing the exams; (3) Students used the MOOC for reviewing the contents that they didn't learn in high school; (4) Students showed more activity in the MOOC the days before the exam. Finally, regarding design we learned that (5) Students' appreciate the MOOC when its design is rich in activities.

CS-2: Regarding adoption, in this case study we learned that (1) Students that were more active in the MOOC obtained better grades than their counterparts; (2) Students come more prepared to class when they have to work collaboratively in randomly formed groups; (3) Students' participation should be promoted since the first day, with interactive Q&A systems such as clickers. Finally, regarding the design we learned these lessons: (1) A flipped classroom design using MOOCs foster motivation and participation of students; (3) Teachers need to have enough time to design their flipped courses, because they are more time-consuming than traditional courses; and (6) Teachers need to be open to adapt the course continuously according to students' performance in the course's evaluations [4].

3   References

[1] Pérez-Sanagustín, M., Hilliger, I., Alario-Hoyos, C., Kloos, C. D., & Rayyan, S. (2017). H-MOOC framework: reusing MOOCs for hybrid education. Journal of Computing in Higher Education, 29(1), 47-64.

[2] Bekele, T. A. (2010). Motivation and Satisfaction in Internet-Supported Learning Environments: A Review. Educational Technology & Society, 13 (2), 116–127.

[3] Pérez-Sanagustín, M., Hernández-Correa, J., Gelmi, C., Hilliger, I., & Rodriguez, M. F. (2016, September). Does taking a MOOC as a complement for remedial courses have an effect on my learning outcomes? A pilot study on calculus. In European Conference on Technology Enhanced Learning (pp. 221-233). Springer, Cham.

[4] Rodríguez, M. F., Correa, J. H., Pérez-Sanagustín, M., Pertuze, J. A., & Alario-Hoyos, C. (2017, May). A MOOC-Based Flipped Class: Lessons Learned from the Orchestration Perspective. In European Conference on Massive Open Online Courses (pp. 102-112). Springer, Cham.