Facing the COVID-19 Pandemic with Moodle, Collaborate, Smowl, Meet

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1 Introduction

The COVID-19 pandemic has imposed a deep reorganization of lectures and exams within universities in order not to stop students careers during the second semester of the current academic year. In Italy the lockdown period was decreed on March 8, when the second semester had commenced a few weeks before, thus forcing a massive conversion of face-to-face lectures into on-line ones. According to data collected by MUR, the Italian Ministry for University and Research, and Fondazione CRUI, the Conference of the Rectors of the Italian Universities, the reaction of Italian universities was extremely effective, as within one month from the beginning of the lockdown more than 90% of the undergraduate courses ("corsi di laurea") had been moved on-line.

In mid May several restrictions about interpersonal distance as well as traveling were still active, so that also exams and thesis defenses had to be supported by digital technologies. This opened a passionate debate on how exams, especially written ones, had to take place on-line. Actually, the discussion about massive distance learning had already started in March, with an increasing number of webinars organized by both Fondazione CRUI and CODAU, the Conference of the General Directors of the Italian Universities, in which a few universities presented their experiences and several vendors illustrated their products. Those webinars were important occasions for all the Italian universities, which participated through their delegates to digital transformation or innovative teaching as well as their technical staff, to share information about digital technologies and teaching methodologies, and hence improve their reaction to the pandemic.

The purpose of this extended abstract is to report on the experience of the University of Urbino in facing the COVID-19 outbreak via massive distance learning and on-line exams. We start with some figures about our university and the organization of our teaching and learning center, as this is instrumental to understand how we are dealing with the pandemic (Sect. 2). We then discuss the combined use of a number of software tools, which are the learning management system Moodle (`https://moodle.org/`), the integrated webconference tool Blackboard Collaborate (`https://www.blackboard.com/`), the e-proctoring tool Smowl (`https://smowl.net/`), and the standalone webconference tool Google Meet (`https://meet.google.com/`), to provide support for online lectures (Sect. 3) and oral and written exams (Sect. 4). We finally conclude with some considerations about lessons learnt and future challenges (Sect. 5).

2 Teaching and Learning Center

The University of Urbino, established in 1506, features in the current academic year 34 undergraduate programmes, divided into 15 "laurea triennale" programmes, 5 "laurea magistrale a ciclo unico" programmes, and 14 "laurea magistrale biennale" programmes, for a total of almost 1,000 courses, plus 4 PhD programmes. The overall number of undergraduate and graduate students slightly exceeds 14,000. The teaching staff is composed of more than 300 professors and researchers and more than 300 external lecturers, plus 40 foreign language experts. All these people can access in single sign-on our Moodle platforms.

Although since the academic year 2004/2005 a very limited number of undergraduate programmes had been offering on-line activities, only in 2015 a teaching and learning center was created at the University of Urbino. CISDEL – *Centro Integrato Servizi Didattici ed E-Learning* coordinates a number of activities for all the undergraduate and graduate programmes, both face-to-face and on-line. As far as the latter are concerned, CISDEL maintains three Moodle platforms:

- *Moodle blended* `https://blended.uniurb.it/moodle/` is structured by automatically importing from U-Gov Didattica the whole undergraduate offer and provides a virtual room for each course of any of the 34 undergraduate programmes of the current academic year as well as foreign language activities. Every room is automatically equipped with a link to the web page of the course and a forum for the lecturer and the students. In each the last 5 academic years, more than 80% of the aforementioned rooms have been used for discussions on the forum, sharing teaching material in the form of lecture notes, slides, and multimedia resources, or organizing activities in which the students can assess their preparation before taking the exam.
- *Moodle elearning* `https://elearning.uniurb.it/moodle/` is structured in the same way as the previous platform, but is devoted to the 6 undergraduate programmes that in the current academic year offer part of their lectures on-line. Distance learning takes place via Blackboard Collaborate, a webconference tool integrated in Moodle through a suitable plug-in, which allows lecturers to plan their lectures directly inside Moodle and students to find the recordings again inside Moodle. In addition to features available in most webconferencing tools like a textual chat, document presentation, and screen sharing, Blackboard Collaborate provides a button for raising a hand, a shared whiteboard, a polling capability, and dynamic role management, all of which are quite effective in a teaching context.
- *Moodle education* `https://education.uniurb.it/moodle/` hosts virtual rooms for all the other teaching activities like CISDEL seminars, contamination labs, and PhD programmes, even including courses on safety in work places and personal data protection, whose targets are all employees, collaborators, and students of the University of Urbino.

In addition to that, CISDEL maintains `https://www.uniurb.it/blended` which is a web page with plenty of short textual notes and videotutorials about how to configure and use Moodle resources and activities.

3 Massive Distance Learning

The province of Pesaro-Urbino, in Marche region, was one of the most affected by the COVID-19 pandemic in the central part of Italy, so that all local schools and the University of Urbino had to stop their on-site teaching activities already on March 2, i.e., one week in advance with respect to the national lockdown. On February 28, two Rector's notes respectively informed lecturers and students that all face-to-face lectures would have been replaced by on-line ones from March 2, taking place on the Moodle blended platform via the integrated webconference tool Blackboard Collaborate, by following the same timetable as face-to-face activities and recording the lectures themselves for students not able to connect.

This immediate switchover was made possible by two factors. The former was the availability of a learning management system for all the undergraduate programmes – Moodle blended – with which the vast majority of lecturers and students were familiar since the end of 2015. The latter was the presence of a teaching and learning center – CISDEL – that periodically trains users and assists them when they encounter problems in Moodle.

Of course, the aforementioned switchover had to be accompanied by a number of additional measures. First and foremost, CISDEL assistance, mostly taking place via e-mail, was enhanced by introducing a phone help desk responding Monday to Friday from 9 am to 6 pm. Secondly, the blended learning web page was enriched by CISDEL with additional information and videotutorials, in particular a new section devoted to distance learning was added because only a few lecturers and students – those of 6 undergraduate programmes out of 34 – were accustomed to use Blackboard Collaborate. Finally, a higher number of computational resources had to be reserved in our server farm to the Moodle blended platform so to satisfy the increased workload, with the architecture of the platform itself being entirely revisited for achieving better performance.

In the period going from the beginning of March to the beginning of May, we observed every workday around 10,000 users accessing our Moodle blended platform, with peaks of 3,000 users in the same hour, especially in the morning. By the end of March, more than 90% of our almost 1,000 courses within the 34 undergraduate programmes were delivered on-line. A positive side effect was that all the 4 PhD programmes finally started using Moodle systematically, with on-line lectures taking place with Blackboard Collaborate.

It is worth mentioning that also the undergraduate thesis defenses scheduled on March and the PhD thesis defenses scheduled shortly thereafter were moved on-line. They took place via Blackboard Collaborate and were broadcast via the `https://www.uniurb.it/live` channel so to allow parents, relatives, and friends of graduating students to participate in the event.

4 Oral and Written Exams

Two Rector's decrees dating back to April 14 and May 14 established the protocols to be followed for on-line oral and written exams, respectively. Like in the

case of distance lectures, oral exams take place within the course room in the Moodle blended platform via Blackboard Collaborate. Obviously, before starting each exam, the lecturer has to make sure of the student's identity and, via the student's webcam, verifies that no other person is in the student's room and no teaching material is near the student's computer.

The organization of written exams is more complex given the simultaneous presence of several students taking them. Many lecturers thus decided to convert their written exams into oral ones during the emergency period. However, there are disciplines in our university like Sciences, Economics, and Foreign Languages in which this is not always appropriate. As a consequence, we equipped our Moodle blended platform with the plug-in of the GDPR-compliant e-proctoring tool Smowl, which was offered at a discounted price during the pandemic. Smowl performs facial recognition and, through the Smowl CM component installed on each student's computer, take screenshots of all open applications.

Every on-line written exam takes place within the course room in the Moodle blended platform via a quiz or assignment activity. Smowl is used for frontal visual monitoring, so to make sure that the student does not leave its place and no other person gets close to the student, and computer monitoring. Blackboard Collaborate is used for audio monitoring, which also enables students to pose questions about the exam and the lecturer to provide explanations. It is additionally recommended to use Google Meet via students' smartphones for environmental monitoring, which is helpful to face possible connection losses in Blackboard Collaborate and necessary in case of paper-and-pencil exams.

Currently, more than 100 courses are using the setting described above, with more than 3,000 students involved in on-line written exams.

5 Conclusions

Our experience emphasizes the importance of the presence of a teaching and learning center as well as of a learning management system already in place for all the major teaching activities. In case of health, weather, hydrogeological, and seismic emergencies, they both contribute to reduce enormously the switchover effort and consequently increase the institution resilience.

As for written exams, to set up an effective anti-cheating system we firmly believe that the solution is the combined use of several tools. In other words, using only e-proctoring tools like Smowl, or only video-surveillance-like tools based on grid views or carousels, is not satisfactory.

The challenge during the second half of the current academic year has been the quick provision of suitable technological support to keep giving lectures and organizing exams. The challenge in the first half of the next academic year, i.e., having part of the students in physical rooms and the remaining ones attending on-line, will necessarily require to pay more attention to methodological issues as well as to equip rooms with suitable multimedia technology like touch boards and smart webcams.