Abstract

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Double Blended Learning
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ABSTRACT
In order to exchange courses with other European universities, we have experimented double blended learning for our master courses (MALTT) in TECFA. It consists of full distance learning combined with blended learning (a course involved of learning both at presence and in distance). After the course, interviews of both the students and the teaching staff were conducted and analysed, which helps to extract the key issues in the design of this course. These issues include the community building, the monitoring of distance students’ activities during the course and the task repartition between the teacher and the teaching assistant.

THE DOUBLE BLENDED LEARNING CONTEXT
TECFA is a teaching and research unit in the University of Geneva specialized in Educational Technologies, whose members teach, use Educational Technologies and do researches on them as well. TECFA has been using the following pedagogy for this blended learning [1] course for several years: each semester is composed of three learning periods, and each learning period lasts for 5-6 weeks: the first week would be a face-to-face intensive course; while the rest of the time (4-5 weeks) for distance individual or collaborative activities, which would be realised in a collaborative learning platform (document sharing, wiki, forum are main tools in this platform).

During the past years, thanks to the Bologna Process - the European effort to harmonize higher education, a big change took place. Courses and credits are now standardized at the European level, which makes it possible for students to acquire credits from different universities in different countries. Universities are also encouraged to open their courses to other European students so that they could follow courses at distance with the help of e-learning technologies.

However, this political wish is hard to put into practice. Indeed, it would be easy to put course notes and teaching material online and declare this as e-learning. However, this would make an inefficient pedagogy and our goal is to go beyond that.

The “Swiss Virtual Campus”, a program dedicated to the promotion of learning over the internet at the Swiss Institutions of Higher Education, funded an innovative project at TECFA for exchanging courses with the University of Besançon in France, where full distance education was provided. The challenge was to share several Master courses with full distance students from the French university, and at the same time to maintain the blended learning already existing in TECFA.

Several alternatives were possible. From a pure pedagogical perspective, it appeared that the ideal situation would be to design two separate scenarios for each population, in order to meet the particular needs of each. However, it was not acceptable from an economical point of view even if it would have been possible to adopt this approach in a pilot experiment. What’s more, sharing a course should not overload the teachers if the long term goal is to expand such practice to large classes.

So it has been decided that the face-to-face course for students in Geneva would be synchronously followed by Besançon students, while the distance activities would be performed identically by both. This setting was defined as Double Blended Learning, since it blended another modality with an existing blended setting.

We defined the students who follow the classical blended setting the local students; while the students who follow the courses completely at distance the remote students.

In this article the pilot experiment for one of the course will be reported, whose topic is to design educational/training software. This course was composed of two parts: leaning the fundamental concepts of the domain, and practising the implementation of software. This course was conducted in three periods of five weeks: one face-to-face week of three one-and-half-hour sessions and four distance weeks.

The students’ backgrounds were Computing, Psychology or Educational Sciences, with a predominance of the two latter fields.

There were 13 local students and 5 remote students (living in France or abroad, who did not know each other and had no chance to meet). A teacher and a teaching assistant gave the course in the classroom, and a technical assistant, hired only for this pilot experiment, was also present ready to solve technical issues. The qualitative result regarding this innovative setting will be reported in this article.
THE PEDAOGICAL SCENARIO DESIGN

General requirements

Designing a pedagogical scenario for this double blended setting was not an easy job. We took the risk of either favouring one population over the other, or worse, favouring neither of them. Thus the constraints were as follows:
• The quality of the face-to-face courses should not be diminished because of the five remote students.
• The activity of the remote students should not be limited to passively following the activities of the class with the local students, the teacher and the teaching assistant.

Activities during face to face courses

The remote students had the possibility to listen to the teacher, watch the teacher’s screen, listen to the local students, chat, talk, and interact in the e-learning platform of the course (see below for the technical details of the setting). They could also be seen by the class and other remote students. They were thus encouraged to behave like local students, even if it is evident that their position was not equivalent to local students due to the technological barrier.

One of the main design constraints brought by double blended learning was the length of the expository parts of the courses. It seemed unreasonable to expose remote students with one-and-half-hour talks from the teacher. Thus the lectures were limited to maximum 30 minutes periods. Between these short lectures, students were asked to do activities.

Here we have an example of a direct influence of the double blended situation on the classical blended situation. However, teaching staff has clearly identified that it would not be detrimental to the course, because it would promote a more active participation of the students, which had been proved valuable in the context of active pedagogy promoted at TECFA.

The students’ activities were as follows:
• Individual or small group reflection on a focused question;
• Pooling of the students ideas and work in order to promote discussion among students;
• Presentation of one student to the rest of the class of his/her work;
• Question and answer sessions, regarding the global organisation of the course.

Distance activities

The initial idea was that there would be no distinction among the students during the distance weeks. Thus for the distance activities, we did not adapt the pedagogy to the double blended learning setting. Groups of two or three students were organized to do activities together, mostly writing activities in wikis.

Our idea was to build mixed groups with both local and remote students. However, for practical reasons (students constituted their groups themselves) some groups containing only remote students were finally build.

The e-learning platform contains a global discussion forum, in which every student post (copies of the message are e-mailed to the students). We quickly found that remote students had specific requests and discussions irrelevant to local students. So another forum was created, specific to the remote students, in order to regulate their learning activities.

Remote and asynchronous students

Contrary to what had been initially expected, some remote students could not synchronously attend certain courses. The easy solution to that problem was to record the sessions and make them accessible via the learning platform, so that asynchronous remote learners could re-catch the missed sessions. However, it would be very tedious to view all the recorded courses without guidance concerning the activities to perform.

Finally we decided to build for these students a specific scenario covering the week preceding the four distance weeks, in order to “resynchronize” them with the rest of the class. This scenario was based on the face-to-face scenario, with the following adaptations:
• The scenario included specific written instructions for the asynchronous remote students.
• Only individual reflection activities in the original scenario were maintained.
• Courses were not only audio-video recorded but also time tagged so that the instructions could refer to precise parts in the recording. For example, the instructions would mention “listen to the teacher instruction (minute 32 to minute 39)”.

It should be noticed that the recording was also useful for synchronous remote students in case they would have missed something in the course.

In one case, the whole group was unavailable during a presentation activity; one asynchronous remote student was given the possibility to record his presentation in advance. This recording was then projected to the other students during the face-to-face session.
Technical setting

Two kinds of collaborative software were used for this double blended learning: Moodle for the asynchronous collaborative activities and Macromedia Breeze for the synchronous communication. Macromedia Breeze includes bidirectional audio and video communication, screen or application sharing, chat, audiovisual recording (plus other functionalities rarely used in this setting). Note that the number of participants is limited to 10. Moodle contained all instructions and resources for the course for both the face-to-face and distances periods, together with wikis, forums and chat.

Only the teacher, the assistant and the remote students used Breeze. The teacher’s screen was overhead-projected, so local students could often watch the remote students through Breeze screen. The classroom was equipped with a system of 8 microphones to capture the sound of the local students (see Figure 1). To intervene, students had to push a button on the microphone’s base.

Each student in the room had a computer for their individual work, connected to the Moodle platform in particular. The assistant also had a computer, connected to Breeze.

RESULTS

Method

Several data have been collected in order to evaluate this innovative setting:

- The trace of the activities, both on Breeze and Moodle;
- Interviews of the teacher and the assistants (two different teaching assistants successively intervened in the course);
- Interviews of 3 remote students;
- Interviews of 4 local students.

These data were used for a qualitative analysis of the course, offering a multi-angle view on the course.

General results

The first finding is that the technology adopted was not running smoothly during the course. There was a preparation time of half an hour, during which sound and visual connection was tested carefully with the remote students. This can be explained by the fact that remote students were at home, in their office, even once in a cybercafé, where connection was not optimal.

Even when the connection was properly established, the sound transmission was problematic. First, frequent short interruptions were observed, which
impeded remote students’ understanding. Second, the microphones did not properly capture the voice of the local students during the discussion. We improved the situation during the semester, but not all technical problems were solved at the end.

Despite these basic technical problems, the experience was positively experienced by all participants. Local students did not consider that the remote students were detrimental to the course. Remote students appreciated the experience and they were motivated to come back and tried to improve the technical situation. All 5 students finished the modules, though the degree of engagement varied among students.

During the face-to-face sessions, the communication occurred between the teaching staff and the remote students, but seldom happened directly between the local students and the remote students. Technical sound problems might explain this configuration.

Managing the face-to-face session in the double blending mode

Despite our effort of designing the face-to-face sessions, some specificities of the configuration were discovered during the course. After interacting with both local and remote students, the teacher quickly found it very difficult to focus on both populations at the same time. A typical situation was as follows: the teacher was giving a short lecture, putting all his effort in explaining a notion, while a message appeared on the screen as a pop-up, saying “I do not hear very well”. The teacher's attention was distracted by the message; he then had to read it and stopped his discourse to solve the technical problem addressed by the remote student.

Quickly, the situation turned out to be like that: The teacher focused on the local students, almost forgetting the remote students during the lectures, while the teaching assistant interacted with the remote students with the chatting module.

The organization of the course would then become manageable. In the above example, the teacher could deliberately ignore the remote students’ message, knowing that they were taken in charge by the assistant. The teacher commented on it later on as: “I concentrated on the lectures, while the assistant concentrated on the remote students. [...] It is a matter of attention; you cannot divide your attention into two things”.

The assistant had to follow the course, and at the same time to manage the communication with the remote students. Furthermore, taking notes of the various intervention from the students and the teacher was also a time-consuming task. “So I was rather busy recording the conversations. And then, every 30 seconds, I should see if something happened, I answered quickly and then I came back”.

This task sharing was accepted by both the teacher and the teaching assistant. However, a slight confusion was observed about the use of the screen. There were two computers, one was projected to the class, and the other was shared by the remote students. Sometimes the projected screen was the same as the shared one, but sometimes not. Sometimes the teacher's screen was projected; sometimes the assistant's screen was projected. The change of the screen setting to meet various needs occurred during the course. As a result, neither the teacher nor the teaching assistant knew clearly which computer should be used for which usage, especially during the communication with the remote students.

Managing the synchronous individual activities of remote students

After launching an activity, the teacher would typically circulate within the local students in order to give support. A conversation about the activity and a discussion based on the notes written by the students would occur between the teacher and the students. It was possible that local students could listen to the others’ comments.

The interaction processes like these are obvious in the classroom but quite difficult to reproduce in distance. It happened that remote students did not benefit from the teacher's monitoring during activities. The monitoring was limited to questioning by the remote students, either via chat (answered by the teaching assistant) or voice (answered by the teaching assistant or the teacher). The voice communication was not used very often for the questioning for that the remote students might disturb the whole class for their questions.

During the pooling activities, the remote students could participate in the discussion, without any specific problem. The teacher could then check that the activity was performed, but had much less control of the activity during its fulfilment.

Community building

Although the pedagogical design aimed at putting the remote and local students at the same level, it was observed that remote learners felt that they were not really integrated in the whole class. A remote student reported as that: “I felt that I belonged to the group of distance students. There are people in presence that I totally ignore. I don't know them.”

Remote students developed a strong feeling of belonging to the same group, following a general pattern internet-based communication [2]. The need for a specific forum for the remote students (see above) is a clear sign of this feeling, even if at the same time it increased the group sense of community.

It should be noticed that this feeling of not being part of the class was confusing for the teaching team, because it did not reflect the real setting. For example, during the distance weeks, local students were not
together anymore, some of them lived far from Geneva, however, the remote students would still consider themselves as a different group.

There was an interesting finding that when interviewed, local students did not feel that the remote students were not integrated. For example, one student reported: “regarding work, I did not see differences. Let's say that I do not visualize two different groups, the ones who are in Geneva and the distant ones”.

When the remote students intervened during the course via audio, the local students paid particular attention to them, which led to a reinforcement of the feeling of being part of the group, from the local students point of view. One local student reported: “I found them rather present. Maybe it was because they intervened regularly. We have a kind of presence. One has almost an overpresence”.

**DISCUSSION AND FUTURE WORK**

This pilot experiment showed that it is possible for remote students to follow a course based on blended learning, without adding excessive work for the teacher. This result is quite encouraging but additional results and improvements are needed, in order to extend this pilot course to a larger context.

The technical difficulties regarding the sound transmission are of course the first problem that has to be solved. It can be conjectured that the remote students’ ability to follow the distance course despite the technical problems is partly determined by their motivation to discover new ways of learning, because educational technologies are also their field of learning. We believe that these problems must be solved in order to use double blended learning for a wider population of learners.

One of the main results from this pilot study is the specific learner community pattern experienced by the local and remote students. It suggests several research directions. First, a more quantitative analysis of the pilot experience is needed, to confirm the hypothesis that remote learners felt belonging to their own group and not to the whole group, while local students felt that remote students were in the same group. Second, it is necessary to explore this hypothesis further, in a new setting. The reason of this separation in two groups can be found in several practical issues that have to be tackled, before being able to generalize:

- Technical difficulties isolated the remote students while fostering the building of their community, through a solidarity effect.
- The absence of the monitoring for the remote students’ activity during the class contributed to make them feel apart from the group.
- The fact that during the class the local students did not communicate directly with the remote students also contributed to the separation.

• Thus, in order to improve both the efficiency of the course and the sense of belonging to the whole class, we plan to implement a new double blended learning course with the following changes:
  - Solve all basic technical problems (sound in particular).
  - Explore ways to synchronously monitor students at distance, with technologies enabling the remote students to share the product of their activity: whiteboards, screen sharing, etc.
  - Improve the presence of the remote students in the classroom, by projecting their webcam in an additional screen. The classroom will have two screens with overhead projection, one for the remote students’ webcams, the other for the activities.
  - Improve the process of remote students’ taking turn, something that was not clearly formalized in the initial setting.
  - Promote more systematically group activities between local and remote students, rather than among remote students. Indeed, small group activities tend to foster the sense of community [3].

With these new conditions, we make the hypothesis that remote student will feel that they belong to the whole class more than the group of remote students [3,4].

Another area of investigation is the distribution of roles during the class between the teacher and the teaching assistant. Even if we strongly believe that it was the best solution in the current context, there still exists a question: whether this organisation is specific to this pilot experiment or it should be extended to all double blended courses (or to any course that include both remote and local students).

We make the hypothesis that current and accessible technologies do not make it possible to align remote communication with local communication. In other words, it is not possible in the short term for a teacher to perceive and act on remote students in the same way and at the same time when he is perceiving and acting on the local students. Even if technological research is performed in that direction, our goal is to experiment double blended learning with available technologies. Thus, one of the main activities in the scenario design should be to formalize the respective roles of the teacher and the teaching assistant, and their use of the hardware available in the room: two computers, two screens, one or two webcams, microphones.

**CONCLUSION**

We have experimented an innovative setting, where a master level course was given in parallel to a blended learning class and full distance students. We have tried to avoid duplicating the pedagogical scenarios and to incorporate the remote students with the rest of the population.
Despite various practical difficulties, the course has been successfully carried out, and both local and remote students were satisfied with the experiment. Interviews were conducted with the teacher, the teaching assistants and the remote and local students. Several interesting features could be extracted from these interviews, which may help us to identify the key issues in this double learning setting:

- Community building of the class;
- Teaching resource management in the synchronous communication;
- Synchronous monitoring of remote students.

A new similar course is planned and will tackle these problems during the design.

From a technological point of view, no software can fully meet our objectives. Indeed, existing communication tools are either broadcasting tools, dedicated to communicate a lecture to distance attendees, or collaborative working tools, dedicated to the communication within a scattered team of people. Double blended learning can fulfil these two needs. Furthermore, we used one environment for asynchronous learning, and another for synchronous communication. It would be valuable to find a way to integrate these two environments, in order to avoid constantly switching between them. This experiment thus shows that new needs emerge in the domain of higher educational which are not easily fulfilled with current educational technology.

**REFERENCE**


