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The lesson learned:
What we have learned
from the pandemic
and how to innovate
schools and universities
in order to overcome it

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Teaching and learning during the Covid-19 pandemic: University students' perspective on phase 3

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Abstract

Whereas there is a growing body of research focusing on the university educational activities during the first phase of the Covid-19 pandemic that started abruptly in the spring 2020, the next phase (August-December 2020) is still quite under-studied. Throughout this phase, Sapienza, as many other Italian universities, implemented a teaching approach by combining in-person and remote attendance for many of the lessons. As a result of this arrangement, a quote of students (with the professor) was physically in the classroom, whereas the other students were connected in streaming. The present work explores the students' perspective on benefits and problems of such a new technological choreography and educational arrangement. Their suggestions may contribute to plan new post-pandemic blended scenarios.

Keywords: Distance Learning; Covid-19; Phase 3 Mixed Modality; Educational Activities; Students' Perspective

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Introduction

When a total lockdown was enforced in Italy on the 9th of March 2020, all university activities (and the lessons of the second semester in particular) were brutally interrupted. This unexpected event requested a quick reorganization of all educational activities (Dominici, 2020). There was no time for a shared and concerted technological design or educational planning. The solutions adopted by university professors, also on the basis of their different previous abilities and competence on the management of online courses and lessons, were highly differentiated: they went from the online delivery of “talking” power points, to the lessons in streaming on platforms such as Zoom or Meet, to web-based accessible repositories of materials and slides. The most common solution however was an improvised combination and bricolage of such various methodologies and technologies.

In a research conducted during this first period of the Covid-19 pandemic Ligorio, Cacciamani and Cesareni (2020) showed that for almost 80% of university students, this was the first occasion in which they participated in technologically-mediated distance learning classes. On the other hand, while about 50% of professors had used forms of online teaching in the past only 32% of them had had specific training in the use of educational technology.

A research promoted by the Council of students and student associations (UNIBO, 2020), in collaboration with the University of Bologna and the Urban Innovation Foundation and involving 16.386 students (about the 20% of the students enrolled), shows that, in the face of a very high frequency (90%) of online classes during the lockdown period, the degree of satisfaction expressed by students was only quite positive ($X: 3.3$ on a scale 1-5). Participating students complained about the lack of interaction with peers, the lack of a stable internet connection, and the lack of suitable and protected spaces at home from which to follow classes. Looking forward, the majority of students who participated in the survey felt that in the post-pandemic future, the best solution might be to provide for blended forms of in-person and online teaching.

Similar results emerge from a survey promoted, again during the lockdown period, by the University of Modena and Reggio Emilia involving about 5.500 students (equal to 20% of the total enrolled students). The students express average satisfaction with distance learning, although they complain about the lack of social interaction connected to university life and the difficulties linked to the availability of adequate electronic devices and of a stable connection (13% do not have one) in order to follow lectures, download materials and take exams from a distance. Students also express a sense of fatigue and concentration difficulties related to online attendance, as well as a general sense of bewilderment and dissatisfaction with the overall situation related to the restrictions due to the pandemic. In a survey carried out at the University of Siena (Distaso et al., 2020) in which 1.609 students (12% of those enrolled) participated, it emerged that only 51.3% of them positively evaluated the distance teaching carried out during the lockdown period. There are, however, considerable differences between students enrolled in different faculties. The least positive evaluations are expressed by students enrolled in Biomedical Sciences and Medicine, courses in which there are numerous internship and laboratory activities. Such a kind of educational activities can be carried out with great difficulty in online mode and in many cases have therefore been suspended in the sudden emergency. It emerges that the majority of participating students (45.8%) would like distance learning to support frontal teaching in the future, while 42.3% of students would like to return to traditional teaching.

In this context, the results of a study conducted on 76 students of the degree course in Medicine and Surgery at Sapienza University of Rome (Relucenti et al., in press), who attended anatomy courses in traditional mode in the first semester and in online mode in the second semester during the lockdown period, are also interesting. A percentage of 51% of students say they prefer to attend face-to-face classes, whereas a slightly lower percentage (41%) say they prefer online classes. With respect to the overall evaluation of the online attendance, students particularly appreciated the easy access to a richer and wider amount of learning materials, being able to organize their time to attend lectures and study, and not wasting time to physically

reach the university. In addition, as an external measure of the effectiveness of online teaching, the authors describe how the marks of the exams taken at the end of the distance learning course had a statistically significant higher average value compared to the marks obtained in the exams at the end of the course in presence.

The picture that emerges from the students on the first period of the pandemic phase (Table 1) is therefore rich and composite, with some positive aspects but also problematic and difficult ones.

Table 1. Critical and positive aspects of on-line attendance in the first period of the Covid-19 pandemic

	Positive aspects	Critical aspects
1	Easy access to a richer and wider amount of learning materials	Lack of interaction with peers
2	Being able to organize time to attend lectures and study	Lack of a stable internet connection
3	Not wasting time to physically reach the university	Sense of fatigue and concentration difficulties
4		Difficulties (or suspension) of internship and laboratory activities

These results make it further interesting to investigate the perceptions of students in a phase following the first emergency ones. In order to address this phase, which began in August 2020, universities have had time and the opportunity to plan educational activities in a less sudden and impromptu manner than during the initial lockdown period. In addition, students have also attended classes counting on a greater familiarity with technologically mediated forms of teaching and learning

Phase 3: A mixed educational scenario for university

Following the prescription of the Italian government (DPCM of June 11, 2020) from June 15, 2020, began the so-called phase 3 of pandem-

ic management. About universities, following the general indications of the government, on July 30, 2020, the Minister anticipated to the Chancellors of Italian Universities the indications for the resumption of lessons for the fall of 2020. These indications were then included in attachment 18 of the DPCM of August 7, 2020. The indication has been to provide a plan to offer educational activities and lesson able to be delivered both in presence and at a distance, with synchronous and /or asynchronous mode: “Where possible, the teaching will be delivered simultaneously both in presence and online, outlining a mixed teaching that can be delivered in university classrooms but at the same time also at a distance” (DPCM of August 7, 2020). The DPCM was in fact suggesting a “spurious” blended approach attempting to get presence and distance to coexist by reproducing live streaming the in-presence lessons.

In the DPCM, it is suggested that rotation pre-booking systems be provided for student access to classrooms precisely to “safeguard the safety distance imposed by health regulations”. It is also planned to finance a plan for the enhancement of the digital infrastructure of the universities (such as equipment of classrooms, and network connectivity), as well as indications for organizational measures of prevention and protection for the exercise of teaching activities in presence. Universities are requested to provide communication and information activities about these organizational and educational arrangements for faculty and students. All Italian universities have therefore had to design phase 3 educational activities within the perimeter of the government guidelines.

However, the choices regarding the organization of educational activities for students were varied, exploiting the degrees of freedom contained in the government guidelines. Some universities (among the large universities, the University of Bologna, for example), differentiated between curricular activities (in mixed mode) and laboratory activities. The latter were held always in the classroom with small groups of students, taking advantage of a specific rule of the DPCM August 7, 2020: “Universities may organize themselves in order to guarantee the presence of all laboratory activities, exercises and experiential activities, an integral and indispensable part of

quality training, in full compliance with safety regulations”. Other universities (among the smaller ones, the University of Pisa) while not preventing students from attending in person have promoted and supported curricular activities at a distance. The majority of universities, including, Sapienza, the university where the research we are reporting on was carried out, have instead provided for a mixed method of organizing all educational activities, without distinguishing between lectures and laboratories, (neither on the basis of course years or the number of students attending). All lessons scheduled for Fall Semester were delivered in a mixed mode: the professor was physically in the classroom, along with a limited and controlled number of students, while simultaneously streaming onto a sharing platform (Meet or Zoom) that other students accessed at the scheduled class time through a previously shared link.

The present work aims to explore the opinions, evaluations and indications of the students about their attendance to classes at Sapienza during phase 3. We believe that their accounts - although located within the context of a single university - may contain useful hints for an educational re-design of university activities in the post-pandemic period.

Methods

A questionnaire was distributed through the application Google Form to Sapienza students in November 2020 during the first semester of lessons. Items concerned the following topics: personal information (age, gender, field, year of attendance), benefits and problems for both at distance and in presence attendance; students’ educational preferences and suggestions for changes. Participants were recruited during in-person class attendance and snowball sampling. Students were required to sign an informed consent and they responded anonymously. Students participating were 801, of which 30.5% were males and 69.5 % females. Mean age was 22.5 years. The 25% of the students were enrolled in the first year. Participants were distributed in different Sapienza Faculties (Table 2).

Table 2. Students' distribution per Faculties

Sapienza Faculties	N	Percentage (%)
Medicine and Psychology	197	24,6
Political Sciences, Sociology and Communications	132	16,5
Information Engineering, Informatics and Statistics	95	11,9
Humanities	81	10,1
Pharmacy and Medicine	61	7,6
Mathematics, Physics and Natural Sciences	59	7,4
Civil and Industrial Engineering	51	6,4
Economics	46	5,7
Medicine and Dentistry	31	3,9
Law	26	3,2
Architecture	22	2,8
Total	801	100

Descriptive statistical analyses (frequency and percentage) were applied to the data set to describe the distribution of answers to closed questions. A qualitative content analysis (Alby & Fatigante, 2014; Graneheim & Lundman, 2004; Hsieh & Shannon, 2005;) was performed on the open-ended question in which students were asked suggestions for improvements to educational activities in phase 3.

Results

We present (Table 3) the frequency of distribution of all the answers given by students to the questions of the questionnaire, analyzing and discussing in the following the most relevant and interesting results.

Table 3. Questionnaire (questions and answers)

Questions	Answers	N	Percentage (%)
1. How many lessons have you attended in this semester (distance or face-to-face)?	All or the majority of the lessons	627	78,3
	Half of the lessons	105	13,1
	Few lessons (2-3)	42	5,2
	None	27	3,4
	Total	801	100
2. Sapienza has decided to propose a mixed mode teaching (allowing attendance in-person and remotely). In your opinion this was a good educational choice?	Yes	666	83,1
	No	135	16,9
	Total	801	100
3. How did you attend the lessons in this semester?	Remotely	528	65,9
	In-person	189	23,7
	In person for some classes and remotely for other classes	64	7,9
	Other	20	2,5
	Total	801	100
4. Was the information on how to book attendance in the classroom clear?	Yes	216	88,2
	No	29	11,8
	Total	245	100
5. Did the classroom attendance booking system work well?	Yes	426	53,2
	No	375	46,8
	Total	801	100
6. Did you find it useful to be able to attend some lessons in person?	Yes	487	60,8
	No	314	39,2
	Total	801	100
7. Was the information on how to participate remotely provided clearly?	Yes	726	90,6
	No	75	9,4
	Total	801	100

8. Was the process of connecting to the lessons remotely simple?	Yes	743	92,8
	No	58	7,2
	Total	801	100
9. Have you encountered problems in following the lessons remotely?	No	545	68,0
	Yes	256	32,0
	Total	801	100
10. Did you find it generally useful to attend the lessons remotely?	Yes	704	87,9
	No	97	12,1
	Total	801	100
11. Do you also follow courses in which laboratories or workshops are provided online?	No	416	51,9
	Yes	385	48,1
	Total	801	100
12. (If yes) Have the remote laboratories maintained their characteristics of involvement and professionalization?	Yes	230	59,7
	No	155	40,3
	Total	385	100
13. Do you miss any aspect of face-to-face lessons while attending classes remotely?	Yes	660	82,4
	No	141	17,6
	Total	801	100
14. (If yes) What do you miss the most among the following aspects?	Interaction with the other students	460	69,7
	Interaction with the professor	128	19,4
	Both	56	8,5
	Other	16	2,4
	Total	660	100
15. If you could decide, which mode of class attendance do you prefer?	In-person, face-to-face attendance	332	41,5
	Mixed mode (remote and in-person attendance)	231	28,8
	Remote attendance	189	23,6
	No preference	49	6,1
	Total	801	100

16. Would you improve something in the organization of teaching this semester?	No	412	51,4
	Yes	389	48,6
	Total	801	100
17. What do you propose as possible improvements?	(open answer)		

Lesson attendance and laboratory activities

Attendance to classes in the phase 3 results to be high: 78.3% of the students attended all or the majority of the classes and 13% participated in about half of them (cf. question 1). Most of the students attended lesson only at distance (66%), while 32% alternated in-person and streaming synchronous attendance (the remaining 2.5 %, were not attending lesson in this semester) (question 3). Most of the students (83%) believed that the mixed modality -that combines in-person and remote synchronous teaching- was a good educational solution for facing the Covid limitations (cf. question 2). For the 60,8 % of the students also in-person attendance in the classroom, even if limited, was useful (cf. question 6). Almost all the students (90, 6%) believed that the information provided for remote attendance (timing, link for classes in streaming and so on) was clear, and almost no one (92.8%) complained of technical problems in taking classes remotely (cf. questions 7-9).

More controversial is the students' evaluation of the PRODIGIT booking system provided by Sapienza to regulate and monitor the presence of students in the classroom: as many as 47% of students say they have had problems using it (cf. question 5). This problematic use of the system could have contributed to the fact that the number of students in attendance in the classrooms was, in all courses, almost always lower than that allowed by the system itself. A different situation emerges with regard to the attendance to workshops and laboratory activities. About half of the students (48%) stated that they were attending courses that included a laboratory session (cf. question 11). Most of these students (60%)

thought that the remote attendance to workshops and laboratories have lost many of their typical characteristics of their direct and active involvement and participation (in educational activities, and were, therefore, much less effective as a learning experience (cf. question 12). This result indicate that it would have been more productive to differentiate the organization of attendance according to the type of educational activity (as has been done, for example, by the University of Bologna).

Students' evaluations and preferences

The majority of the students (88%) gave a positive assessment of the mixed modality of class attendance provided in phase 3 (question 10, Table 2). Nonetheless, nearly all (82%) stated that they missed some of the features of traditional face-to-face classes (cf. question 13). In particular, interactions with other students (70%) and with the professors (19%) or both (8%) are especially craved (cf. question 14).

In accordance with this desire for social interactions, a substantial number of students (41%), given the choice, prefers the traditional face-to-face mode for classes attendance (question 15). However, it is worth noticing that about a quarter (23.6%) of the students stated that, if they had the choice, they would prefer to attend lessons remotely, and almost as many (28.8%) stated that they prefer the mixed mode experimented during phase 3. Only 6.1% of the students did not express any preference.

What to improve of phase 3 blended teaching?

About half of the students (48,6%, 389 students) believed that there are improvements to make in the teaching organization they experienced during phase 3 (questions 16 and 17). The improvements proposed by the students were grouped into thematic categories (Table 4). We are going to explore the most relevant.

Table 4. What do you propose as possible improvements?

Thematic categories	Frequency	Percentage (%)
Technical infrastructure	155	30,6
Student-professor interaction and participation in educational activities	81	16,0
Learning materials	61	12,1
Professors' technical expertise	46	9,1
Relation between mode (remote/in-person) and educational activities	31	6,1
Assessment methods and exams	26	5,1
Temporal organization of classes	17	3,4
Attendance modality	32	6,3
Generic improvements	30	5,9
Organizational requests	14	2,8
Other	13	2,6
Total	506 ¹	100

Improving the technical infrastructure

With the blended teaching of phase 3, Sapienza has developed an on-line booking system for the management of students' attendance in the classroom (Prodigit). Sapienza also potentiated the technological infrastructure of the classrooms (internet connection, webcam, environmental microphones, computers, etc.). Despite this investment, 30.6% of students highlighted numerous critical issues for which various possible solutions are proposed:

- Enhancing the internet connection (“often it is not possible to hear the professors due to interference or a drop in the connection”) and the technological equipment of the classroom, including the use of microphones, HD webcams and digital whiteboards (“professors must use the graphic board and not the class blackboard, because you cannot read, and it is impossible to follow”);

¹ The number of responses is higher than that of the students because some students have suggested changes that fall into more than one category.

- Promoting the use of a single and common videoconferencing platform for streaming lessons to simplify students' participation;
- Providing more technicians who would check the correct functioning of the technological devices in the classrooms before each lesson and assist the professors in case of problems and inconveniences (“provide technical assistance to the professors”; “technicians that check the classrooms before and after each lesson”);
- relying on a more flexible booking system that would provide the students with the possibility of booking (or joining a waiting list) in case of available seats. A system less tied to the rigid weekly shifts based on the students' ID number that would allow to cancel reservations and free up space in the classroom for students willing to attend (“in class we are much less than the number of seats available”).

Improving student-professor interaction and students' participation in educational activities

This category (16% of the answers) includes requests from students to safely attend university sites (such as libraries and study rooms) and requests for a greater interaction and dialogue among students and between students and professors, also through more engaging, involving lessons. Suggestions are organized in the following three topics.

- More attention to students in remote attendance. Students complained about the perceived disparity between those present in the classroom and those in remote attendance: these latter often feel isolated and excluded from the lesson (“I would point out to the professors that, despite having some students in the classroom, they must not forget that most of the students are connected remotely. Sometimes it can happen that we feel excluded”). The suggestion is therefore to provide “equal treatment” during lessons in mixed mode: “some professors do not realize that they cannot chat with students in the class forgetting about the other students online, also since we are the majority”.
- Meeting opportunities with professors and the introduction of tutors for online activities. The students believed that the opportunities for direct interaction with the professor should be increased, as used to happen informally at the end of traditional face-to-face

lessons. Furthermore, the students believed that the figure of a tutor would be useful for the activities to be carried out remotely (“the presence of online tutors would be a great benefit in helping the students to understand the subject studied, as well as in helping the professors, who found themselves answering many e-mails from students for clarification on the lessons”).

- Promoting the use of subgroups and small groups. The students proposed to divide the attending students into “shift groups”, especially in the case of very numerous courses. According to the students, this breakdown of students into subgroups would allow greater interaction not only with the professor but also among students, even with the mixed teaching modality (“division of numerous courses into smaller groups would allow a greater interaction through the microphones -given that reading the chat means interrupting the teacher’s concentration”; “doing shifts with smaller groups if you are unable to manage an entire class within one video call”).

Students also suggest to plan activities to be carried out in a small group that can better support the learning of “practical knowledge” and offer more opportunities for interaction and socialization (“I would propose group work among students to keep alive the interactive and the social aspect of the university, which is completely lost with mixed and distance teaching”).

Improving learning materials

According to the students (12,1% of the answers), providing complete and accurate educational materials for all the courses, sharing them in advance, would support the students in better following the explanations during the lessons. Moreover, consulting the materials or the recordings of the lessons during the study would be very useful in the preparation of the exams (“having the professor’s explanations available and accessible at any time may be useful for clarifying doubts, concepts and reviewing notes”).

Improving professors’ technical expertise

Students (9.1% of the answers) propose to implement training activities to improve the professors’ skills in the use of the technological

infrastructure for conducting lessons in mixed mode. In fact, students complain that this lack of competence on the part of the professors has caused several problems in the management of the lessons (“A course for professors to avoid any technical problems during the lesson, for example they have to know what to do if the LIM -multimedia interactive whiteboard- is not visible in telematic mode”).

Considering the relation between mode (remote/in-person) and educational activities

The students (6.1% of the answers) suggest diversifying the modalities of participation in the theory lessons with respect to the laboratory classes (diversification foreseen by the DCPM, but not endorsed by Sapienza), carrying out the former exclusively remotely and the latter in presence.

According to the students, therefore, for theory lessons there would be less need for direct interaction with the professor and the other students, and it would therefore be possible to use the lessons in streaming (or recorded). Laboratory and practical activities should instead be carried out face to face and in small groups (“workshops done remotely are useless: they are not interactive, they are not practical, they are not interesting”).

Improving assessment methods and exams

The exams in phase 3 were carried out remotely, which created a number of difficulties for students and professors. The students (5,1% of the answers) suggest:

- To better inform on the methods and procedures for carrying out the exams;
- To introduce common procedures for all the courses (“each professor currently uses a different platform and problems arise every time”);
- To promote intermediate tests during class attendance;
- To change the exam methods (written /oral) in relation to the teaching mode (“the distance exam methods should be reviewed, facilitating the written method that is completely set aside in favor of the oral exam, even for courses in which the writing is preferable given the quantity and specificity of the concepts”).

Improving the temporal organization of classes

The students (3.4% of the answers) underline the difficulty of spending many hours in front of a computer screen to follow many lessons in a row (“we find ourselves spending 8 hours in front of a screen without breaks”). They propose to reduce the hours of lessons in one day by structuring shorter teaching sessions and to redistribute them over several days during the semester so as not to have too high a number of hours per week.

Attendance modality and the other categories

The answers in the remaining categories represent suggestions on the lessons attendance modes that have been already accounted for in the answers to the closed questions, and general and unspecified organizational improvements, not related to phase 3 (“improve everything”).

Discussion and conclusions

Unlike of what emerged in the surveys conducted during the first pandemic phase, our results contain useful indications for a sustainable pedagogical integration of forms of distance learning within “traditional” universities. Undoubtedly the pandemic has forced universities to experiment new ways of attending lessons which, despite the critical issues highlighted, meet the needs and preferences of a range of students. 52.4% of the interviewees in fact declared that they preferred the mixed or all remote mode of lesson attendance. Therefore, it is reasonable to expect that, in a post-emergency time, it will be possible (and even desirable?) to multiply paths of class attendance. In this perspective, however, in order to take into account the relationship between social practices and technologies, it would be necessary to redesign the teaching methods employed by universities (Zucchermaglio & Alby, 2005; Hakkarainen, 2009). The roots of the problems highlighted by the students can, in fact, be found in the idea of transferring typical practices of universities directly into digital, without a careful analysis of the ways in which remote teaching and distance learning is concretely accomplished

(Sansone et al, 2019). This is true also after the pandemic time. Therefore, the indications that come from the direct experience of the students are particularly important.

The picture that emerges of the phase 3 is that of a very complex management of educational activities. This picture calls for greater technical and didactical support (e.g., through tutors, cfr. Cacciamani et al., 2019), as it is already done in only-telematic universities. Greater flexibility is also required in the teaching methods, in the assessment methods, in the temporal organization of teaching. The indication is to reconsider the temporal organization of the lessons (duration of the single lesson, number of hours of lessons per day, duration of the semester), which is often dictated – even before the pandemic - more by the needs of the university or professors and not based on a consideration of the time needed for studying and learning by the students (Ritella et al., 2019; Zerubavel, 1981). Moreover, as a result of online teaching's integration, students report an increased need for educational materials, such as recordings, slides, notes, to be used as a proxy for the interaction with the professors and more generally for the university life. The explanations and conversations that in usual times would be discussed in the classroom or during breaks or in informal discussions with the professor and other students can, according to the students, find a “material” substitute in such artifacts.

What the students are missing the most and strongly demand are more opportunities for interaction, participation and socialization. These requests ask for an educational redesign of the lessons that takes into account the importance of the social context for learning and building knowledge (Pontecorvo et al., 1991). In remote teaching, it is even more necessary to provide moments of collaboration between students, beside that between students and professor. More opportunities for small group interaction and discussion, as well as for socialization and participation in university life must be planned (Cesareni & Sansone, 2020).

Professors are required to acquire technical but also interactional skills: it is a matter of learning to interact with a “split class”, to manage which they need to use different resources and skills from those

used in traditional educational activities (Dias-Trindade et al., 2020; Henderson et al., 2015). Professors need to respond to the requests of students in remote attendance to be “seen” and “heard”, to have equal treatment as their colleagues physically in the classroom.

An interesting suggestion is to differentiate the mode of attendance based on the educational objectives, carrying out the theory lessons remotely and the workshops and practical activities in person. Although this distinction between theoretical and practical activities is somewhat simplistic, the suggestion to use more flexible forms of instructional design should be taken seriously by universities.

Students in fact suggest for the adoption of a truly blended approach to planning and foster educational activities at the university (Ligorio & Sansone, 2016). This is a suggestion that the university can and should take up in order to innovate its traditional educational practices and allow more and more students to participate and attend in the future.

Among the limitations of this study, there is that of considering only the point of view of the students (and only on what they had experienced during phase 3), while it would be equally essential to listen to the opinions of the professors, whose great commitment made possible to cope with the emergency of the pandemic. We hope that this is therefore one among many other contributions that will allow us to work on new future “blended” scenarios, in which distance and presence can become components of a virtuous combination, capable of enriching the quality of university teaching as a whole.

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