

The Emergence of the Emergency in Higher Education in Argentina

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Abstract—The context of COVID-19 has deeply penetrated various aspects of university life such as academic and administrative management; teaching practices and learning have been challenged, shaken and, in some way, transformed. This article will describe an ongoing study of trends in relation to the inclusion of technologies; the representations about online teaching itself, before and during the COVID-19 emergency, and also a projection into the post-COVID and the implications for student’s achievements before and during the emergency. A comparison will be made between the data obtained from these two Argentinean universities and the information published by the IAU Global Survey Report [1] in order to develop a broader map about the challenges ahead for Higher Education (HE). Besides, the article will include some inquiries about whether post-pandemic pedagogical practices will change according to teachers’ own views. Based on the results of the survey, we have delved into a qualitative study that focuses on changes in teaching and assessment practices in HE that allow us to extract from the voices of practicing professors with many years of experience, possible scenarios that account for transformations in teaching practices and ways of learning for the next few years. The empirical statistical survey carried out on more than 400 professors and the in-depth qualitative study offer results that are enlightening to review, in addition, management, training and relationship decisions with the student body for the coming years.

Keywords—COVID-19, higher education, learning technologies

1 Introduction

The “network society” [2] [3] constitutes the contextual framework within which both the scope of education technology as a field and the reasons for including technologies in education must be reviewed. On the one hand, information and communication technologies are expanding and are part of central activities in society including the economy, research, and social movements. On the other hand, they are starting to support the emergence of a cognitive ecology that interpellates the literate culture, including not only the forms of specialized knowledge but also the social and cultural trends

in which young people have central participation and which demand a review of teaching practices [4] [5] [6] [7] [8] [9].

In the last few years, many reports have studied trends observed in practices impacted by technology in educational settings, explicitly stating the learning possibilities offered by information and communication technologies in higher education. These reports highlight the extended opportunities for continuous, active, personalized and rhizomatic learning [10], game-based learning and the culture of doing [11], story and event-based learning [12] and dynamic and incidental learning [13]. A prospective study addressing the challenges faced by European educational policies for the 2020 horizon, based on experts' opinions, indicated that as a result of the evolution of the information and communication technologies, constructive and student-centered pedagogies will become trends, and personalized learning as well as individual coaching will be more common, with a focus on generic, cross-cutting and intersectoral skills [14]. Moreover, based on a systematization work of the most relevant prospective studies, [15] conclude that the challenges mentioned for higher education are notably recurrent and that knowing the trends makes sense only if political action is taken in order to change the orientation of initial and continuous teacher training programs. In this sense, there are several studies which have been creating analytical categories about technology-mediated education (face-to-face and online). This study specifically explores the situation arisen as a result of the pandemic in relation to online education.

The UNESCO IESALC estimates show that the temporary closure affects approximately 23.4 million higher education students and 1.4 million teachers in Latin America and the Caribbean; this represents approximately more than 98% of the region's population of higher education students and teachers [16].

According to a survey developed by the OECD about E-Learning in Higher Education in Latin America, before the COVID-19 pandemic face-to-face education was still highly prevalent being the predominant model in 65% of the universities, compared to 16% with a predominant hybrid model and 19% centered on e-learning. Particularly, in Argentina, virtual education is still at the early stages of development. However, there is a considerable number of virtual education programs in Argentina. One case worth highlighting is the Universidad Tecnológica Nacional (UTN), which provides the entire university community with access to a range of ICT resources through its UTN Virtual platform. The UTN also has a Global Virtual Campus platform, a pilot project it set up in 2007 to provide access to seminars and virtual classrooms which supplement subjects taught using face-to-face learning at the university's various sites [17].

Other very important and long-standing distance learning program is the one developed by the Universidad de Buenos Aires (UBA) with the denomination UBA XXI. The UBA XXI university admission program was created in 1986 and is taught completely online. In other words, it has been in place for over 30 years and takes on approximately 100,000 students every year. In its beginning, it was a Distance Education Program which included booklets, radio, and TV programs. From 2008, it added a virtual environment for teaching all the required university entrance courses.

2 About the universities involved in this study

The Universidad de Buenos Aires (UBA) has 13 Schools, around 30,000 teachers and over 400,000 students. It is one of the best ranked Universities in South America and it was created in 1821. It is located in the Autonomous City of Buenos Aires and its Schools and Rectorate are distributed among various neighborhoods. It is run by governing bodies made up of representatives chosen through a democratic voting system divided by areas (Faculty members, Graduates, Students and Non-faculty staff). Each of the 13 Schools has their own governing body (Governing Council, composed of teachers, graduates, students and non-faculty staff) to make decisions. In addition, each department chair is free to make didactic and curricular decisions at their discretion as long as they are in line with institutional guidelines. As a result, there is a variety of curricular and didactic approaches considering each institutional context and each teacher in particular.

The Universidad Tecnológica Nacional (UTN) is a Higher Education Institution exclusively devoted to STEM education and, in that field, it is the most important university in Argentina. It was created in 1948 and currently has 30 regional schools across the Argentine Republic, with approximately 11,000 professors and 85,000 students. In addition, it is the only federal university and that feature results in each school having its own strong identity, related to the region where they are located. Like the UBA, and all state-run public universities in Argentina, it is governed by a democratic system of government with representatives from all sectors of the university community both for running the University and each of its schools.

3 About the study

The data and information collected in this study are relevant since they provide the viewpoint of teacher colleagues from two institutions renowned not only in Argentina but also in the region and, in addition, they show the perspectives from various disciplines and different regions across the country. Although other surveys have been conducted about the impact of the pandemic on Higher Education¹², most of them collect data from private and/or very small universities, a fact that might lead to important biases in the results due to the very specific features of such institutions. This study comprises more than 400 individuals from 8 different provinces and, since it uses a quantitative as well as a qualitative methodology, it yields results which, in our view, provide a description which is quite close to the reality currently faced by Argentine universities and what might be expected in the near future.

This work is part of a research conducted in 10 universities from different countries in three different continents (North and South America, Europe, and Asia). The study described in this article was carried out in two phases, a quantitative one, in which a

¹ <https://www.untref.edu.ar/mundountref/encuesta-coronavirus-comunidad-untref-afectada>

² <http://noticias.unsam.edu.ar/2020/06/10/resultados-preliminares-de-la-encuesta-sobre-ensenanza-y-aprendizaje-en-tiempos-de-cuarentena/>

survey was distributed among approximately 450 university professors of both institutions, and a qualitative one, in which 20 teachers (10 from each university) were interviewed in depth.

The survey was divided into three parts. In each of them, the participants were asked about teaching before, during and after the Corona-Related Teaching Situation (CRTS), respectively. The survey included a total of 27 questions, inquiring into the use of technology tools in lessons, the extent to which teaching has been enriched by the use of such tools, the reasons for not using them, perceptions about the teaching experience and changes in teaching practices, the institutional support received in terms of training, students' achievements (any changes compared to face-to-face lessons), the types of tools used (synchronic meetings; virtual environments) and their relation with teaching, and the possible impact on teaching after the CRTS, among other questions.

In the in-depth interviews, the focus was placed on the interviewees' personal opinions about the possible transformations in terms of conceptions of teaching and didactic strategies used, during the CRTS and in the future. Questions were asked about the context, the teaching practice, the impact of distance education on teaching practices, institutional perspectives, and expectations about the future return to normal classroom activities.

Seventy percent of the participants from UBA are full-time teachers while most of the participants from UTN are part-time teachers (63% of them work less than 12 h a week). In both institutions, the age of the participants mainly ranged between 46 and 65, with more than 18 years of teaching experience at the university.

They characterize themselves as very good to excellent teachers (46.9% at UBA and 35.3% at UTN) or good (43% at UBA and 54% at UTN), that is, they have a highly positive self-perception as university professors.

4 About the results

4.1 Most popular strategies and tools

One prominent trend observed is that before the CRTS, the use of technology tools by teachers ranged from very little to moderate (74% on average in both institutions). As a result of the Preventive and Compulsory Social Isolation (in Spanish, ASPO), they were able to review the strategies and tools used and now consider that technologies enrich their teaching practice (Figure 1). This shows a change in the representation about the value of technology tools for university teaching. It is true that the context forced them to use tools such as synchronous videoconferencing and virtual environments. For this reason, the most commonly used tools are synchronous videoconferencing tools, YouTube videos or videos created by faculty members, and the use of virtual environments to upload materials and various activities.

These results are in complete accordance with those obtained through a survey developed by the International Association of Universities showing that "at almost all HEIs, COVID-19 affected teaching and learning, with two-thirds of them reporting that classroom teaching has been replaced by distance teaching and learning. The shift from

face-to-face to distance teaching did not come without challenges, the main ones being access to technical infrastructure, competences and pedagogies for distance learning and the requirements of specific fields of study. At the same time, the forced move to distance teaching and learning offers important opportunities to propose more flexible learning possibilities, explore blended or hybrid learning and to mix synchronous learning with asynchronous learning [1].

Furthermore, according to the results of the study described in this article, most professors point out that they feel capable of including digital tools as long as they receive proper training, since they state they lack pedagogic experience in relation to them (67.4% at UBA and 83% at UTN). The institutional contexts are different, but the trend indicates a lack of training in the use of technology for university teaching.

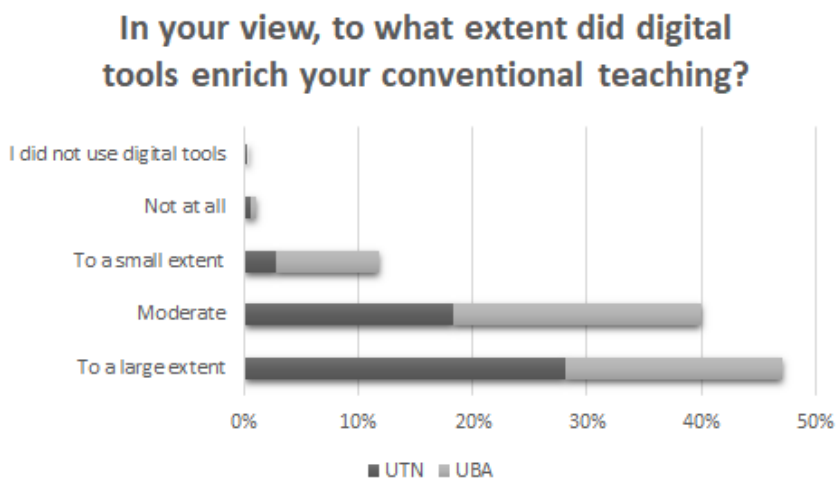


Fig. 1. About teaching with digital tools

In a regional study conducted by the IDB and the Monterrey Institute of Technology between February and March 2020, more than 800 university teachers were surveyed about the penetration of digital technologies in universities. According to the results of such study, 90% of the teachers considers that digital technologies are useful for improving learning processes. However, there are important challenges for the adoption thereof [18].

In teachers’ words:

“We have to teach online, there is no choice. So, I have to look for the best tool which will not only allow me to do so but also be easy for students to use, especially if they are not familiar with it.”

“I think I was able to rediscover the usefulness of the virtual campus or, actually, to enhance the use I make of it. Also, I incorporated resources such as videos and H5Ps that definitely help students understand certain contents and now I wonder: why didn’t I incorporate them before? ... I think this pandemic is an opportunity to take advantage of the flexibilization of certain points of view, which have seen the usefulness of such tools.”

“The positive side of this situation is that it forced us to use digital tools we already had but didn’t devote the necessary time to learn about. The campus, for example, is an excellent tool that we were using very little and now is our main tool. This special situation compelled us to take a huge step in a very necessary area, considering that students use digital tools more and more every day, thus bridging that real gap in the use of technology.”

4.2 Vision for change in teaching practices during and after the CRTS

Perceptions about technology tools and changes in teaching. The survey reveals that the transformation experience towards technology-mediated practices is regarded as a positive experience by 63.5% of the teachers and that 80% of them believe that their new experience with the use of digital tools will affect their pedagogic practice (Figure 2). In addition, they think that this experience has helped them to be prepared for future similar situations (62%). This implies that there is a vision for change in the pedagogic practices for the learning experience, but there are not any certainties that these changes will be reflected in higher education teaching practices in the future. This is something that will have to be studied in the coming years, verifying what has been learned and how this will affect future practices.

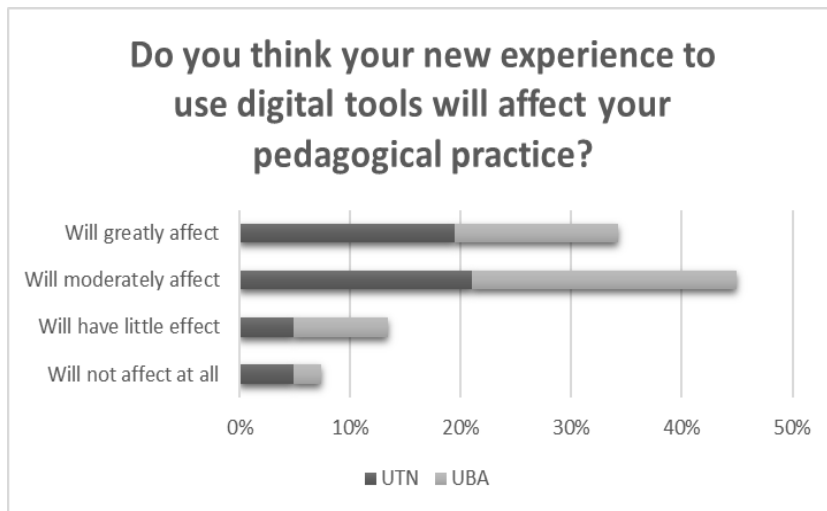


Fig. 2. About pedagogical practice

These results are in line with the situation observed in other countries, as shown by a survey recently conducted by the EDUCAUSE organization, which clearly indicates that most teachers agreed on the fact that they are now more prepared to teach online than before the pandemic and that online education in their institutions has improved considerably [19].

On the other hand, a trend is observed which shows that it has been a complex experience that required time, support, and teacher commitment.

In those disciplines oriented to professional practice, a point is recurrently made in relation to the difficulty regarding transfer to professional practice. Teachers, particularly in the areas of health and design, stress that there is practical knowledge which cannot be transmitted through digital technologies and pose a question as to which are the most valuable technology tools to articulate with practical knowledge (simulations? virtual reality?) Similar comments were made by technology teachers in relation to laboratory practices.

In teachers' words:

"It has been a complex experience, it requires more dedication than I expected, but it has been positive and inspirational. It demands much more dedication from the teacher, but it is very useful for those students who work and cannot attend lectures. In courses where practice is required, that laboratory practice part will remain pending because students need to acquire the abilities and behavioral content related to the laboratory setting."

"The class I teach is experimental and it focuses on students' work in the laboratory (drug manufacturing) (...) this was not a choice we had but a situation to which we had to adapt, although a good one, since we learned a lot from it."

"Of course, the essential practical learning that we will have to offer when we return to face-to-face teaching is lacking work in the laboratory, visits to industrial plants, etc."

"It is very complex to work remotely in design courses."

According to the information collected, there seems to be a certain difference regarding the type of discipline in question ...

In this sense, some distinctions are visualized in relation to the disciplinary fields and the implemented strategies that will have to be addressed in more detail in future studies.

Regarding the impact in the future, all the answers suggest that there will be a before and after as regards the way in which higher education will develop (Figures 3 and 4).

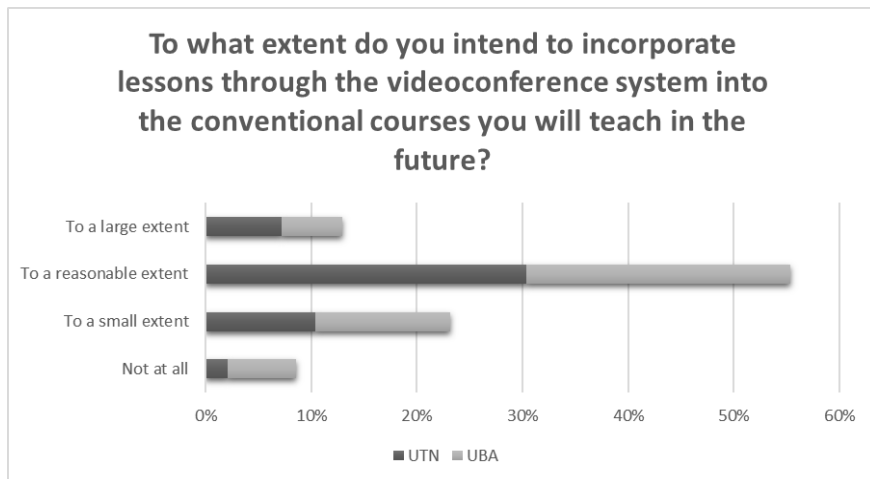


Fig. 3. About the future 1

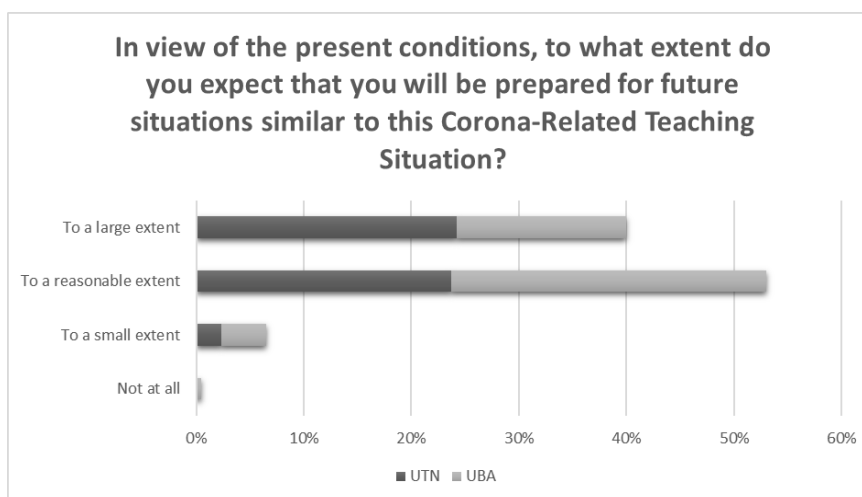


Fig. 4. About the future 2

When teachers were asked about the possibility of their courses becoming virtual in the future, the responses were not as categorical (Figure 5), but they show a trend that is much higher than what would have been if the consultation had been carried out before the experiences they are going through this year.

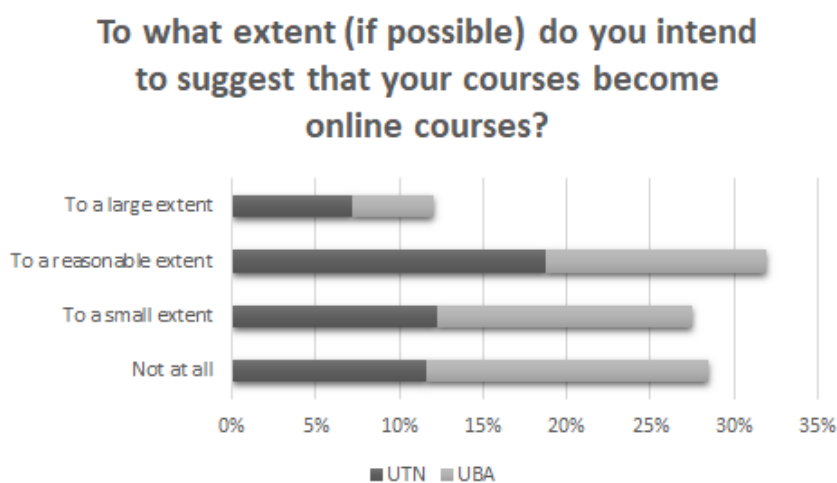


Fig. 5. About the future 3

Feelings. On the one hand, there is also a certain lack of knowledge in the use of these tools because there was no need to use them (prior to the CRTS).
In teachers' words:

"In the past, I did not use digital tools mainly due to unawareness and lack of familiarity with them. In addition, in most of the courses I participated, there was little encouragement to use digital tools."

"I used to teach face-to-face. I used - and considered - remote tools mainly as a complement, not as the core of a teaching system."

"There was no tradition in the discipline, the use of technologies was not the rule."

On the other hand, there are feelings of ambivalence and stress:

"It is an ambivalent experience. On the one hand, it is a positive one since it was possible to establish contact with the students, creating a space for support and communication, but it has also generated frustration. A lot of work has been done creating content and planning it, knowing a priori that no resource is good or bad in itself but that it depends largely on how it is used. On the other hand, in the CBC (Common Basic Cycle), the virtual campus was not friendly in the beginning thus generating much back-and-forth communication with the students. To this, we had to add teaching with Zoom, which at times becomes complicated, from the technological aspect (Internet cuts out within minutes of starting classes) to the operational one: one speaks to a shared PowerPoint presentation or in the best of cases to a "small square" because many students disable the video."

Regarding feelings, there is variability in the responses:

"I lack personal contact with the students and being able to observe if they are understanding."

"I'm tired. The preparation of material in new formats and the acquisition of new habits, simultaneously with the permanent cohabitation with my family, means a great effort."

"I cannot yet define my feelings; they will depend on the result at the end of the course."

In summary, it could be said that the feelings expressed by teachers are a mixture of stress and overexertion largely generated by the unforeseen situation they had to face without adequate preparation and, on the other hand, the positive and encouraging experience of having been able to guarantee, to a lesser or greater extent, the continuity of the courses during the CRTS, discovering tools and methodologies in that process which, a priori, were alien or strange to them.

4.3 Strengths and weaknesses of distance education

In the case of the Universidad de Buenos Aires, the surveys reveal a critical look at institutional decisions. The same is not the case in UTN, in which 85.7% of those interviewed assure that the University is, to a large extent or to a moderate degree, prepared for a similar future crisis situation (Figure 6). This difference could be due to the fact that UTN began the conversion to virtual mode almost immediately after the quarantine started, which forced education institutions to close, while the UBA, on the other hand, took a few months to start that process.

In view of the present conditions, to what extent do you expect the University to be prepared for a future crisis situation similar to this?

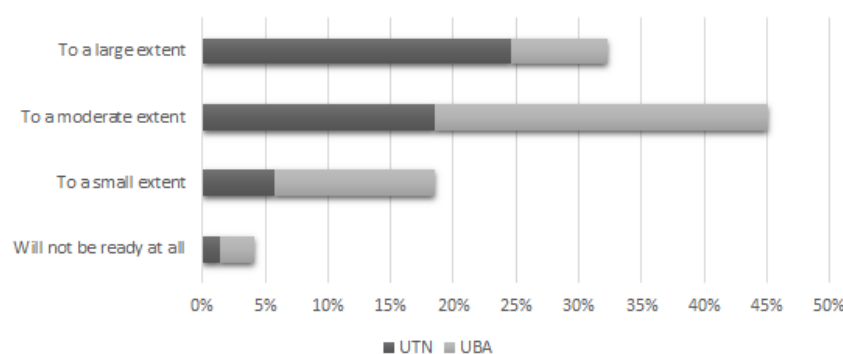


Fig. 6. About the future 4

On the other hand, they recuperate the specificity of online teaching and the challenges involved in teaching with technological mediation.

In teachers' words:

"The material, technical or environmental conditions are not suitable to do it. There is also practical knowledge that cannot be transmitted by ICTs."

"It is an opportunity to approach teaching in another way, perhaps face-to-face and online, a good resource to complement teaching and maintain a more personal interaction with the student."

"It is a greater effort because we did not have the materials ready. Furthermore, it is not feasible to teach some content online and it is impossible to organize any field trips; both things require to be completely redesigned in very little time."

"The impact of the experience in the future will depend on the possibility of reducing the demand for face-to-face lessons; otherwise it will be an overload for the students."

Regarding students' performance, the opinion is divided between higher and lower performance in comparison with face-to-face lessons. This ambivalence and duality may be due to the diversity of strategies implemented...

Those who assess their success in this transformation point out that it is due to the pedagogical support of their reference institution and not to their own technological skills.

5 Qualitative study

The qualitative study was carried out two months after the quantitative study was completed and five months after the ASPO began. The qualitative study provides a deeper insight into what was revealed in the quantitative study. In general terms, a feeling of exhaustion is perceived in relation to online tasks, follow up requirements and the design of materials in online teaching.

5.1 Context

Of a total of ten interviewees, in the case of UTN, one half belongs to the Department of Basic Sciences courses and the other to the engineering courses. Those belonging to the engineering courses Departments carry out activities in their profession outside the university. In the case of UBA, they are professors who work in different disciplinary fields.

Those who do not have an undergraduate degree in teaching have taken various teacher training courses during their professional career. In the case of UBA, the CITEP (Center for Innovation in Technology and Pedagogy) offers training in distance education and educational technology to the entire faculty of the University.

In teacher's words: *“Never has a course been more appropriate (speaking about a teacher training course developed in the second semester of 2019). If someone had told me that I would need to apply the tools that we worked on last year in such a vertiginous way, I would have asked them to stop fantasizing, and said that we must give time to time, but reality prevailed. It's been quite an experience.”*

5.2 About the teaching practice

All interviewees responded that they consider themselves good teachers and justify their statement based both on the results of the student surveys and on their permanent professional updating.

With regard to the ways of teaching in this new context, all the interviewees use videoconferences via Meet or Zoom and complement their online lessons with other technological tools.

5.3 About the impact of distance education on teaching practices

In the case of the UTN, the teachers interviewed did not feel very affected in the new context because all of them had previously begun to use various technology tools in their lessons. Some highlighted that they feel satisfied with the recognition and appreciation that their previous practices acquire in this new context. In the case of UBA, there are variations in the responses, and these depended on the institutional support of each academic unit.

Although none of the interviewees stated having had much trouble with this new teaching method, some pointed out that their environment (family, children, lack of comforts at home, etc.) affected them and some suffer from severe muscle stiffness due to excessive use of the notebook.

UBA teachers agree on the fact that it has been a year in which they simplified the tasks because they did not manage to carry out proper student follow up. In this sense, unlike previous years, they incorporated self-assessment questionnaires and consultation forums.

On the other hand, they mention certain stress and fatigue, a day-to-day job, in which they had to resort to creativity and organization which they lacked in the department.

There were several examples of good practices, and the frustrations mainly had to do with the fact that the tool used (Moodle classroom, mathematical software, etc.) did not respond to their planning as well as they had expected and, in some cases, that the students did not respond, as planned by the teachers, to their various pedagogical proposals. In many cases, annoyance was manifested by the teachers due to the impossibility or refusal of the students to turn on their cameras. In other cases, there were difficulties in the organization of synchronous meetings due to the number of classes that the students have daily.

5.4 Institutional perspective

In the case of UTN, the interviewees highlighted the importance of the implementation of various online courses in the institutions to facilitate the use of new resources. Some point out that they felt a bit lonely and that they waited for the Department or Chair authorities to write to them individually to find out how their practices were developing and if they needed anything. On the contrary, in the case of UBA, we found that there was a disparity regarding institutional support, and this influenced remote work.

Regarding the question referring to whether they felt that they were able to work freely, some answered affirmatively and valued this circumstance, while others claimed that they wished that the Department Chair would have established the form of evaluation rather than leaving the decision on evaluation modality to the teachers.

5.5 Return to classroom activities

All those interviewed agree that the return to classroom activities will be a mix between online and face-to-face teaching and that this change will be promoted by both teachers and authorities and will also be driven by the students themselves.

This situation is presented, however, as an uncertainty and a redefinition of what "the new normality" will be like.

6 Conclusions and debates

The title of this work refers to the "Emergence of Emergency" since, in effect, the health emergency led, in the educational system, to the emergence of practices that had remained latent for a long time. Such is the case of the massive use of available technological resources and, fundamentally, of the development of teaching and learning modalities that until now had not been considered, especially in the field of Higher Education. The way in which the educational system has faced this emergency would not have been possible just a few decades ago because the technologies that available today simply did not exist. Clearly, what is still necessary, if not essential, is teacher training in the proper use of these technologies and, furthermore, improvements in terms of connectivity and availability of hardware resources for both students and teachers.

6.1 What are the changes brought about by the pandemic to higher education according to this study?

On the one hand, from the quantitative study, we can conclude that the use of technologies increased compared to what had been used before COVID 19. That is, the context forced the use of synchronous tools and virtual environments. At this point, we found that the support of the University was important for the feasibility of good practices through teacher training. In those cases, in which they were able to access tools and training, teachers recognized that they were able to carry out their task better. Moreover, we found that there was a high degree of adaptability despite not having chosen this modality. In addition, we found that many teachers consider that they have managed to improve their lessons with the inclusion of technologies and generated other bonds with their students. Finally, there is a recognition of diverse good practices according to each professional field. In the case of academic fields that require a high load of professional practice, working online has been more complex.

6.2 What are the changes that could occur in the future after the emergency is over?

It is difficult to determine whether the incorporation of technologies will remain as a learning experience in the coming years. The truth is that there is agreement on the need for a mixed modality that includes online and face-to-face teaching in its planning and didactic deployment. However, from the answers obtained, it is estimated that, in future lessons, virtuality will be present in the use of some tools that teachers have considered extremely useful: use of virtual environments; synchronous meetings to explain some topics; individualized follow up of students. As Manuel Castells expressed in a recent interview³, "the hybrid university is already the rule. Accepting that reality is a matter of time. The forced learning experience in this pandemic allows us to take a leap forward in the new pedagogical model".

It can be concluded then, following Franceso Tonucci⁴, that "... the confinement shows "even more" that the school, as we know it today, is not effective. The crisis is rapidly approaching a different future in education."

We deeply believe that this emergency we are facing will facilitate, if properly managed, the emergence of the new educational system that the 21st century society has been demanding for a long time.

7 Note

This work is part of a wider and cross-cultural study on university teachers coping with a challenging situation, "The transition from conventional teaching to online

³ <https://www.publico.es/entrevistas/castells-hay-listos-establecer-ensenanza-evaluaciones-online-completo.html>

⁴ <https://elpais.com/sociedad/2020-04-11/francesco-tonucci-no-perdamos-este-tiempo-precioso-dando-deberes.html>

teaching: Organizational and pedagogical issues”. The initiators of this study are Prof. G. Horenczyk and Dr. M. Dorfsman (Hebrew University, Israel); Dr. C. Lion (Universidad de Buenos Aires, Argentina); Prof. K. Göbel (Universität Duisburg-Essen, Germany); Prof. E. Makarova (Universität Basel, Switzerland); Dr. D. Birman (Miami University, USA).

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