

Learning to teach in times of the COVID-19 pandemic: our experience at Universidad de Buenos Aires

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Received: 20/08/20 Revised: 10/09/20 Accepted: 24/09/20 Published: 10/12/2020

Abstract

The aim of this text, is to describe our teaching role in times of pandemic, recounting how we discovered strategies to teach in times of virtual presence, as well as the search for new experiences in teacher training, highlighting the importance of how we turn them into an opportunity for our self-improvement. Procedure: We will discuss the strengths and weaknesses that we found while we were going through this new path of online teaching, set up for the first time in the undergraduate courses of our University. Conclusion: The main educational accomplishments we achieved during the pandemic course were, to establish a true flipped classroom, and to use ludic strategies that were not common in our classes. On the other hand, we highlight the close contact we fulfilled with our students, which led them to recognize with high opinion our study methodology, the knowledge acquired, the strategies used, and our commitment and teaching predisposition.

Keywords: pandemic; state university; online university; feedback; educational game.

Aprendiendo a enseñar en tiempos de pandemia COVID-19: nuestra experiencia en una universidad pública de Argentina

Resumen

El objetivo del presente trabajo fue describir nuestro rol docente en tiempos de pandemia, relatar cómo fue nuestro descubrimiento de estrategias para enseñar en tiempos de no presencialidad, así como la búsqueda de nuevas experiencias de formación docente, y resaltar la importancia de cómo las convertimos en una oportunidad de mejora sobre nuestra labor. Procedimiento: Discutiremos las fortalezas y debilidades que fuimos encontrando mientras transitábamos este nuevo camino de enseñanza *online*, establecido por primera vez en las carreras de grado de nuestra Universidad. Conclusiones: Los principales logros docentes que alcanzamos durante la cursada en pandemia fueron instaurar una verdadera aula invertida y emplear estrategias lúdicas que no eran habituales en nuestras clases. Por otra parte, destacamos el estrecho contacto con

nuestros alumnos lo cual condujo a un alto reconocimiento por parte de ellos en cuanto a nuestra metodología de cursada, el conocimiento adquirido, las estrategias utilizadas y nuestro compromiso y predisposición docente.

Palabras clave: pandemia; universidad estatal; universidad online; retroalimentación; juego educativo.

Aprendendo a ensinar em tempos de pandemia COVID-19: nossa experiência na Universidad de Buenos Aires

Resumo

O propósito deste texto, é descrever nosso papel docente em tempos de pandemia, relatando como foi a nossa descoberta de estratégias para ensinar aulas não presenciais, assim como a busca por novas experiências na formação de professores, destacando-se a importância de como as transformamos em oportunidades de melhoria sobre nosso trabalho. Processo: Discutiremos os pontos fracos e fortes encontrados, enquanto percorremos este novo caminho de ensino on-line, estabelecido pela primeira vez nos cursos de graduação da nossa Universidade. Conclusão: As principais conquistas educacionais que alcançamos durante a pandemia, foram criar uma verdadeira aula invertida e empregar estratégias lúdicas que não eram comuns em nossas aulas. Por outro lado, destacamos o estreito contato com nossos alunos o que permitiu um elevado reconhecimento por parte dos mesmos quanto à nossa metodologia de estudo, os conhecimentos adquiridos, as estratégias utilizadas, nosso empenho e predisposição pedagógica.

Palavras-chave: pandemia; universidade estadual; universidade on-line; retroalimentação; jogos educativos.

Citar como:

Castro, M., Paz, M., & Cela, E. (2020). Learning to teach in times of the COVID-19 pandemic: our experience at Universidad de Buenos Aires. *Revista Digital de Investigación en Docencia Universitaria*, 14(2), e1271. <https://doi.org/10.19083/ridu.2020.1271>

Introduction

The beginning of the Social, Preventive, and Compulsory Isolation (Aislamiento Social Preventivo Obligatorio, ASPO) in Argentina, led to the fact that university, as well as other educational levels, had to adapt abruptly to the virtual modality, overcoming different limitations. In Universidad de Buenos Aires (UBA), each school is managed with relative autonomy. In ours, the School of Pharmacy and Biochemistry (Facultad de Farmacia y Bioquímica, FFyB), face-to-face classes were to begin two days after their suspension was announced by the Rectorate of UBA. And there began the race against time.

We are aware that the best way to plan virtual courses is to start well in advance. Designing good platforms, thinking about the resources that will

accompany the students, recording the classes, and designing activities ideally would entail months of previous work. Then, we would start teaching the course and accompany the students through the end. However, the pandemic made us face virtual teaching in a dizzying way and we could only improvise. There is nothing wrong with that, we worked it out. It was tempting and the easiest thing—if we consider university students as adults responsible for their own learning—to have given students homework and let each one teach themselves: to make progress on their own, each one with their own texts, separately, and at home. However, far from this, we decided to reinvent ourselves, to resurface, and to build strategies that in one way or another would facilitate the students' learning, giving continuity to the academic process that was taking place in accordance with the curricular structure.

How prepared were we, students and professors, to immerse ourselves in distance education? What did we learn after this first experience with 100% virtual and compulsory classes? How much will remain from the strategies used when we return to face-to-face teaching? The objectives of this paper are based on the analysis of the answers to these questions. Thus, this text will aim to describe our teaching role in times of pandemic, relate how we discovered strategies to teach in times of virtual presence and searched for new teacher training experiences, and highlight the importance of how we turned this into an opportunity for improvement.

Theoretical Framework

Teaching in times of pandemic was a challenge for us as professors, and a process of adaptation to the new virtual classrooms for students, leaving behind the face-to-face classes that we were accustomed to. In response to our first question about how prepared we, students, and professors were to immerse ourselves in distance education, although we, professors, were prepared in a theoretical way, it was in most cases only to apply some teaching resources virtually, not to teach the entire subject in that modality. When we were informed that the ASPO was starting in Argentina and that classes had to continue remotely, we began to search for methodological strategies that would allow us to teach our classes. We began to ask for advice that we might have never received before, attended webinars, and took online teaching courses offered to professors, in view of the problem we were faced with.

We had to acquire new skills in record time in order to effectively use the different online learning platforms, which we learned to use on the fly. Fortunately, our students adapted to all our proposals without major problems, and they supported us on this path of mutual learning.

One of the first concerns we had, together with the entire faculty, was how to teach the classes that we had always taught face-to-face remotely. According to Peppino (2004) "it is not only a

matter of replacing the blackboard and chalk for the computer screen, but it is also necessary to modify the way teaching and learning is approached" (p. 47). The time for organization and implementation was upon us, so we began by doing what most closely resembled our prior normality but adapting it to virtuality. Thus, we began by giving the seminars using PowerPoint presentations with audio, which we uploaded to the virtual space that our school, fortunately, already had. As Aguilera-Ruiz, Manzano-León, Martínez-Moreno, Lozano-Segura, & Casiano (2017) refer, we agree that the recorded classes provided our students with a series of advantages, such as the possibility of visualizing the contents at their convenience and as needed.

At the same time, we asked ourselves several questions: How would we follow up with our students? How could the students apply what they had heard? And how could us, professors, evaluate what they had learned? Above all, what concerned us most was how to recognize the difficulties that the students encountered in order to help them overcome them.

After discussing and exchanging ideas about these questions among professors, our first activities emerged: problematic situations in which students should apply different cognitive levels, from the lowest level of knowledge, recalling information provided, to more complex cognitive levels such as comprehension, application, and analysis (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956). This problem-based learning strategy (PBL) proposed has proved to be a good way to favor the motivational and emotional components of learning, components in Hilgard's learning triad, together with cognition (Albanese & Mitchell, 1993; Hilgard, 1980).

On the other hand, considering that we are Immunology professors, we knew how to take advantage of this global health situation, adapting our classes and activities to the context. According to Maggio (2014) "Current events enter the classroom as potential and give us the opportunity to leverage on creation, which addresses temporariness to trigger an appetite for knowledge" (p. 69). In our case, on topics such as serum, monoclonal antibodies, and vaccines, we used current scientific papers and journalistic articles on the

COVID-19 treatments and vaccines under study as tools to foster discussion. In this way, we organized activities that complied with the dimensions proposed by Vallejo and Molina (2014) to be authentic evaluations, giving the students tasks that were meaningful and relevant for them as future professionals, which were real situations that were developing simultaneously with the course.

The flipped classroom is a teaching model that has been used for years, in which instructors explain the topics prior to the class, generally in the form of pre-recorded videos. This is usually followed by activities that students incorporate into the classroom work, ending with a discussion about the topics dealt with between instructor and students, given that the flipped classroom has always been thought of as a combination of online and face-to-face teaching strategies. This modality of work thus modifies traditional teaching consisting of expository, oral classes where the instructor only explains and the student listens in a face-to-face setting (Cheng, Ritzhaupt, & Antonenko, 2014; Espinosa, Solano Araujo, & Veit, 2018; Mok, 2014).

Before moving on, it is important to highlight the benefits of this type of teaching. Several studies indicate that the flipped classroom has a positive impact on student learning and that this impact is greater than that of the traditional classroom, since students show more interest and commitment, becoming the protagonists of their own learning (Aguilera-Ruiz *et al.*, 2017; Hernández-Silva & Tecpan, 2017). In addition, it allows learning at an individual pace and the topics are often dealt with in greater depth. However, these and other authors (Vidal, Rivera, Nolla, Morales, & Vialart, 2016) also emphasize that for the flipped classroom to be effective, it is crucial that the student has control over his or her own learning process, meaning that he or she is able to self-regulate it. At the same time, they also point out the need for instructors to ensure that students are acquiring on their own the prior knowledge necessary for a successful face-to-face class by using different tools, such as online questionnaires or reviewing the notes taken by their students during their self-study (Cheng *et al.*, 2014).

In our case, as previously mentioned, we chose to give the students activities to do and then hand

in for review and individual feedback.

The last element added to the virtual and mandatory classes was the synchronous sessions on Zoom. In a couple of weeks, all the ideas were discussed, and all the strategies were consolidated. In a sequential summary, with a different topic covered per calendar week, our students had to listen to the recorded seminar on the weekly topic and hand in the completed activity in writing, which they uploaded to the virtual space of the FFyB. Each of these exercises was reviewed by a pair of professors, one of the assistant professors, and the Practicum Supervisor (Jefe de Trabajos Prácticos, JTP), who was in charge of a group of 12 to 30 students according to the time distribution of classes (commissions). Each JTP in charge of a commission reviewed and gave feedback on all their students' assignments. The third element was the synchronous sessions, which closed each week's topic. These sessions varied according to the topic and the commission, but, in general, the assignments on which the students had previously worked were discussed, including presentations by the assistant professors, the JTPs, and sometimes by the students themselves.

Professors from Universidad de Barcelona point out the following:

The university professor is an innovative and creative higher-education professional, with a mastery of formative content and didactic strategies, capable of making students enthusiastic about learning: this would be the key to the teaching action at the university level according to de la Torre and Violant (2002, p. 22).

The same authors claim that the professor, as a professional, must comply with three aspects: 1) having sufficient mastery or knowledge on the subject matter; 2) acting in a didactic manner, since it is not only a matter of knowing the subject matter, but also of selecting it, sequencing it, and proposing pertinent activities; and 3) having the training and drive to grow professionally through self-training, critical reflection on their practice, and the implementation of innovation projects (de la Torre & Violant, 2002). During this pandemic, we used various innovative didactic strategies that allowed us to motivate and encourage our students.

Traditionally, games have been used for fun in leisure time, but more and more studies support the use of games as an ideal means of acquiring knowledge, as they provide stimulation, variety, interest, concentration, and motivation (Rubio & García, 2013). Game-based learning is the use of games as a tool to support learning, assimilation, or evaluation of knowledge.

In recent decades, scientific interest in games as learning tools has grown enormously, and although games are normally associated with childhood, they are also a good strategy to apply in higher education. Studies on this aspect at the university level highlight numerous advantages of using games, a strategy commonly referred to as class gamification, including a high level of student motivation and participation, as well as the ability to promote collaboration in the classroom and to develop cognitive thinking skills (Hierro, Atienza, & Pérez, 2014; Romero, Fajardo, Sánchez, & Beleño-Montagut, 2018).

Despite the benefits that game-based learning brings to those involved, this technique has been criticized due to the myth that learning and playing are antagonistic terms. However, one of the main positive aspects that support the implementation of games in education is the use of Information and Communication Technologies (ICT), which are one of the main drives for students (Hernández-Horta, Monroy-Reza, & Jiménez-García, 2018). The widespread use of electronic devices by students and the development of an adequate technological and communication infrastructure in various study centers had already opened a window of possibilities for the incorporation of new teaching strategies and techniques based on digital games at different formative levels. In the current educational context, where the entire course shifted to a virtual format, the usefulness of different platforms for educational games was brought to light. In our teaching practice, games such as educational ludic activities are included as formative evaluation strategies.

One of the topics covered during the Immunology course is the seminar on vaccines. In the section Vaccines from the Schedule, the strategy implemented consisted of the prior creation of infographics by the professors, using the platform *Genially*. Each of these infographics

contained information on different vaccines included in our country's National Vaccination Schedule (Argentinian Ministry of Health, 2020). The students received the link to access them a week before the synchronous session, having already listened to and completed the assignments and having had the synchronous session for the seminar on Vaccines Overview, which provided them with the basis for understanding the information in the infographics. Each one included a self-evaluation activity that could consist of a quiz or questions of different type to be completed on the platform H5P, which allows the creation and exchange of interactive content within the community free of charge, whether they are videos, presentations, or, in our case, questionnaires.

In the synchronous session, different activities were carried out for the sharing of information, such as the creation of a comparative table in which the most relevant aspects of each vaccine were included, interactive games (word roulette, crossword puzzles, target shooting), and role-playing games to discuss the anti-vaccine movements.

There are many platforms that can be adapted to practice or evaluate a given content; including *Kahoot!*, *Genially*, *Mentimeter*, *Educaplay* or *Quizizz*, among others. Returning to the experience previously described regarding our approach to the topic of vaccines from the schedule, the interactive games that were played during the synchronous session were previously designed by the professors writing this paper using some of the platforms mentioned, and the interesting thing is that each one implemented them in a different way. In some cases, the games were played by all the students at the same time, while in others, the students were split into different sessions using Zoom's breakout rooms, working with smaller groups, always accompanied by the professors.

In some classes, the games were played from the beginning and were the guiding thread, while in others, the infographics were first shared by the students through a comparative table of their making and then the games were played. The dynamics of this class allowed the students to feel they were the protagonists, generating a climate of trust and very active participation. The

use of this strategy fulfills many of the aspects necessary for feedback to have a formative value, according to Anijovich (as cited in Anijovich & González, 2011a), including generating a climate as pleasant as possible where mistakes are part of the learning process; offering opportunities for students and professors to identify strengths and weaknesses by using self-assessment strategies and completing activities together; providing examples with each infographic presented; and assessing positive aspects and structured conversation networks that provide feedback in a very short time. A very important aspect to highlight from the implementation of games was not only the possibility of exchange between students and professors, but also among the students themselves (peer-to-peer exchange).

Role-playing, also known as dramatization or dramatic play, is one of the active methods that can be used in teaching due to the proven effect that dramatization has on learning (Morales, 2006). In role-playing, participants assume an identity different from their own to face real or hypothetical problems in an informal but realistic manner.

In that regard, as mentioned in the previous paragraph, we brought this proposal to the synchronous sessions with our students to discuss a sensitive issue such as the stand taken by those who oppose vaccination, commonly called anti-vaccine movements, and issues related to our vaccination schedule in general.

Bearing in mind the purview of the future professionals to whom we teach the subject, we designed different scenarios in which they were faced with problematic situations, which they may eventually have to overcome during their career. These situations were based on two aspects: doubts everyday people have and anti-vaxxers' stand. The different roles were assigned to small groups of students and each question was given to them on the spot to discuss spontaneously, using all the knowledge previously acquired. This activity allowed us to demonstrate, in a hidden way, the knowledge that our students had acquired and that allowed them to successfully defend a certain position. In addition, we were able to verify vocabulary acquisition particular to our subject.

One of the objectives to be met by professors is to motivate our students, since motivation influences learning. With respect to student motivation, Polanco (2005) mentions that "a recommended strategy is to encourage students to become protagonists in the classroom and take ownership of knowledge, with a role that is not limited to listening and repeating the subject" (p. 10). In this sense, role-playing games are an interesting motivational strategy that challenges them to leave traditional passive learning behind and take on active learning, since these games require that students organize their ideas, using those considered to be fundamental in order to relate them to other situations, making learning meaningful.

Discussion

What did we learn from this compulsory 100% virtual teaching experience? It was a great learning experience in which we were able to identify that each of the three elements we used in the virtual, compulsory, and staggering teaching practice presented several limitations, but also several benefits, when compared to our routine face-to-face classes.

The recorded seminars were very favorable for the students, since they could access them at their convenience, and they could return to them as needed. The disadvantage that these seminars presented—because of the way we prepared them—is that many of them were too long. In an effort to include as much information as possible so they could complete the activities and taking into account that no hands-on practical work was to be done, the professors also included videos of laboratory techniques in their classes. As a result, the recorded seminars were too long. Although multiple studies have been published that link more study time to better academic performance (Gaeta & Cavazos, 2016; Núñez *et al.*, 2013), a successful learning process is more complex and depends both on personal factors as well as the teaching context itself (Dettmers, Trautwein, & Ludtke, 2009; Núñez, Vallejo, Rosário, Tuero, & Valle, 2014). In that regard, we believe that making

students dedicate more time to the subject given the length of the recorded material they had to watch was not beneficial to their learning process, but rather a limitation and shortcoming of our virtual teaching method. As will be mentioned later in the text, this longer study time that our students had to invest resulted in fatigue and, therefore, in a greater lack of attention to the recorded material, rather than in a better and more enriched learning process.

In relation to the written exercises that the students had to complete after watching the recorded seminars, it was very rewarding, both for them and for the professors. It is known that the problem-based learning strategy is an active and immersive process in which students must assume significant responsibility for their learning (Bate, Hommes, Duvivier, & Taylor, 2014). This allowed the students to work better on subject-specific vocabulary and to learn to express themselves properly, a skill that is sometimes overlooked due to the informal nature of orality. A point worth mentioning is the instrument we provide our students with as activities, understood as authentic tasks with content validity and meaning. To elaborate on these points, we considered the activities as authentic because they met the criteria of realism, relevance, ecological proximity, and identity highlighted by Vallejo and Molina (2014). As reported by Camilloni (1998), we were able to imprint these activities with content and meaning validity. Content validity aims to determine whether the questions of the instrument reflect the mastery of content to be measured, considering that the internal validity criteria include the quality of the content, curricular relevance, content coverage, cognitive complexity, linguistic adequacy, value or weighting to be given to each item, among others (Urrutia, Barrios, Gutiérrez, & Mayorga, 2014). In accordance with the above, our activities presented content validity since the different items of the activities were representative of the contents of the subject matter proposed each week, a representativeness that was achieved thanks to the expertise and knowledge of the teaching of our subject. Regarding meaning validity, we refer to the correlation we usually find between the results from these activities and the

subsequent performance of our students in the summative evaluations. This experience indicates that drill activities benefit students when they take summative evaluations that include similar instruments. To elaborate on the idea of this last point, and in accordance with what Camilloni (1998) reported, when mentioning meaning validity, we mean giving students problems that are not too difficult to solve and that could frustrate them, but neither too easy, nor that do not challenge them. Then, overcoming them is valuable for the student and poses a challenge that demands his or her best effort. However, and making an *a posteriori* analysis of our proposal, we recognize once again that the proposed activities were also, in some cases, extensive, leading to a significant investment of time and fatigue on the part of the students as well as on the part of the professors who reviewed each activity. Fatigue can lead to errors that are known as unintelligent mistakes, which are those linked to chance or distraction (Camilloni, 1994). This type of errors is difficult to anticipate, since they depend on numerous factors, both personal and unforeseen situations, including lack of sleep or fatigue, which can affect, for example, the student's attention when reading a statement.

With respect to the aforementioned review of the activities, of course, it was absolutely favorable for the students to have an individual written explanation of their answers, whether they were correct or incorrect. Considering that formative assessment is a process of continuous knowledge construction, a central part of this process is feedback. In this line, individual feedback offers students tools to improve their learning (Lima, 2017). therefore, it allowed students to take more advantage of the synchronous session, where they were able to bring up any doubts they still had so that each topic covered is as clear as possible by the time they are over.

For us, professors, it was also very good to be able to review each of the exercises of all our students before the synchronous session to have a more general overview of the common mistakes that arose from each topic, to not overlook them, and to address them in more depth. In our subject, there are several mistakes that we observe year after year, systematic mistakes caused by the

complexity of the content itself (Anijovich & González, 2011b), which are very interesting to bring out and work on. In this sense, and quoting Astolfi (1999):

the objective pursued [in dealing with mistakes] is to eradicate them in the students' work, but it is admitted that in order to achieve this, it is necessary to allow them—even to pursue them—if we want to deal with them better (p. 14).

To continue with our assessment of the individual review of the assignments, although we consider it a great advantage, we found it a very difficult task to carry out, which was not the only the course entailed, and which was very time consuming. We considered this feedback as one more teaching possibility for our students and we dedicated a lot of time to make it clear, so that the student received positive feedback on what he or she was doing well and non-critical corrections on what he or she was not. Often times, the corrections were not direct, but were rephrased as questions so that our students had the opportunity to engage in a discussion about the feedback. So much so that several students returned to ask us about these questions and were encouraged to reanalyze their responses. In agreement with Nicol's (2010) opinion about written feedback, we believe that it could only be used as an excellent strategy in our course because we worked with relatively small groups of students.

The last element we used in our temporal sequence was synchronous classes, our flipped classroom (Vidal *et al.*, 2016). Having covered the other two elements prior to the session allowed us to really see all the reported benefits of the flipped classroom without any disadvantages or limitations. We found it to be an extremely enriching and profitable experience, both for professors and students, together with the gamification strategies and implementation of interactive materials, as expressed in a survey that we conducted at the end of the course. Ninety-one percent of the students surveyed found the teaching proposal useful and dynamic, and 89% considered that the interactive material and the role-playing games helped them a lot to summarize all the information on vaccines from

the National Vaccination Schedule. It is worth noting that, of the total number of students enrolled in the subject, 70% of them (87 out of 124) responded to the survey.

It was more arduous to coordinate role-playing in a virtual context and to encourage students to speak than it usually is in a face-to-face class. Therefore, on several occasions we resorted to the cold-calling strategy to invite students to individually assume their pre-assigned group roles. Research confirms that voluntary participation in discussions increases with cold calling in the classrooms and is associated with higher learning outcomes (Dallimore, Hertenstein, & Platt, 2013). In our case, we were able to corroborate this research, but the strategy was only necessary at the beginning of the class for ice breaking purposes, since the students then successfully discussed the topics in a totally spontaneous and enthusiastic manner, engaging in organic and reflective discussions on the topics that were being covered.

No one doubts today that university teaching is undergoing a process of transformation and search for a new sense of knowledge, urged by the social context and the demand for quality. In that regard, our teaching experience during the pandemic was extremely enriching, a period of hard work, exhausting at times, but of enormous learning about another way of teaching. Pandemic allowed us to achieve a true flipped classroom, which we had been unsuccessfully pursuing for years. It allowed us to use ludic strategies that were unusual in our classes. We had continuous contact with our students that was closer than the one we had in previous years "face-to-face." We achieved a high level of recognition from the students regarding our course methodology, receiving extremely gratifying personal messages from them regarding the knowledge acquired, the strategies used, and our commitment and readiness to teach.

To answer the last question we posed in the introduction: How much will be left of the strategies used when we return to face-to-face teaching? We know that our teaching proposal has to be perfected in order to be used in face-to-face sessions, but we also know that everything we have experienced and learned during this

four-month virtual course is here to stay. We have discussed all the disadvantages and limitations we found in each strategy or resource used and highlighted their advantages and benefits. Our projection is to work on overcoming the difficulties identified as well as the limitations encountered, so that the next course we teach will be even better than the one we have just finished.

In conclusion, if we had to answer what the pandemic left us with, today we would answer: a unique teaching experience.

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