SOUTH FLORIDA
JOURNAL OF DEVELOPMENT

Experiences and actions of the Metropolitan Autonomous University during the Health Emergency in Mexico by COVID-19

Miguel Ángel Herrera Batista
PhD in Design, from Metropolitan Autonomous University
E-mail: mherrera@azc.uam.mx

Marco Antonio Marín Álvarez
PhD in Design, from Metropolitan Autonomous University
E-mail: marma@azc.uam.mx

Carlos Angulo Álvarez
Master in Design, from Metropolitan Autonomous University
E-mail: caa@azc.uam.mx

ABSTRACT
With the aim of addressing an immediate (and uncertain) future regarding, the Covid-19 sanitary crisis, a group of professors from the three design degrees (architecture, graphic design and industrial design) offered at the Metropolitan Autonomous University (MAU), decided to share experiences and reflections about the actions necessary to ensure a better way to deal to the health emergency and the resulting social estrangement. To this end, we used a strategy known as SWOT (Strengths, Weaknesses, Opportunities, and Threats) to analyze, assess and diagnose the experiences lived under the Emerging Remote Teaching Program (ERTP), a strategy that was undertaken by the University to continue its educational activities. Here we present the results of the analysis and our reflections.

Keywords: Remote teaching, technology and education, virtual education, SWOT.

1 INTRODUCTION

Due to the health emergency caused by Covid-19 and the necessary social distancing, educational institutions were faced with the imperative need to implement new strategies that would enable them to continue with their educational mission. Thus, the Metropolitan Autonomous University in Mexico City, launched a plan called *Emerging Remote Teaching Program* (ERTP). This strategy was applied amidst an environment of uncertainty and in the throes of recovery from what was the longest strike in its history. The adjustment of the school calendar resulted in a shorter trimester than usual (only nine weeks), which meant a greater challenge for teachers and students to cover all the contents of the school curriculum in an online teaching modality to which we were not accustomed.

The ERTP stated as a specific objective "To ensure the continuity of university education, as well as the submission of global and recovery assessments with the involvement of academics, to whom advice and technical support would be provided, without jeopardizing the university community's health in the context of the health emergency imposed by the COVID-19 pandemic" (Morales Franco, 2020: 3). The Project was based on "diverse initiatives in regard to the modernization of teaching at the university", with the aim of "developing proposals for educational innovation capable of being implemented at the university" (UAM, 2020: 1). In this way, professors and students proceeded to carry out the teaching activities mediated with the own technological equipment and internet infrastructure that each one of us had, in addition to the technological support that MAU offered, such as the Zoom platform, Moodle and Google resources.

In order to evaluate the experience lived during the first quarter under ERTP and, aware that the scenario would not change in the short term, the authors of this paper decided to analyze what happened in the light of the educational experience that this situation brought with it. To do so, we used a Strategic Planning tool known as SWOT, which is used to identify the Strengths, Weaknesses, Opportunities, and Threats of an institution, due we truly believe that this technique "facilitates free-form discussion and helps to identify key criteria and issues surrounding a problem or decision" (Information Resources Management Association, 2015: 1003). In this regard, Humphrey also thinks that SWOT is helpful to "identify for a company the internal strengths and weaknesses that are relevant in meeting external opportunities and threats, in particular situations" (in Mariani, Greggio, & Gino, 2017: 40), similarly Olsen agrees that SWOT allows "to build on your company's strengths; shore up the weaknesses; capitalize on the opportunities; and recognize the threats" (Olsen, 2007: 38). For Agarwal (2016) ""SWOT is a simple, structured and powerful analytical framework for problem-solving" (Aditi Agarwal, 2016: 32).

Our experiences with PEER supported by SWOT

2 STRENGTHS

The first step was to analyze our own strengths, i.e., to identify the internal factors that are particularly useful to achieve success in the challenge. According to Quincy et al., strengths "are aspects or characteristics of the business, or project teams that give it an advantage over others" (Quincy et al., 2012: 1). In the same sense Agarwal says that "Strengths are the internal factors that are favorable to an organization, program or project such as culture, expertise, experience, resources etc." (Aditi Agarwal, 2016:33) Strengths are, then, all those characteristics that constitute internal potentialities that enable us to address the challenges with a higher possibility of success. In this case, we may highlight the following.

2.1 CHALLENGES IN REMOTE DESIGN EDUCATION

One of the most important strengths we identified was, at the same time, one of the major challenges: the development of skills, attitudes, values, and the generation of knowledge that characterizes the discipline of design and that defines the graduate profile of our students; all this remotely.

As we know, within all the plans and programs of the Design degrees, there are very different kinds of contents. Some courses focused on theoretical issues, while some others are centered on practical issues and others more in theoretical-practical contents.

On the other hand, there are certain kinds of courses in which the learning experience needs to be really linked to the handling of tools or instruments and that find their reason d'être in the development of specific skills and knowledge. Similarly, are subjects such as descriptive geometry, drawing, graphic expression, etc.

2.2 LEARNING BY DOING: THE DIDACTICS OF DESIGN

Another essential characteristic in the design education is linked to the knowledge, skills, attitudes, and values inherent to design, which determines the students' graduation profile. The teaching of such knowledge and skills calls for specific didactic strategies. In this case, it is important to emphasize that some essential learning is achieved through the handling of equipment, instruments and tools, as we have said before. In this regard, the educational principle of "learning by doing" is essential, therefore, it is basically a matter of creating habits, which are a way of doing things, i.e., they are acquired from the principle of "learning by doing".

In addition to content related to the handling of tools and instruments, design education also focuses on the action of projecting and creativity, which are perhaps the characteristics that best distinguish our discipline.

Through the practice of designing, fundamental skills and characteristics of design are gradually developed. In this sense, once again, experience plays a central role in the development of these skills. That is to say, the continuous experience in the development of the design activity allows the student to establish fundamental connections in the exercise of design, such as the relationships between form and function or between structure and form.

Given the health contingency, teaching of contents focused on the principle of "learning by doing" presented an important challenge for the professors. In the case of project-based subjects, interaction through digital media was complicated, since in general, it took more time for professors to review their students' work and also hindered their collaborative participation, because in the modality of witnessing the exhibition of work and the collaborative opinion of all students is usually done in a group and public

manner. No doubt, we must still await a little more time before technological advances available to the whole higher education communities enable a better and easier interactive teaching of this kind of courses.

On the other side, in courses focused on learning the skills to handle and operate tools and equipment, the challenge was greater. In this instance, the ideal would be to have "simulators" that would allow students to acquire the necessary experience in this regard.

As an example, we can use one of the courses taught by Professor Marco Antonio Marín Álvarez in the 20-I quarter, in particular the one that corresponds to Technological V (Introduction to Audiovisual Media), in the fifth quarter of the bachelor's degree in Graphic Communication Design.

The subject is focused on the production of various audiovisual materials such as audio voice-over, slideshows, animation and video, for which it requires the use of specialized equipment that we have had for a long time for such purposes in the Metropolitan Autonomous University, however, due to the health emergency it was not possible to use them; therefore, it was necessary to use free software and plan some exercises in which the students could carry out, but they did not have enough quality due to the lack of adequate supplies. In this way, the professor of the subject agreed with the students that once the situation is back to normal, they would request the workshops corresponding to the subject so that they have the necessary experience in the handling of such equipment, which is considered essential.

Figure 1. Photosequence of the *Story Telling* by the students Flores Gómez Guillermo, López Pedraza Andrea Samara, Rasgado Pérez Hannia Alejandra and Vargas Morán Alison Carolina, carried out as a final work for the subject Introduction to the Media Audiovisuals.

2.3 DESIGN AND USE OF EDUCATIONAL MATERIALS

Another of the aspects discussed is related to the design and use of educational materials. As we have already pointed out, every discipline and every course focus on particular skills and knowledge. In this case, the subjects covered during the Pandemic were quite diverse, so the teaching materials were not the exception.

For example, in the course on Strength of Materials, given by Professor Miguel Angel Herrera to the students of architecture, we used video tutorials and specific exercises for each of the contents. The students' possibility of reviewing these materials not only allowed them to make up for sessions lost due to failures in the electric power supply or in the Internet network, but also strengthened the learning process in general. It is worth mentioning that the use of videos, along with the learning activities and the use of software, were part of a didactic strategy that is based on Piaget's theory about two principles called assimilation and accommodation. The experience in this regard was that the students highly valued these

Figure 2 Learning reinforcement process, applied by professor Miguel Ángel Herrera
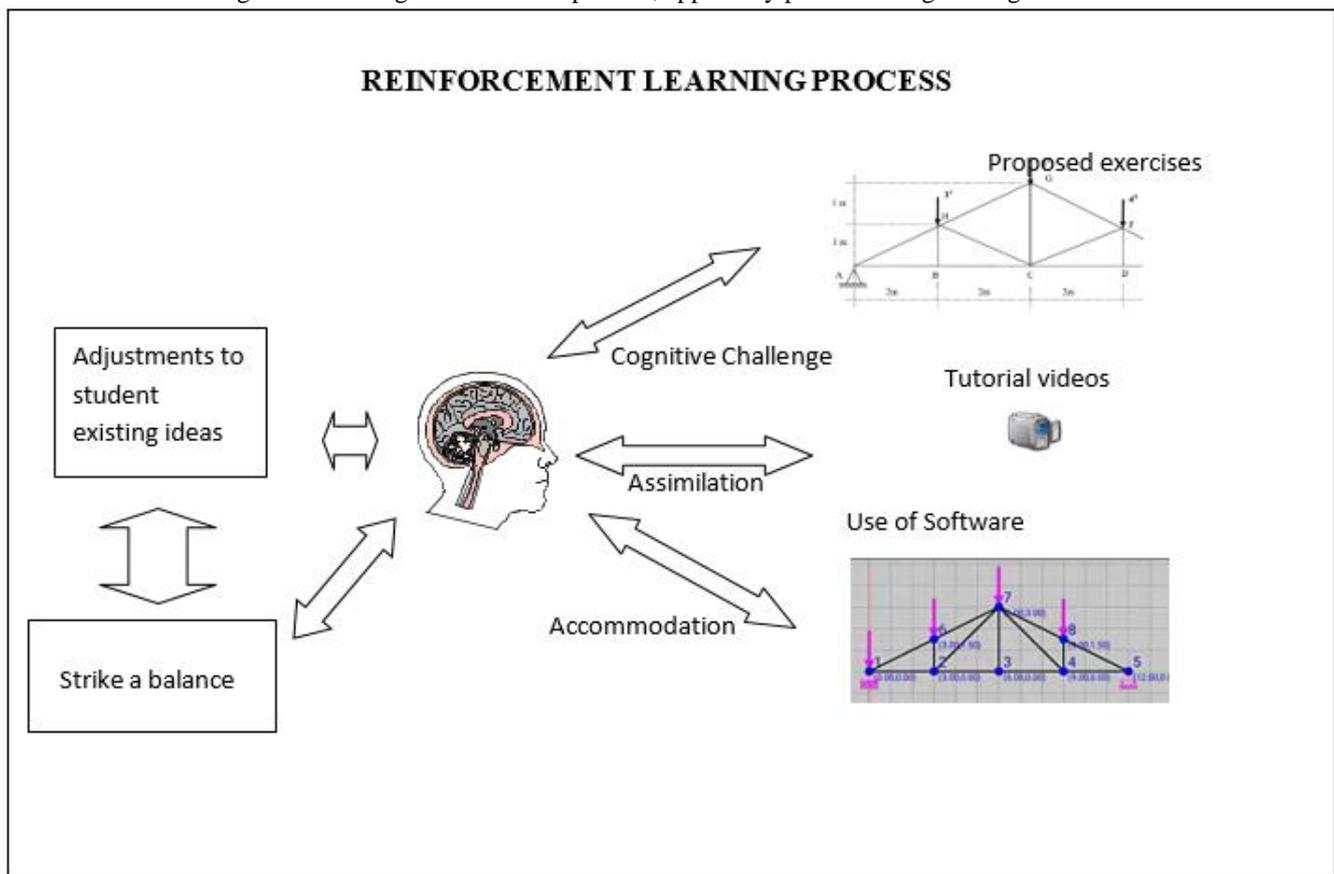
Another of the experiences gained was related to the course of Terminal Option Topics 1 of Industrial Design, given by Professor Carlos Angulo Álvarez, which aims to provide knowledge of 3D Computer Modelling. The followed strategy was, first of all, to have the most contact and communication with the students through *WhatsApp* and using a Virtual Classroom supported by Moodle, which is a well-known learning platform. An exercise to be performed was proposed in each session with the subject content. By means of a sketch with measurements and its visualization in isometric, this was provided at least one day before each class, likewise it was shown in real time and also a link was given which was binding to a screenshot file in video format, hosted on a personal *YouTube* channel.

Usually, teaching of design is strongly supported by laboratories and workshops. It is here that students did not have the opportunity to manipulate or operate equipment. Virtual simulators are needed, as they have been developed for the teaching of other degrees.

In general, and through this reflective analysis, we can affirm that the subjects taken in the learning of design are mostly of a demonstrative type, which forced us to use technological resorts. But it was also very important to understand that it was not about using technology as an unfounded resource, but rather that it should be applied with clear purposes for the development of each educational activity.

Figure 3. Video uploaded to YouTube for supporting the course Terminal Option I Topics: Introduction to Three-Dimensional Modelling, by Professor Carlos Angulo Alvarez
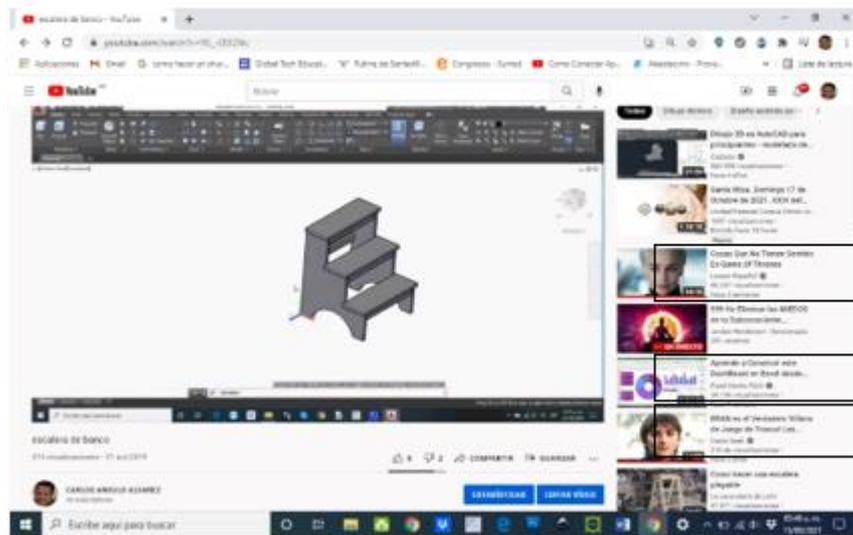
2.4 COLLABORATION AND SHARING KNOWLEDGE BETWEEN PROFESSORS

One more of the strengths that became evident was the sense of solidarity between fellow professors to provide support and sharing of knowledge and experiences. The COVID-19 has affected all of us in different ways without distinction, showing its most proactive side at all levels of society. However, in a number of areas it has shown the best of many of the participants, such as humanism, empathy, solidarity, respect for life and health.

2.5 UNDERSTANDING TOWARDS STUDENTS

Another important experience to highlight was the empathetic and flexible relationship with the students by the professors, given that conditions resulted in a shorter trimester compared to usual. Thus, professors devised strategies to make the best use of the time by trying to cover with enough clearness every one of the topics included in the syllabus. To this end, professors developed materials and design some strategies to progress at the rate that the situation allowed. Sometimes different didactic materials were designed to those normally used in face-to-face sessions, other time learning activities had to be

modified and materials had to be replaced by some others, and in certain cases it was even necessary to expand the virtual sessions (in accordance with the students' agreement). On the other hand, and in the face of failures in the electric power supply or Internet access in students' homes, the professors were open and flexible in the delivery and sending assignments and exams.

2.6 PUNCTUALITY

An important factor was the punctuality of the students in each virtual session. Due to the scheduling conditions of the distance classes, in general, there was a remarkable punctuality to start the online classes. It is to say that at the moment to start every class, most of the students were "connected". Undoubtedly, due they did not have to use transportation to go to school, they already were "on line". Another aspect that we could highlights was a proactive attitude on the part of the students in the face of this contingency.

On the other hand, professors were able to have time prior to the virtual sessions to do diagrams, tables, and drawings or any other type of information that could be useful during the session, something that in many occasions cannot be done in the face-to-face modality.

This aspect leads us to be clear that it is not a matter of inserting a face-to-face model in a remote model, but rather that each modality presents specific conditions. For example, the didactic materials to be used in a remote model should be thought out and developed in advance, since it will not be possible to use a material elaborated at the time of the class.

3 OPPORTUNITIES

Opportunities are conditions external to the institution that are potentially useful for achieving success, i.e., they are situations that are exploited to achieve the institution's objectives. Agarwal says that "opportunities are the external factors that are favorable for the organization, program or project". In the same sense, Olsen (Olsen, 2007) defines opportunities as "external influences or factors that have a more direct impact on an organization than on others". It is Olsen (Ibid) himself, who argues: "The success or failure of your organization depends not only on its internal capabilities and resources (strengths and weaknesses), but also on things that happen outside its control [opportunities and threats]".

In the case of design education, during this pandemic, there were external factors that had a major impact on the development of educational activities. Some of which are described below.

3.1 HOME SPACE SETUP FOR REMOTE TEACHING

The migration from the physical or real classroom to the virtual classroom required, of course, to set up a space "at home" to make use of computers, cell phones or other devices necessary to carry out

the learning activities. It is worth mentioning that in this context we could appreciate more than ever the facilities that we really have within the University but that we could not use during the pandemic.

Regarding the use of technological resources for the development of remote teaching activities, the great inequality that exists among our students became evident, because while some of them had adequate equipment and sufficient access to the internet, other students showed lack of appropriate equipment for remote connectivity, and limitations in bandwidth, so they used to connect through their cell phones, which leads to excessive consumption of data and therefore, to a higher economic expense. To all of the above, we must also add the lack of familiarity or skill in handling certain computer programs, which made this fact a clear problem of inequality.

In conclusion, the experience lived during this contingency leaves us a clear lesson: The great potential of remote teaching. Even though the University, professors, and students have been accustomed to face-to-face education, it is now time to promote and strengthen the mixed modality because each modality has its own characteristics that must be taken advantage of as a whole.

Lastly, we have also learned that we need to ensure access to free Internet in the homes of students or in easily accessible public areas, in addition to promoting the acquisition and provision of computer equipment for all students. This situation, more than an opportunity, is a big challenge.

4 WEAKNESSES

According to Agarwel "Weaknesses are the internal factors that are not favorable for the organization, program, or project and should be discussed openly" (2016: 34), and proposes to focus on questions like: What factors could be improved? In this regard, we identify the follow weaknesses.

4.1 VIRTUAL MODE: A PENDING DEBT

The Metropolitan Autonomous University (MAU), since its founding in 1974, has shown a commitment for educational innovation in Mexico, e.g., the quarterly model, the organization by Departments instead of by faculties or schools, the creation of a Division of Sciences and Arts for Design, as the so-called "fourth area of knowledge", and many others, constituted, at the time, true educational innovations in our country.

However, this health contingency showed us that we must strengthen the extracurricular modality, not only to attend to health, environmental or other emergencies, but also to increase enrollment and, above all, to fully comply with our own legislation. We can say that the extracurricular modality continues to be a pending debt at MAU and with it, we have been losing the possibility of facing with greater success the present and future challenges derived from health, environmental or any other type of contingencies that demand a distance teaching modality.

In this sense, the experience of the Emerging Remote Teaching Program (ERTP) clearly demonstrates the urgent necessity of strengthening the "extracurricular" modality in order to be better prepared for what will be a "new normal" in university teaching.

4.2 LACK OF ADEQUATE TECHNOLOGICAL INFRASTRUCTURE

This emergency health situation caused by Covid-19 revealed the lack of a general and adequate technological infrastructure within the reach of the entire academic community for distance education, because while for some professors and students the infrastructure and equipment they had were adequate, for others the situation was different. According to what we were able to observe, several students and professors had difficulties in carrying out their teaching activities on time. Unfortunately, we received reports of many students with this type of problem.

5 THREATS

Threats are external and internal factors that can have a significant negative impact on the performance of the activities and the achievement of the planned objectives. In this regard, Quincy et al. points out that "Threats are internal and external influencing factors in the environment that could cause trouble for the function or project"(2012:1)

5.1 TECHNOLOGY IS NOT ENOUGH TO ENSURE EFFECTIVE LEARNING

Although teaching involves different kinds of contents, most of them include learning in the cognitive domain. In this sense, learning does not happen by mere reception, but it is necessary for the student to process the information internally. Thus, from a constructivist point of view, the delivery of readings or other educational materials is not enough. It is essential that these activities be accompanied by cognitive actions that students must perform and that imply thinking skills such as associate, analyzing, comparing, explaining, applying, etc.

Based on this, in subjects related to mathematics and physics, for example, two kinds of didactic resources were used in addition to the real-time exposition and explanations: the design, production, and delivery of video tutorials and the development of problems that students had to solve as a key part of their educational activities.

While these strategies worked well for this type of course, it is clear that it is not valid for the development of every type of learning. As we know, in design education there are other types of knowledge besides cognitive ones. There are contents that can only be developed with the "learning by doing" approach.

However, in the face of all the challenges that students and teachers had to face, we must highlight the open and resolute disposition of the entire academic community in the pandemic situation, adjusting the times asynchronously to provide feedback, given that during these sessions not all the knowledge can be processed, but rather time is required to process and assimilate the information. Feedback was essential in this situation.

5.2 EYE CONTACT AND HUMAN INTERACTION

Although in general terms, we consider the ERTP experience to have been favorable, we must recognize those aspects that were lost in many cases. Among them are, of course, the impossibility of accessing design workshops and laboratories. Also, the lack of access to materials and printers that can only be found in specialized stationery stores.

A factor that in most cases affected the students was the lack of visual and physical contact, which is usually fundamental in the development of face-to-face classes in the development of face-to-face classes. We fully agree with what Andere Martínez points out "in spite of the benefits of the benefits of distance education, it does not match what was achieved and what will be achieved with face-to-face education" (Andrade Martínez, 2020:36)

5.3 LEARNING ASSESSMENT

Learning assessment was undoubtedly another major challenge. On subjects related to mathematics and physics, for example, the model of evaluating is still fundamentally based on face-to-face exams. In this regard, Cuellar et al. Identify the following levels of self-identification of students for learning exams:

a) Basic level: Access to virtual platforms via ID and custom passwords is personal and non-transferable information that de facto identifies students. Improper and fraudulent use of these identification keys can have legal consequences.

b) Average level: equivalent to an in-person evaluation. In a videoconference, they are asked to show the camera an identification card (code or other equivalent documents with the student's name, surname, identification number and photograph) before taking a test.

c) High level: biometric identity checks are carried out. It requires prior registration of students, installation on their equipment of complementary tools, and authorization to use the webcams and/or contents of the work desk. (Cuellar Rodríguez, Rincón Pardo, & Benítez Ramírez, 2021: 4489)

In our case, only students officially enrolled at the University had access to the courses. In some cases, professors required students to have their cameras, but for others this was seen as a way of violating

the privacy of the students' homes. Taking this type of evaluation of a distance learning setting, there is a big risk because the exchange of information in real time among the students is a great temptation. In this particular case, the experience has shown us an apparent increase in the average performance. The students obtained better grades in these subjects than the average in the face-to-face modality.

On the other hand, in the courses linked to the development of design projects, and given the lack of workshops and laboratories commonly used for teaching of design, professors had to be creative and flexible to provide advice to students and follow up on their own projects, which made it necessary to assist students even outside class time, in addition to dealing with the lack of tools and equipment to carry out the teaching in the best possible manner.

It is clear that such drastic change of educational conditions implied strong changes in other ways as well. One of those which generated the most debate was the question: to which extent can we trust the student; that is, to which extent can we be sure that the tasks, activities, and exams were done by the student him/herself with no help from anyone else or by impersonating someone else?

In this regard, we concluded that a shift in modality and conditions also demanded a change of paradigm in the trust that the teacher places in his or her students. This trust, however, cannot be totally open in all cases.

6 CONCLUSIONS

It is clear that the goal that Mexican society has given to the Metropolitan Autonomous University has reaffirmed the purpose for which it was created. In teaching, research and cultural dissemination, the pandemic made us look for new ways of working, and it made it clear to us that the most important thing was for our students to return to their educational activities in the best way that the situation allowed us. With a broad sense of responsibility, teachers, students and our University, we worked with ERTP, taking care of the health of all members of the community equally.

We must respect and enforce the mission, vision, and values that have distinguished MAU throughout its history, sparing no effort. New challenges exist and our responsibility is to adjust to them, preparing ourselves in the areas where we are lacking. Above all, we have the responsibility to make a diligent use of the technological means at our disposal, substantially changing our educational strategies in order to make them more efficient.

Social distancing and remote education should not mean a feeling of isolation for students. Nowadays, we must be closer than ever to our learners. We are well aware of the psychological effects of social isolation. This is why it is important to offer a warm welcome to students and colleagues.

This first experience related ERTP should be used to strengthen the basis of online teaching in the future, also involving students in their professional practices, and their social commitment, taking advantage of them in a continuous improvement. It is necessary to understand that the University is not just its facilities (laboratories, classrooms, library, etc.), but a strengthened community of administrators, academics and students, regardless of where each one of its members located.

The paradigm shift has shown professors how to be innovative. It is essential to continue to do so, to dare to modify ingrained habits or rigid styles of teaching. Face-to-face and distance teaching is here to stay, so the methodologies for teaching our classes must be attractive and innovative enough to captivate the student, in an integral way with simulators, didactic materials, collaborative work, services from the home office, personalized and asynchronous consulting. According to our experience in the context of the Covid-19, we can say, that "At the university level, the urgent transformation of classroom classes into an online format has been carried out in a way that can be described as generally acceptable, although the measures taken have been adapted with urgency and not with a well-considered, a priori plan to teach a subject with a completely online methodology" (Cuellar Rodríguez, Rincón Pardo, & Benítez Ramírez, 2021: 4480-4481).

The situation, we were going through, made clear to us that rigid teaching models are doomed to become obsolete. A cutting-edge university requires professors willing to continue their training in the required areas with the firm belief that they will offer the best in every scenario, in the face of every challenge. In this scenario, professors must be better at teaching the different topics. As Torres says, "Teaching is a complex process that requires teachers to organize their methodology, the materials they will use, in such a way that the contents are easy for students to understand so that there is construction of knowledge" (Torres Torres, Salavarria Barco, & Mera Velásquez, 2021: 3906).

REFERENCES

Aditi Agarwal. (2016). *An Expert Guide to Problem Solving. With Practical Examples*.

Andrade Martínez, E. (2020). Aprendizaje y educacióndurante y después de la pandemia global. *Revista Interdisciplinaria de Estudios Latinoamericanos*, *4*(2), 31–36.

Cuellar Rodríguez, L. Á., Rincón Pardo, M. A., & Benítez Ramírez, D. M. (2021). E-learning challenges for teaching content in environmental engineering within the framework of covid 19 an experience from the state and private university in Colombia. *South Florida Journal of Development*, *2*(3), 4480–4495.

Information Resources Management Association. (2015). *Curriculum Design and Classroom Management: Concepts, Methodologies, Tools, and Applications*. (Hardcover, Ed.). IGI Global.

Mariani, G., Greggio, F., & Gino, R. (2017). *M&A and Value Creation a Swot Analysis* (First). Torino TO, Italia: G Giappichelli Editore.

Morales Franco, E. (2020). Proyecto Emergente de Educación Remota: Informe Ejecutivo. Ciudad de México, México: Universidad Autónoma Metropolitana. Retrieved from https://www.uam.mx/educacionvirtual/uv/doc/peer/PEER-PROYECTO-EJECUTIVO.pdf

Olsen, E. (2007). *Strategic Planning For Dummies*. Indianapolis, IN: Wiley Publishing, Inc.

Quincy, R., Shuang, L., & Chien-Chung, H. (2012). *SWOT Analysis: Raising Capacity of Your Organization*. New Brunswick, NJ. Retrieved from http://www.csun.edu/~dn58412/IS531/SWOT (Rutgers University, 2012) .pdf

Torres Torres, N., Salavarria Barco, B., & Mera Velásquez, F. (2021). Didactic strategies to improve academic performance in higher education students. *South Florida Journal of Development*, *2*(3), 3905–3917.

UAM, U. A. M. (2020). Proyecto Emergente de Enseñanza Remota. Ciudad de México, México: Universidad Autónoma Metropolitana. Retrieved from http://sumawebdesarrollo.com/produccioneconomica/wp-content/uploads/2020/04/peer.pdf