

Effects and Consequences of Covid-19 to Higher Education in Mexico

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After more than six months of the COVID-19 pandemic some of its effects to higher education have been already documented. The higher education institutions around the world rushed to teach online, most of them without any preparation and in some cases in public universities their authorities imposing the technology to be used, the school calendar and new labor relations. At the Universidad Autónoma Metropolitana more than a third of the students considers that learning online has been minimum or null and 76.1% of their professors use their own equipment to teach online and 74.6% work more hours than the established in their contracts. At the Instituto Politécnico Nacional, 20% of its students did not take classes online and 10% of their professors did not teach online. In this paper some of the negative effects of COVID-19 to higher education are referred and discussed, among them, the effects on the salary inequality. Some recommendations are offered to the institutions in their return to “normal” activities.

Keywords: COVID-19, online education, inequality

INTRODUCTION

Many efforts are ongoing in the world to go back to fully in-person classes around the world. Although there are concerns about returning to classrooms knowing that not all the persons will be taking the recommendations to avoid contagion, because the contagious still remain high or because the schools are still not prepared to keep students, workers and teachers in a safe distance inside their installations. Some schools in some countries of the world which had started to have in-person classes like in the United States, Germany and France had to go back to online classes in some of their places because of sudden outbreaks among their students just weeks or even days after the renewed activities. In many countries there are hybrid teaching methods starting to be implemented with in-person classes and the rest online. However, some countries will have to wait indefinitely to have in-person classes until it is safe for professors, students and workers while they continue with online teaching.

Some of the effects of the covid-19 pandemic in higher education were foreseen (Dominguez-Perez & Dominguez-Vergara, 2020) and unfortunately have taken place. At the Mexican Universidad Autónoma Metropolitana (UAM) more than a third of the students consider that learning online has been minimum or null (UAM, 2020) and at the Instituto Politécnico Nacional (IPN), 20% of its students did not take classes online while 10% of their professors did not teach online (Instituto Politécnico Nacional, 2020). In this paper what some countries and specially Mexico are doing to handle the education crisis is reviewed, a

personal experience of teaching online is reported and the salary inequality at the UAM (Dominguez-Vergara, Ruiz-Salvatierra, & Dominguez-Perez, 2019) is revisited in order to detect some effects of the pandemic to the salary distribution.

EVERYBODY TRIES TO TEACH THEIR STUDENTS OR CHILDREN

The governments of different countries have designed new methods and teaching materials to teach in preschool, in primary and in secondary schools (Dominguez-Perez & Dominguez-Vergara, 2020). Some governments or schools are also providing computers, internet services or tablets to students. Unfortunately, in some small towns around the world there is no electricity, and the governments try to help their students in many ways; for example, providing them with printed school materials. In a district in India some teachers write on their schools' walls learning material to improve learning abilities of the students (Sharma, 2020). A lot of imagination and teaching innovations have emerged from teachers around the globe in order that their students learn and not be left behind.

In most parts of Mexico, lessons are given on public and private television channels (TV) for preschool, elementary and secondary levels. News reports show how families are making room for the children to watch their classes on TV at home. Although, some families have more than one child having to take classes and therefore must schedule very well the time to watch their classes on TV. Some poor families do not have televisions for their children to take classes, so they are being left behind. However, some people in some states of Mexico have donated televisions to some of those poor people. There are also children of people working in informal businesses on the Mexico City's streets taking classes with the cells of their parents while they work. Some parents try to help their children at the online school as much as they can and must "substitute" their schools' teachers despite that many of them are not qualified because they might not have finished primary school or secondary school. This extra job for parents according to many news reports has turned out to be exhausting. There are cases in which parents and children are learning some topics for the first time in their lives and others in which children must be teaching their parents instead. Some families have to change their TV viewing habits in order that the children take classes. It is still unknown how effective the TV classes are in teaching children because in Mexico for many years the TV set was the "idiot" box to watch and not the main tool to learn in this new learning method in which schools have been inserted into the dwellings of the students. So, nowadays extended schools consist of the students, the rooms of the students, the parents, the TV, and the far away teachers; or wherever places the students are to reach the indispensable internet signal.

In Mexico some small businesses provide students the internet signal in their premises for free. There are also families who reach plazas or coffee shops parking lots in order to catch the internet signal. Some teachers use their trucks to go to poor areas to teach some of their students carrying with them some teaching materials. Other teachers contact their students by phone when they do not have computers or TV at home in order to provide some instruction or guidance on the printed lessons materials. Some local authorities provide internet to students through trucks which travel to some locations. Some students are organized in small groups to learn together in front of a TV or a computer.

In the United States of America (US) as well as in Mexico some people hire tutors to teach or guide their children and sometimes, they associate with other parents to share costs, these micro schools allow their children to socialize, which is something greatly missing in online classes. Homeschooling is apparently growing in Mexico, at least for the time being (Gutierrez, 2020). Parents, teachers, students and other people have innovated the ways to teach and learn around the world. Notwithstanding all these efforts there are families in great need of jobs, food, medical care or other needs that impede that their children attend online or TV school lessons properly. There are also employers in the US that consider that their employees' problem in having online learning for their children is also their problem and hire tutors to teach their employees' children in their empty installations (Miller, 2020); maybe this effort could be tried by at least some universities all around the world with their employees and their children.

There is also a fraction of the teachers of all educational levels, like in Mexico, who are poor and are unable to buy a computer or to buy the services of a good internet provider or do not have a suitable space at home to teach online.

Some universities brag their successes in online teaching despite that it is clear that they have not been that successful, but most are very conservative about their successes. Some courses with laboratory or workshop practices cannot be appropriately taught online at least until now. It is clear that the most successful institutions have been those schools which had previous long experience in teaching online and also some private institutions that provided substantial resources to equip their institutions with appropriate tools and trained their professors in the use of online teaching tools too quickly.

HOW HIGHER EDUCATION INSTITUTIONS ARE COPING

The Universidad Nacional Autónoma de México (UNAM) reports that in the University City campus located in Mexico City there are 136221 students and that 33% of them do not have internet services, and 13047 have no internet service nor computer (Wong, 2020). In its Superior Studies Faculties located in the metropolitan area of Mexico City 37945 students have no internet, 39120 have no computer and 14225 have neither internet nor computer [8]. And of their 4615 students in its foreign campuses 1645 have no internet service (Wong, 2020). This data is for graduate and undergraduate students. The UNAM also has high schools and of its 111067 students in this level, 46346 have no internet (42%), 39120 have no computer (35%) and 22044 have no internet nor computer (20%) (Wong, 2020). This data reveals how difficult it is to study online in the most prestigious university of Mexico, which is a public federal university.

Old teachers form part of one of the most vulnerable groups to the pandemic and it is risky that they offer in-person classes because of the risk of being infected by students, administrative workers or other professors. The lack of professors may be a problem to go back to in-person classes when the situation improves.

In some countries like Mexico, private schools are suffering because a lot of people have lost their jobs and have no resources anymore to pay the tuition of their children. This will unfortunately lead to firing of teachers and other workers. Therefore, it is expected that public schools will increase their enrollment and become crowded for a few years; now that physical distancing is needed. In many countries of the world there are university towns with a lot of their people who used to work in a university and their businesses greatly depended on the students in services such as bars, restaurants, medical services, or businesses like bookstores (Watson, Hubler, Ivory, & Gebeloff, 2020). In a lot of private schools, the students must pay the same fee for tuition, which has triggered protests because some families claim that online teaching has been of lower quality. However, some universities admit that online teaching is more expensive because of the software, hardware, internet services, and many other technologies or services they have to pay in this new abrupt way of teaching (West, 2020).

For in-person classes, classrooms, cafeterias, aisles, entrances, and other places at schools must have better ventilation, barriers to separate students and other persons to avoid crowding. Schools should have sufficient restrooms in schools and water, soap and toilet paper in the restrooms. Students must be tested for coronavirus periodically and the schools must check students' temperature at entrance (Goldstein, Parshina-Kottas, & Aufrichtig, 2020). A lot of schools may not have the resources for those expenses. For the fiscal year 2021 the Mexican government has increased the budget for UNAM, IPN and UAM in 3.4 percent (an estimate of the inflation for next year), which is less than what it is needed if some improvements to school infrastructure, like better ventilation in classrooms must be implemented, in order to avoid contagion. That means that in those federal universities full in-person classes may take time to restart.

Concerns About Privacy and Intellectual Property Rights

There are also concerns about privacy of information which can be shared even inadvertently, by the companies which provide the services of video classes, and the schools must be attentive to attempts to violate student's or teacher's privacy. Some videos of classes could also start circulating not only by those providers of services but also by others who could hack them and sell them. This is possible in countries in

which penalties to piracy are not severe. It is possible that in the near future, some people may start collecting series of good courses and sell them on the streets of Mexico in CDs. In the future there is the possibility of having schools run just by a very few teachers and other workers or even with no teachers at all.

Future of Admission Procedures

In the midst of uncertainty due to the pandemic there have been admission processes to higher education institutions around the world. In the US most of the universities require the scores of the Scholastic Assessment Test (SAT) but some universities for this upcoming semester are not requiring these tests; this decision may forever change the way to evaluate students to determine if they are admitted to the universities (Bruni, 2020). Besides the SAT test there are other requirements to evaluate a potential prospect to be admitted. In many US schools they are starting to review the grades of the students in their high schools in order to determine students' admissions (Bruni, 2020). These new methods will give advantage to some students but not to all.

In Mexico, in the higher education institutions UNAM and IPN admissions is based only on one admission test. The test is presented by aspirants which have a grade point average of at least 7 (in a scale of 10) in high school. The required score in the test to be admitted depends on the career; that is, in the quota or space. In Mexico the coverage for higher education is of approximately 40% (Dominguez-Perez & Dominguez-Vergara, 2020). At UAM, students are admitted based on an admission test and on the grades they got in their high schools. Of course, in Mexico the educational levels in the many high schools of the country are very different.

During the pandemic, the UNAM carried out in-person tests for admissions. The UNAM had several days of testing the aspirants because enforced a healthy distance among them and also required aspirants to wear masks and transparent shields during the admission tests. At UNAM there were special days for testing persons who had been tested positive to the coronavirus. In the IPN there were also in-person admission tests which were carried out during several days. At UAM there was an online admission test. The Universidad Autónoma del Estado de México also carried out an admission test online.

During many years some researchers have denounced that the admissions tests to public institutions help rich people and are an obstacle for poor people to get a higher education. That is why in the Universidad Autónoma de la Ciudad de México (UACM) there is no admission test, there is only a lottery for admission and the students are admitted randomly. Likewise, in the Benito Juárez universities being created by the new federal government there are no admission tests and are located in highly marginalized places. In Mexico there are public as well as private higher education institutions which do not apply an admission test. In the future better ways to test students in pandemic situations will be found based on the experience of this year.

Artificial Intelligence for Future Education

Artificial intelligence will play a very strong role in the future in online education, in preparing personal teaching and testing material for students. However, so far, some tools have been disappointing like grading based on the socio-economic conditions of the students (Broussard, 2020).

Some of the things which we will see very soon is entire courses prepared by machines. The AI machines could take the material prepared by professors and improve it. They can invent the most typical, common, or gracious professor for each subject to teach, or the favorite actor or friend of the students to be the teacher. We will see many new things assembling AI, virtual reality and internet of things to improve education in the next few years. It should not be a surprise that in a few years a whole school be run by only one "smart" machine. This type of technology, while still far from any realistic usage today, may be a helpful tool for some cases but may also cause new problems to arise; both technological and social.

TEACHING ONLINE AT UAM, A PERSONAL EXPERIENCE

Some observations of one of the authors teaching online classes to UAM students in Mexico City are presented next.

The last trimester started on May 11 and ended on July 11 of the year 2020 (Dominguez-Perez & Dominguez-Vergara, 2020). The professor taught two courses online which in this paper are named A (with 26 students) and B (with 36 students). The professor used Zoom and email to communicate with the students.

In both courses the professor indicated to the students to turn off their microphones at will because in many places of Mexico there are a lot of noises as we explain next. In a lot of the streets of Mexico City trash collectors pick the garbage three times a day; workers walk several feet ahead of the trash trucks ringing a bell and then the people are alerted that they are there to pick up the garbage. People give bags with trash and tips to the workers who carry them in arms to the trash truck (the service is not mechanized). Also, during the day there is a truck selling 20- or 30-kilogram tanks of propane gas (LP gas) on the streets and shouting loudly that they are there for the people to buy that gas which is the fuel most people buy in Mexico for cooking. A couple of days during the week another truck passes by the streets of Mexico City, it is the car selling 20-liter bottles of water; the people in the car loudly shout that they are there, and the people shout back that they need to buy some bottles. There are also people who pass by the streets and clean the entrances of the drainage to avoid it gets clogged and ask for “cooperation” for their work. During the week the seller of *tamales* (corn in corn leaves) appears with a microphone announcing loudly *tamales oaxaqueños*, and again people interested in buying them go to the entrance of the buildings or houses where they live to buy some. Also, the high-pitched whistling out of the baked camotes (yams) cart is heard sometime during the day advertising that delicatessen. Sellers of doughnuts and biscuits also make presence on the streets sometime during the day announcing themselves with a child’s voice tape recorded message. People on a truck pass by the streets at least once a week and with powerful microphones announce through a tape-recorded message that buy iron made old appliances. Also, once a week an exchanger or trader of stuff loudly announces on the street that he or she is there to trade old clothes or other stuff for pieces of porcelain. In Mexico most people work in informal jobs, some of them on the streets singing or selling things. During the days of the pandemic there are people playing marimbas, trumpets or any other musical instruments and ring the bells or knock the doors of the dwellings asking for a little monetary help. The organ grinders also interrupt at least twice a week the possible silence that might be in the streets. In Mexico, a little more than 50% of the people is poor.

So, during the virtual classes when the microphones were turned on by the students many of those city noises were heard. In some instances, a rooster’s crow was heard or the quack of a chicken, which revealed that the students were probably in a rural or suburban area. Many UAM students live in places dozens of kilometers away of the university physical installations and during the pandemic many may have gone back with their families to some states of the Mexican republic. In other cases, some children or adults were heard in the background (maybe the student’s youngest siblings or parents). Barking dogs in the background while a student was talking in class was very common.

Because some of the students might not have felt comfortable asking questions amid these noises the professor kept his cell phone ready to read questions or comments sent by email or by the chat of zoom. The professor incentivized the students’ participation during classes. The professor never muted students but they did it by themselves. Before starting the courses, the professor suggested the students not to use video during classes because probably some students did not have proper space to study, were living in a very crowded space or for any other reason. At least for a very few exceptions cameras were always turned off. Most of the students turned off their microphones. Despite the suggestion two or three students turned on their video cameras for a short time. The ones who turned on the cameras in the course A were seen in a suitable space and they had desktop computers, desk and headphones. The students were very polite, respectful and attentive during classes which is the typical Mexican university students’ behavior; because of this it was unnecessary to impose a strict discipline during the online classes.

At class only a very few outgoing students interacted with the professor who often asked if there were doubts or comments. Some of the students seemed to log off and log in intermittently, but they explained that their internet service did not work well. In the course A the professor emailed to the students notes of the class before every class started. The students found those notes to be very useful and clarifying. In the course B, some of the students asked the professor to reduce the requirements to get a good grade because it was an online course and because the number of weeks of the trimester was reduced (Dominguez-Perez & Dominguez-Vergara, 2020), the professor rejected the petition. The shortage of the trimester (Dominguez-Perez & Dominguez-Vergara, 2020) caused that many professors reduced the number of topics taught which will cause gaps in the formation of the students. This reduction of the duration of the trimester by the UAM authorities has damaged the formation of the students at some extent.

The use of email was very useful. In the course B, the professor sent the tests by email and gave sufficient time to be received by the students, sufficient time to be solved and sufficient time to be scanned and sent back to the professor by email. A very few students claimed that the first test was not received on time and asked that the next tests were sent to them an hour before and that they were allowed to send back the answers an hour after the deadline, this was not acceptable because all the others were in equal circumstances. At the beginning of the course B, the professor established that the students had 4 opportunities to pass the only test of the course. In course B, at the end of the trimester there were only 22 students presenting the test and the professor in order to avoid that the students copied elaborated a different test for each student each of the four times. The first time only one of the students kept his grade and the rest tried to improve their grades in the following trials. It was difficult for the students to copy because the tests were different.

The professor had to work more than in a normal course preparing the tests, watching that the students returned their tests on time, replying to students' questions and grading the tests. A lot of professors dedicated more time to online courses than what they did in normal courses (UAM, 2020), also the majority of the professors gained weight (UAM, 2020). In the course A the professor allowed plenty of time to solve the two programmed tests of the course, but copying was highly penalized.

In the course B the professor used a blackboard to explain the doubts the students had on how to solve mathematical problems. In the present trimester, which started on August 31 of 2020, the professor is using a blackboard in front of the camera of the computer for the two classes (with 30 students in one course and 52 students in the other), besides of providing the students with notes in one of the courses. This is working much better because the students feel familiar with the method; they see the professor standing in front of the camera and solving on the blackboard some mathematical problems the students pose; the professor is not just a face on the screen which could be easily replaced by a photograph.

EFFECTS OF COVID-19 TO SALARY INEQUALITY AT UAM

The salaries of the employees of the UAM during the last four semesters were analyzed to try to detect any impact of the coronavirus to the salaries. The semesters studied were the second semester of the year 2018, the first semester of the year 2019, the second semester of the year 2019 and the first semester of the year 2020. The first semester of 2020 ended on June 30 of 2020. All the data used for the analysis is public (Gobierno de Mexico, 2020). At UAM there are 3 sectors of employees (Dominguez-Perez & Dominguez-Vergara, 2020), the professors, the functionaries (or employees of confidence) and the workers (which are the administrative workers plus the rest of the employees that are not professors nor functionaries like the academic technicians).

A very complete analysis of the salaries for the second semester of 2018 has been reported in a previous work (Dominguez-Vergara, Ruiz-Salvatierra, & Dominguez-Perez, 2019). In that work it was found that there was a great salary inequality because there were 85 employees earning more than the Mexican President (more than \$108656 pesos); in fact, there were 34 employees who made much more than the Mexican President (more than \$138000 pesos). In 2018 the Mexican peso's exchange rate was 19.5 per US dollar (Dominguez-Perez & Dominguez-Vergara, 2020). Due to the pandemic the peso has devaluated and on September 23, 2020 the rate was \$21.6 pesos per dollar. The former study was carried out during the

UAM's longest syndicate's strike (from February 2, 2020 to May 6, 2020) and because of the huge salaries of many of the functionaries, these were called the "golden bureaucracy". During the strike negotiations the UAM's syndicate asked the authorities to better distribute the federal salary budget because it was unequal and discriminatory because the median of the salaries of the workers was of \$7506.95 pesos, which was not enough even to buy the basic food basket. During the sessions of the negotiations during the strike, the UAM authorities promised to try to increase the workers' salaries as soon as they could. In this work we found the advances that the authorities have made in their promise.

During the 2019 strike of the UAM's syndicate, the administrative workers also complained that the work of a lot of functionaries could be carried out by them and therefore the authorities were stealing administrative workers' matter of work. They also pointed out that, in the cases in which was applicable, a functionary earned much more for the same work. The workers complained that despite that the proportion of the functionaries was less than the one of the workers, the proportion of salaries of the functionaries was much larger.

It has been found that the number of employees who had net monthly salaries larger than \$108656 pesos were 85 in the first second semester of 2018, 167 in the first semester of 2019, 170 in the second semester of 2019 and 100 in the first semester of 2020. The number of employees who had net monthly salaries larger than \$138000 pesos were 34 in the second semester of 2018, 44 in the first semester of 2019, 73 in the second semester of 2019 and 19 in the first semester of 2020. That is, the number of employees with very large salaries increased during the year of 2019 and decreased in the first semester of 2020; but the number of employees making more than \$108656 pesos is larger in the last three semesters than in the second semester of 2018.

In the current federal administration, there was a mandate that no one could earn more than the Mexican President and it was thought that the number of persons at UAM with very large salaries would diminish after the year of 2018. From the data it was found that the largest net monthly salary in the second semester of 2018 was of \$251287.36 pesos, the largest net monthly salary in the first semester of 2019 was of \$356089.96 pesos, the largest net monthly salary in the second semester of 2019 was of \$419510.09 pesos and the largest net monthly salary in the first semester of 2020 was of \$238260.96 pesos. These results show that during the year of 2019 the largest salaries paid by the UAM were very high. The largest salary in the first semester of 2020 is comparable with the largest salary in the second semester of 2018.

To compare the largest salaries of the employees with the rest of the employees it is reported that the median of the net monthly salaries of all the employees was of \$11963.36 pesos in the second semester of 2018, \$12885.56 pesos in the first semester of 2019, \$12539.18 pesos in the second semester of 2019 and \$11389.88 pesos in the first semester of 2020. The median of the net monthly salaries of the workers was of \$7506.95 pesos in the second semester of 2018, \$7469.50 pesos in the first semester of 2019, \$8023.28 pesos in the second semester of 2019 and \$7077.58 pesos in the first semester of 2020. The median of the net monthly salaries of the workers decreased from the second semester of 2018 to the first semester of 2020 in 5.7%, and that median decreased from the second semester of 2019 to the first semester of 2020 in 11.79%. These results show that the UAM generates salary inequality and discrimination and that the promise of the authorities during the negotiations of the 2019 strike at UAM was empty. The pandemic brought negative effects to the salaries of the workers.

Fig. 1 shows the numbers of employees by sector. The numbers of employees changed little during the last four semesters analyzed, and from the second semester of 2019 to the first semester of 2020 there is a little decrement in the three sectors. The largest decrement was for the professors with 34; maybe because authorities froze the hiring of temporary professors.

FIGURE 1
NUMBER OF EMPLOYEES AT UAM DURING THE LAST 4 SEMESTERS

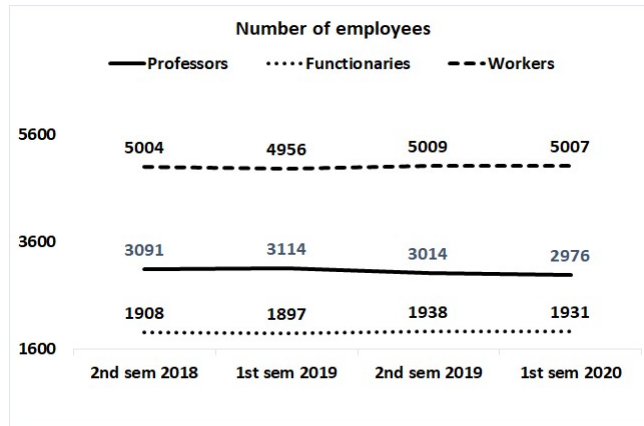
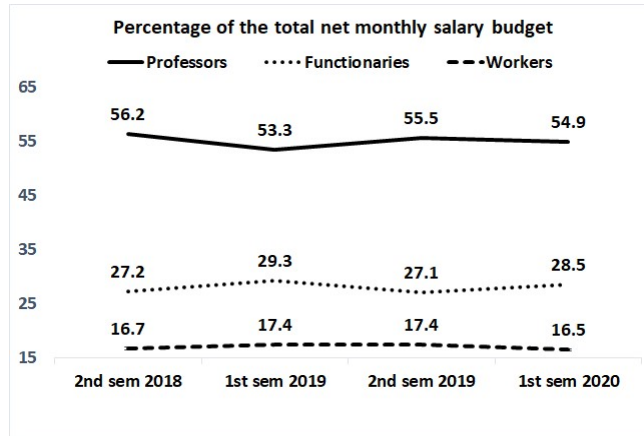


Fig. 2 shows the rounded percentage of the total amount of the net monthly salaries for the three sectors. In comparing those percentages of the second semester of 2019 and the ones for the first semester of 2020 it was found that the percentage of the salaries for the professors decreased 0.6% and the percentage of the salaries for workers decreased by 0.9%; however, the percentage of the salaries for the functionaries increased in 1.4%. It is unknown how during the pandemic that increment in the salaries for the functionaries was authorized; many decisions might have been taken by the authorities without properly consulting with the UAM community with the pretext of the pandemic; it may possibly be known only until the pandemic is over how those decisions were taken.

FIGURE 2
PERCENTAGE OF THE TOTAL NET MONTHLY SALARY BUDGET FOR THE DIFFERENT EMPLOYEES AT UAM DURING THE LAST 4 SEMESTERS



Also, the total amount paid by the UAM for net monthly salaries was of \$259882340.58 pesos in the second semester of 2018, \$245395465.17 pesos in the first semester of 2019, \$269226267.81 pesos in the second semester of 2019 and \$250045948.09 pesos in the first semester of 2020. Thus, from the results of the largest net monthly salaries, the number of employees who made more than \$108656 pesos and the information in Fig. 1 and in Fig. 2, it is possible to conclude that authorities are not distributing some of their high salaries to the administrative workers.

A deeper analysis of the salaries during the pandemic will be carried out in a future paper.

SOME RECOMMENDATIONS FOR ONLINE COURSES

It is recommended that the teachers videotape their lessons in order for the students to review the classes at any time because probably at home the computers, cell phones, and other devices are being used by their siblings, there is noise at their home or because their places are crowded at the time of the classes. This will allow a lot of flexibility to the student to be asynchronous.

The professors should investigate how professors at their school, country and other countries teach in order to get ideas to try for themselves. There are a lot of teachers striving to teach students in different places and under very different and difficult situations. Also, there are many courses providing tips on how to use tools to handle educational materials. The professors should improve their courses considering the problems they had in the previous semester/trimester. Professors should ask suggestions from students on how to improve.

In some parts of the world professors should allow students to omit the use of video and the microphone. And that the students can ask doubts during the class by using the chat in the tool of the video class or by email. Professors should consider elaborating notes of the courses. This is very helpful mainly if the students could not access digital textbooks. The professor should focus on the important concepts to be learned by the students and in answering questions and clarifying doubts. Also, the teachers should try to contact those students who do not connect any more to the courses or connect little in order to find out if they need help that the schools could provide. Teachers should also keep thinking about how future universities could be and in new methods of teaching in a future world. Likewise, teachers should prospect about potential problems in the future, like climate change disasters or the impact of an asteroid, a world without universities and probably without internet. All this is improbable but possible.

There are many recommendations for students to get the most of online courses like finding a comfortable place to study at home. Something that should be tried is how to socialize in the new situation. Previous to the pandemic small groups of students were naturally formed (“little balls” are called in some places of Mexico) who took the same classes, ate together and studied together; the challenge now is how to recreate some of those groups at online schools; that is, how to find new ways to socialize. A possible hint at a solution to this is the way these small groups openly communicate in groups in chat applications such as WhatsApp, Messenger, Telegram and Discord. There could be a possibility in creating learning material that is easy to share through images in the same way students have taken photos of their own notes to share to their classmates. The professor may also give an amount of time for students to take screenshots of what the professor has written.

In the countries in which schools are being opened despite that contagions continue; the governments should provide enough resources in order that all the students be tested to coronavirus periodically and that the ones who are contagious are safely treated; besides providing funding to adequate the schools’ infrastructure until effective and safe vaccines against the coronavirus are available.

CONCLUSIONS

It is obvious that in-person education is by far, superior to online education, at least in a lot of careers. Online education is still work in progress. By now, in-person teachers are better than machines and are indispensable in many educational levels, in accompanying students and parents. Teachers provide emotional support that students need. Teachers provide support that machines cannot give, for the time being. Teachers should continuously improve their classes and should investigate how other teachers are faring in trying to teach students who cannot greet physically. For some it is an odyssey to teach online, but most teachers are taking the challenge joyfully despite that some do not receive the necessary resources from their authorities. In the middle of the pandemic, the world is changing by trial and error in education, because teachers in the different countries strive in different ways, according to their resources, to reach the unbreakable objective of educating their youth.

It will be until the pandemic is over to account the full damage of the pandemic to the education of people in the world but so far many have been left behind and due to that, inequality will grow in the world

mainly in developing countries. The damage will last many years and for many people there will not be remedy. Some countries will suffer for the lack of competences of their young people and some youngsters will lose the opportunity to climb the social and economic ladder that higher education might provide. In this crisis the normality for university students is to be logged in instead of being physically somewhere in a university. In many nations in the future in the event of fires, hurricanes, flooding or earthquakes it will be very common to suddenly switch from in-person to online education. One of the greatest advantages of virtual education is that “the schools” can be easily taken to other places and in some cases “fit” in a laptop. Sadly, in the future workers’ strikes in higher education institutions might be easily broken by virtual classes given by machines, which could become the new strikebreakers.

It seems that the functionaries of the UAM have distributed the salary budget only among themselves because the percentage of their net monthly salaries increased from the second semester of 2019 to the first semester of 2020. They do not realize that a little distribution of their high salaries to the workers could be a great relief for these people. From the data is clear that what they receive is not even distributed to adequate the infrastructure to prevent contagious when in-person classes start sometime in the near future.

The pandemic disabled the proven educational systems of most countries; proven for pre-pandemic conditions. There must be a reconstruction, revolution or evolution of the previous educational systems from the lessons learned during the pandemic.

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