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Diego Ignacio Bugeda Bernal*

Great Expectations
The Paradoxes of Virtuality
In the Time of a Pandemic

Though it might seem paradoxical, the COVID-19 pandemic has made us more present than ever in the materiality of the virtual. The digital world already existed before the health emergency, but undoubtedly, its consequences, confinement and the "new normal" among them, sped up that world's development and also made its advantages and disadvantages more visible. We talk to three UNAM experts in information and communication technologies (ICTs) about virtuality, including among other issues, working from home, online classes, distance learning, and streaming. Esmeralda Martínez, Samuel Martínez, and Miriam Olguín all work at the Center for Research on North America and from there have

contributed with their initiatives regarding the good functioning of the forms and methods that Latin America's largest university has developed in the unexpected circumstances currently being universally experienced. They tell us in this interview about their experiences and explain their conceptions of this new "virtual reality."

Diego Ignacio Bugeda (DIB): The lockdowns caused by the COVID-19 pandemic have been the main factor in what may be a radical change in our expectations as people somehow thrown into a new, unknown world that we never wished for, what has been called "the new normal." The so-called ICTs, and, in general, the entire phenomenon commonly known as "virtuality," play a fundamental role in the creation and consolidation of expectations. For that reason, as experts, what do you think of this

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overwhelming transformation in human practices that this new way of life has brought about? Why don't you start, Samuel?

Samuel Martínez (SM): Well, based on what you just said, I think it's important to look at two themes of what's called "virtuality": the exponential rise in information sources and, with that, the emergence of an infodemic and the massive increase in the offering of online services. Broadly speaking, we can analyze this phenomenon in two parts: on the one hand, live transmissions, many of them on demand, in what's been called streaming, which has undergone very rapid, high-impact changes. We've moved from transmitting through video-conferences held in special rooms, with very sophisticated, expensive equipment, to a model of collective communication via computer. Today this is handled mostly through Internet, on platforms and apps that are relatively easy for any user to access and that allow us more independent, flexible, efficient forms of communication, like Zoom, GoogleMeet, or, for educational purposes, Classroom, among the best known.

The second part of this phenomenon is the proliferation of resources, platforms, and software that have emerged to facilitate people's communication and access to information. Undoubtedly, this has decidedly contributed to consolidating the idea of working from home. Of course, platforms like BlueJeans, Zoom, and Skype already existed, but the circumstances that the pandemic created, that of staying and working from home, drove their development and optimized their possibilities. With the pandemic, in fact, a significant number of new platforms and online possibilities for communication emerged, all housed in the cloud. Some of them are very potent and sophisticated, like Jitsi Meet or Microsoft Teams —also very useful in fields like education— and have helped create the expectation that working from home is here to stay.

DIB: A related question, Samuel, about all these technological tools: Do you think that these times of pandemic have accelerated their development *vis-à-vis* how they were advancing before?

SM: Yes, of course, I'm convinced of it. For example, take the case of Teams, a videoconference platform that I've worked with a lot in the last year and a half. I'm very im-

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pressed with how it has been updated in very few months; it really changed a lot: they optimized resources for visualization; they introduced innovations to make the sessions more dynamic, etc. And that's just one example, because the majority of the other apps and programs did the same thing, including platforms designed for transmitting and picking up video and audio from other sources. Naturally, this has had a significant impact on technology users, who have had to adapt. I'm sure that many people expected the lockdowns not to last as long as they have. I read somewhere that we've advanced about ten years in the field of digital technology. This of course also brings about a change in the culture of the workplace and in people's ability to adapt. Some software programs have gone through three or four versions this year.

DIB: To establish a little bit of context, Miriam, to understand these changes better, I'd like you to look at the basics and ask you what virtuality is. What are its advantages and disadvantages in the context of the pandemic?

Miriam Olguín (MO): Well, I think that we can define virtuality as the ability to carry out different activities through technology in different contexts without needing to do them in person. What we are experiencing today undoubtedly means an astonishing transformation of the ways we live our daily lives.

Of course, the virtual mode has brought a lot of advantages and disadvantages in all areas of our lives: on the social, political, and economic levels, and, outstandingly, in the field of education, there have been many changes. The same thing has happened regarding the workplace.

I'll look at the advantages first: virtuality offers us opportunities for improving our skills, not necessarily our competencies. For those of us who work on developing ITCs, it's been a challenge, because we've had to incorporate and train everyone in our workplaces, so that

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they, too, can improve their competencies and technological skills. In addition, this virtual mode has allowed us to innovate in different contexts. In the cultural sphere, for example, today we can have access to places we couldn't have imagined before, like museums. There have also been innovations in the field of work: working online has brought many advantages. Among others, people say that working from home makes for greater productivity. Why? Among other reasons because we save a lot of time used before in transportation: a lot of people took, for example, over two hours to get to work. Also, in a way, working from home has helped us communicate better; this can be seen in social interrelations and, of course, also, in education, where we can see multiple advantages.

For those of us who work in technology, virtuality has also broadened our job opportunities: for software developers, specialists in data mining, in artificial intelligence, in semantic web, in preparing virtual environments, for example, virtual reality, augmented reality. In education it has also brought many benefits, as can be seen with the huge number of online offerings for training and updating. Many of these are from very prestigious institutions and universities, like the UNAM, which have opened up distance-learning for-credit courses. It has also allowed for the creation and improvement of educational platforms, which have increasingly adapted to each individual's educational needs. That is, they have centered on the student, offering him or her more flexible educational resources than just classes.

Now, let's talk about the disadvantages. Regarding work, for example, working hours have gotten longer, which brings us face to face with the need to move ahead with a form of organization that would guarantee established working hours can be fulfilled. With regard to education, in 2005 an important author, Kemly Camacho, had already mentioned that the introduction of new technologies al-

ways brings with it inequalities in opportunities for development among those who have access to them or don't. That is, technological innovation inevitably means the creation of and/or the deepening of digital gaps. In education, with the swift technological transition brought about by the pandemic, many institutions in the sector, many schools, were nowhere near prepared enough to successfully make the changes. They didn't have —and many still don't— the tools required to connect, or the skills or competencies they needed. All this widened the digital gaps.

In the field of education, another obstacle is that teachers have tried to make the traditional virtual. In this new reality, we must be very clear that the new ways of giving classes are very different; it is not a good idea to give them as though we were still in a face-to-face situation. The teaching-learning model that supposed the traditional way of professors imparting knowledge to students has been surpassed. Today, that model is no longer functional and will have to give way to an education centered on the individual needs of each student, an objective to which technology can tribute enormously. To do this, innovation is undoubtedly required in educational processes and curricula, above all in public education. To that end, both institutions and teachers will have to be digitally trained, of course, in the use of new technologies, but also to be able to design educational strategies that can adapt to current models. In fact, in certain educational spaces, like higher education, we'll probably never return completely to in-person teaching.

DIB: Miriam, all these technological advances have been developed due to the need for communication and distance-education and work. So, have they contributed to increasing the digital divide? What does the future hold for us regarding technology and communications?

MO: I can say about this that most studies look at the digital divide in terms of access to technologies, the availability of Internet connectivity, the use of specialized infrastructure, and mobile devices. Other studies also mention other kinds of gaps, such as the use and appropriation gaps, both related to access to knowledge.

Really, the new virtuality and the pandemic had the effect of underlining the digital gaps. According to Mexico's National Institute of Statistics and Geography, in our country, 73 percent of people in urban areas have Inter-

WORKSHOP ON UNAM
STREAMING CHALLENGES AND OPPORTUNITIES

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A few months before the decision was made to move UNAM academic and outreach services to a virtual environment, a workshop was organized about the best streaming practices. Later, lockdown strengthened it and the workshop has received greater recognition, even beyond academia strictly speaking, to the point that the university's current rector, Enrique Graue Wiechers, decided to support and institutionalize it. Its mission was and still is to construct and maintain a space for analysis, discussion, and the generation of proposals. It also has the aim of creating a network of experts in new technologies from the different university bodies to exchange ideas, information, and propose initiatives to optimize streaming. It focuses above all on the tasks of digital transmission of live events or on the language of the digital media in real time, such as seminars, colloquia, congresses, roundtable discussions, online courses, etc.

Two of the workshop's main creators and promoters, Esmeralda Martínez and Samuel Martínez, from the CISAN Systems Department, tell us about their experience and motivations. They still enthusiastically contribute to keeping this workshop alive, with its periodic sessions . . . naturally, at a distance.

Esmeralda Martínez

✓ "The workshop's objective is to share each of its member's experiences about how to improve live transmissions of university events. And even more now that, due to the pandemic, we have to continually update. The workshop members share that knowledge. We meet and report to each other about all our advances. For example, if we find new software or develop a protocol that helps optimize some of the streaming processes. Every member contributes ideas and suggests initiatives to optimize university streaming in different aspects: reducing production time, improving the quality of audio and video recordings in real time, minimizing costs as much as possible, etc."

✔ "The idea of organizing a series of roundtables called 'COVID-19: Reflections from the UNAM' also came out of the workshop. In these roundtables, different experts delved into topics like health, economics, education, the humanities, society, the planet, sports, etc., and what ties them all together is how all these areas were affected by the pandemic. All the contributions and the feedback from the audience were transmitted in real time. It was very stimulating because, in addition to being a success in terms of audience size, the experience was a kind of pilot test of everything we've been discovering and innovating in the workshop."

✔ "The streaming workshop is part of a more ambitious project that the rector's office assigned to the General Office for Information and Communications Technologies, which consists of creating a repository containing the recordings and transmissions of all the UNAM's academic events on an easy-access platform that would have a user-friendly interface for the general public. In short, the goal is to create something like a university YouTube. This is a very ambitious project because it involves many complex technical issues, from the storage of information in servers to the cataloguing and classification of an enormous amount of digital material. The two-year experience we have already had in the streaming workshop lets us make valuable contributions to this huge effort."

Samuel Martínez

✔ "In the workshop, we began to realize that what we generated as video-on-demand, or streaming, is no longer just for students' consumption, but for the community in general. We understood that it's very important to disseminate what the UNAM is doing, and, in the case of Esmeralda and myself, what the CISAN is doing, in the areas of academic dissemination, continuous education, and online education. We do this with tools like Moodle or Classroom, which aren't worked on independently; rather, we mix up all these technologies, which complement each other one way or another, and in those mixtures is where we innovate in the workshop."

✔ "One thing that characterizes what we do in the workshop is that its initiatives are bottom-up; they come from the rank and file, from the technicians and the professionals, not from university authorities."

✔ "Another important aspect we look at is working from home. Above all, we look at the new skills required and the new job descriptions that have emerged, one of which could be 'streaming expert.' These are very specific job profiles that describe people who work in 'virtualization,' people with knowledge about transmitting videoconferences and streaming technologies. There are still few experts in these fields, and so that means that the workshop is also a space for professionalization."

✔ "One of the workshop's strengths is fostering collaborative work and collective solutions. Also, the creation of networks for collaboration, where each one contributes from his or her experience and field of discipline: engineers, graduates in systems, maintenance technicians, experts in communications, and community managers, among others. It's a strength that grows as the networks grow."

✔ "One of our very satisfactory achievements was multi-streaming, or the simultaneous use of all our social networks and all our digital communications media. Then later, that transformed into something known as 'broadcasts,' that is, the generation of signals that travel all over the Internet, that go out to the whole world."

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Esmeralda Martínez

net access, compared to only 46 percent in rural areas. We're talking about approximately 50 million people in Mexico who still don't have connectivity. The pandemic also made us realize the enormous gaps in use and appropriation. What are those? Broadly speaking, this means the user can't really utilize the technologies; that is, he or she can't carry out the basic activities required for their reflexive, innovative use. However, we can also say that one of the advantages of the pandemic and the incorporation of virtuality in our lives has been that they've forced us to acquire these skills and knowledge.

With regard to the future, a widely recognized specialist in technology, Marc Vidal, defines the stages that technology will necessarily have to go through. He holds that in the next very few years, virtual reality and augmented reality will be incorporated into education. The question is what we professionals in technologies are doing to train future users. What are we doing to be able to contribute to reducing the gaps that today seem to be continuing to grow?

DIB: One last question, Miriam. Can we say that professionals in technology, who previously worked with software, machines, and processes, are now going to work also with people?

MO: Well, in fact, we've always worked with people. Let's say that virtuality has its shades of gray. This has pushed us to orient and train users more so that they can acquire the minimum competencies and skills they need in handling these new technologies. We've also dedicated more of our time to online group activities, to online events, to servicing people on line. Yes, these are totally different practices from those we were used to, but they've always been with people. Of course, certain complications have arisen because so-called digital immigrants, people who have had to adapt to the use of technologies almost from the beginning and are very accustomed to their in-person activities, have more trouble with this. But, at the end of the day, we've moved ahead without huge problems. Of course, teachers most frequently still give classes on line as though they were in person, but every day, more and more of them introduce innovations and get more out of the infinite possibilities offered by digital technologies. The idea is to get knowledge to students at any given time, by diverse means —for example, audio recordings

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on Spotify, tutorials on YouTube, etc.— and go online just to clear up doubts and offer advisory services about what they've learned. That, in my opinion, is educational innovation.

DIB: Esmeralda, perhaps you could conclude by telling us about what daily life looks like in this era of forced virtuality.

Esmeralda Martínez (EM): Sure, Diego. As a professional in the field of technology, as the mother of children in two different grades, primary and high school, and, taking into consideration each person's individual characteristics, I've been able to observe the psychological consequences of the pandemic. Beyond just changing from in-person to virtual, in the field of education, students have also been affected. It's not the same to see your fellow students in little boxes on a screen as to have physical contact. Sure, people's personalities have a lot to do with this. For example, for some university researchers, it's been relatively easy to adapt to the new technologies, while others resist the change, or just freeze up. We're immersed in a process of changing mentalities, changing paradigms.

The divide that Miriam was talking about isn't just digital and knowledge-linked; it's also socio-economic. For example, if families like mine, with only two children, have a hard time investing in two devices, you can just imagine what happens in homes with large families, or in places where two or more families live together. The same thing happens with access and the quality of Internet service.

DIB: They seem to have thrown us into the deep end before we know how to swim.

EM: Exactly. That metaphor is very apt. The problem is that that also happened to teachers, both in public and private schools, on all educational levels, including our university. There was no order to it, no general strategy, or standardized method designed and regulated by educational authorities. Instead, every school jumped into the pool and did what it could; they held onto the tools they had at hand like they were lifesavers.

Virtuality has forced us ICT professionals to be creative. We no longer need the sophisticated equipment of a few years ago, for example, for videoconferences. With just a single device with a camera and a microphone, we can do a whole lot, almost everything we used to do before with very expensive equipment. Sure, the rapid development of the platforms and distance communications programs has also helped. I agree that in eighteen months we've advanced what used to take ten years.

DIB: Another important issue is that now, with virtuality, users and employees, not institutions or companies, are having to pay the costs. Each one of us pays those costs in order to keep our jobs.

EM: In fact, the principle of virtuality was almost always thought of as something positive; but now we've been able to see that it also implies lots of problems that have to be considered, that it has its negative side that we have to face up to and change. We have to find an appropriate balance with in-person activity; we may be barely at the beginning of the effort to fully understand this phenomenon. That's why I see these changes as a virtual and technological revolution, because they involve multiple aspects: the personal, job-related, economic, social, and cultural. It's a digital revolution.

DIB: And, like with all initial stages of revolutions, we can also see chaos in this one. We'll have to remain vigilant about where this new virtuality heads, and see if it's up to the expectations it has generated or if it'll be like so many other revolutions that have ended in disappointment. Thanks to the three of you for sharing your ideas and the time you've invested in this virtual interview. **VM**