Reflections on Post-Pandemic Education and Technology

Reflexiones sobre Educación y Tecnología Post-Pandemia

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Abstract

This short text is intended to synthesize positive and negative aspects that we have experienced during the pandemic educational scheme, aspects that are projected to be in the future.
The focus will be on university issues, but many concepts exposed here are valid for other educational levels.
This summary has ten points; I have considered three of them as "positive"**(+)**, and seven "negative" **(-)**. Each of them are explained, considering its impact on education and also on the new pedagogical-technological model to be considered in the future.
In the Conclusions we consider these ten points may be extended and also that the task we have ahead is: *turn the negative aspects into positive ones, and to develop the positive aspects as well*.

Keywords: Educational transformation; Digitalization; Pedagogical-technological model; Bi-modality; Adaptive bi-modality; Teaching; Learning; Evaluation.

Resumen

En este breve texto se tratan de sintetizar aspectos positivos y negativos que hemos apreciado durante el recorrido educativo en la pandemia, aspectos que se proyectan hacia el futuro.
El foco estará en los temas universitarios, pero muchos conceptos que se exponen tienen validez para otros niveles educativos.
Está síntesis tiene diez puntos, tres de los cuales he considerado "positivos" y siete "negativos". Se expone cada uno de ellos y se analiza su impacto en la educación y en un nuevo modelo "pedagógico-tecnológico" que se avizora a futuro.
En las Conclusiones se expone que estos diez puntos pueden extenderse y al mismo tiempo se debe comprender la importancia de la tarea que nos espera: *transformar los puntos negativos y potenciar los aspectos positivos.*

Palabras Clave: Transformación educativa; Digitalización; Modelo pedagógico-tecnológico; Bimodalidad; Bimodalidad adaptativa; Enseñanza; Aprendizaje; Evaluación.

- **There is an educational transformation that will go beyond 2020 (+)**

  - The pandemic has generated a disruptive change in the teaching and learning methodologies, with the necessary and forced incorporation of technology.
  - Certainly, the teaching-learning process will be more digital and remote, getting into the bi-modality defined as a mix of presential and distance teaching and learning, using different technologies.
  - It is seen that the "online" learning has some advantages for the student (when the adequate technology is at hand and the teachers are able to use it fully), this will trigger the consolidation of this change.
  - Undoubtedly, an important leap has been made regarding innovation applied to education, and this leap should strengthen and increase along with the "adaptive bi-modality", considering the type of course, the number of students and the available technology.

- **Digitalization on Society will motivate digitalization at Universities (+)**

  - The social change framework, regarding citizens, reveals a marked tendency towards digitalization (citizen services, e-commerce, online banking, logistics, etc.). This is the "new context" for Universities.
  - Consequently, Universities will make a significant leap (also disruptive?) in their management mechanisms, towards a growing digitalization in their administration, apart from the change in the teaching and learning processes.

➢ The context of the educational transformation will be given in a digitalization framework of all the services at University (and in the educational system in general). The same actors (teachers, students, administrative and technical staff) would not accept the idea of turning back after what they have lived and experienced.

➢ This will demand more technology at Universities (connectivity, remote access, digital libraries, classrooms adapted for bi-modality, etc.).

- **The idea of "learning" over "teaching" will be reinforced (+)**

➢ The new educational-technological model that emerged and was improved during the pandemic focuses on the students, and encourages their autonomy and capacity of self-learning; this leads the way to methodological innovation and also to the changes in the instruments that the students uses in order to incorporate concepts and skills.

➢ Evidently, the pandemic has stated that "learning" and "self-learning" have become more significant than trying to "teach" from the classic model of the teacher in front of the classroom. The teacher must be inspiring/ transformative regarding the abilities of the student, including the innovations that they may suggest.

➢ We must understand that the framework is the society digitalization, with students that were born in the 21st century and they have assimilated new technologies as part of "their own world". Therefore, University and teachers are the ones who must get adapted, learn and transform our methods and technological resources thinking in this new student. Even the syllabus will be able to be examined with a new logic that covers self-learning and valuation standards of distant education.

➢ At the same time, this process weakens aspects of socialization and the training in "transversal" skills of the students that were planned for total presence in the classroom. A simple example is the concept of "teamwork" that must be reformulated according to technology and the method for each subject.

- **The access to technology is unequal and it has a negative impact on learning (-)**

➢ Unfortunately, worldwide the pandemic has showed an unequal relation among nations according to their level of development. There are very painful asymmetries as regards economic power of countries that are reflected on different issues such as citizens medical attention and vaccines. This asymmetry is also reflected in Education. The access to technology is extremely uneven among countries and the chance to "equal" Education as a basic right, is limited according to the financial capacity of the countries.

➢ Within each country, there is inequality according to the social situation of citizens, students and teachers (Argentina is a clear example of that) and due to this, a transformation in education with equal opportunities for everyone is extremely hard.

➢ The analysis, at a university level, of learning problems has a strong correlation with the social situation and the access to technology on the part of the students and teachers as well. In order to go through the change in a positive and socially inclusive way will demand political decisions and also investment. Conceptually, the effort to transform the educational system will be even more complex than the transformation of the health system… Because the effect of making no investment will impact an entire generation.

- **Education with innovative methodologies and resources demands a complex transformation (-)**

➢ While we all understand the importance of the educational-technological transformation that we must follow, it is true that there is a long way to go: teachers must complete/improve their training to be positive actors of the change; it is necessary to have technology and connectivity for the entire society, in the city and in the classrooms, and the new methods demand a process of adaptation that is not "instantaneous".

➢ Clearly, the expected transformations demand time and investment and mainly, adaptation/training of human resources. These demands will be fulfilled in different moments, increasing (regrettably) inequality in education.

- **The transformation of presence in "distance" has a different impact according to the level of the course of studies the students are attending (-)**

➢ A lesson we learned during the pandemic is that the adaptation to the new educational-technological model differs in the moment of the course of studies the students are attending (particularly at university level).

➢ Students that start university finds nowadays a disruptive methodological change, with very little knowledge of the new system they are in and with very little in-person contact with teachers and with other actors that help them in their initial adaptation to university.

➢ It is different if we think of an advanced undergraduate student or postgraduate student. In such cases, the

adaptation is easier and it can even favour the learning process of the student. This is an evident example in the case of computer sciences: advanced students and postgraduate students that are generally working professionally with a wide use of technologies prefer bimodality or a system fully remote.

➢ These asymmetries according to the level of the subjects block the use of identic methodology implementations for their development. A crucial point in the teachers training (and the educational agents) will be to understand the possible effect of the changes according to the order of the courses in the syllabus, the number of students and the previous knowledge of the same student, particularly related to the technology that will be used.

- **The change has an impact on teachers and it demands an improvement in their training (-)**

➢ An honest diagnosis of the knowledge of university teachers (and in other educational levels too) as regards the use of technological resources and methodological proposals that stem from such knowledge when technology is at disposal, is discouraging. The positive aspect has been the will to learn and get adapted from most of the teachers…But it is a process that demands time, effort and investments.

➢ We must accept that, to make this adaptation and update on the part of the teachers work, it will be necessary that the entire society that they belong to assimilates the technological change, appreciates it and supports the necessary investments to make the teaching training concrete (this includes the hierarchical position of the teacher in a more complex context).

➢ On the other hand, we have to consider if the new "pedagogical-technological" model demands a new teacher "model" with an improved training in educational technology and methodologies associated to their own use. Also, the concept of "teaching staff" and the classical curricular model of "study programme" must be re-discussed We must highlight the way of measurement for the "learning results" or "competences" applied to an Education that integrates pedagogy with technology. And this is a challenge for the entire educational system, and particularly for Universities.

- **It is necessary to think about the "optimum" integration of synchronic and asynchronous resources (-)**

➢ Another lesson taught by Education in the pandemic is that there is no direct replacement of the in-person methodology using technology. It is very hard to think about synchronic "classes" (in time, interaction with students and equal resources for everyone) that are very similar to in-person classes.

➢ The first thought that rises is that it is convenient to combine synchronic and asynchronous resources adequately, checking the time of attention students will pay and the possibilities for a teacher to share knowledge, information and training to students connected remotely.

➢ This combination of synchronic and asynchronous resources depends on each subject, its contents and methodology adopted for the teaching and learning process. Once again, it is impossible to think about a unique model that replaces in-person classes adequately and leads to meaningful learning results.

- **It is hard to adapt experimental teaching to hybrid or remote models (-)**

➢ The experimental or "lab" activities, as well as "field" studies have been very affected in the development of the courses during the pandemic. While there exists technology (remote labs, virtual Hospitals, simulators of all kinds), it is neither enough nor appropiate to replace in-person classes…And a 100% replacement may be impossible.

➢ The idea of moving forward in a detailed analysis about experimental or field tasks that are required in the training process of a student and the "leap" in the technological resources we must have (and know/master) to be used in bimodality is unfinished work worldwide. Technology will have to give their best possibilities from the immersive environments, virtual environment, high speed connectivity and the chance to work with remote sophisticated equipment…And nevertheless, there will be training tasks that need in-person classes and direct interaction between teachers and students.

- **The distant test mechanisms are not consolidated (-)**

➢ One of the most difficulties that have been found in Education during the pandemic is to assure learning test mechanisms that are fair and reflect the real knowledge acquired by the student.

➢ Apart from inequality in available resources for the students (that determines their learning process as well as their tests) there is another intrinsic conflict between the individual rights and the privacy of the student against required safety that assures that the test responds to the expected standards by the teachers (authenticate the students, follow their activity during a distant test, assure there is no plagiarism, etc.).

➤ Whereas the conceptual answers are known (continuous test, monitoring in real time, interaction with students, measurement of their active participation in theoretical/practical classes), the truth is that technological inequality and the lack of resources on the part of Universities and teachers make extremely difficult to assure equal conditions during tests. This is particularly serious in massive courses, because they generally   coincide with the beginning of the course of studies, with students who are not adapted to University yet.

➤ It is interesting to point out the "training" aspect that derives from these situations: students must take responsibility in the learning process and cooperate with fair and precise tests. The ethic of the students and teachers has been tested and surely it will tense us in the Education renovation process, with a new "educational-technological" model.

Brief Conclusions

✓ Educational transformation, with a new educational model that includes technological resources is a process that is here to stay.

✓ The "bi-modality" is a positive leap, it requires a planning that includes actions within and outside the educational system. The teachers training is necessary, as well as the access to technology for all the students, the transformation of universities and a political and social will to better the Education as a crucial goal of all countries.

✓ Mid-term politics, investment and an inevitable transformation of the University and the Educational System are required, towards digitalization and the combination of in-person, distant and blended learning.

✓ This positive transformation can extend the "scope" of Universities and better the training and update of citizens. It depends on us…

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