

# Post-pandemic digital university: theory and application to two economic subjects

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## Abstract

**Introduction:** the COVID-19 has had direct implications for university education. The forced confinement has caused non-face-to-face education to remain the main viable alternative in the immediate term. **Background:** there is no history comparable to this pandemic due to its intensity and general impact, as well as the availability of technology. Despite this, there are still many practical constraints related to unequal access to information and communication technologies by social or economic groups (digital divide). Digital teaching at the university is analyzed here, focused on two economic subjects, through a study of strengths and weaknesses. **Discussion:** the will of students and teachers, as well as third-party agents, continues to be the determining factor for the success of digital education as non-face-to-face teaching and learning. Optimal conditions are given in economic subjects, by tradition and by the support of teachers and students. Digital adaptation, accelerated by the pandemic, must not be restricted to an emergency situation, but must be consolidated, in symbiosis with traditional face-to-face education.

**Keywords:** information and communication technologies; higher education; economics; e-education.

## Universidad digital postpandemia: teoría y aplicación a dos materias económicas

### Resumen

**Introducción:** la COVID-19 ha tenido implicaciones directas en la educación universitaria. El confinamiento forzoso ha provocado que la educación no presencial quedase como la principal alternativa viable en el inmediato plazo. **Antecedentes:** no existen antecedentes comparables a esta pandemia por su intensidad e impacto general, así como por la disponibilidad de tecnología. A pesar de ello, siguen existiendo numerosos condicionantes prácticos relacionados con el desigual acceso a las tecnologías de la información y la comunicación por grupos sociales o económicos (brecha digital). **Discusión:** la voluntad del estudiantado y del profesorado, así como de terceros agentes, sigue siendo el factor determinante para el éxito de la educación digital como docencia y aprendizaje no presencial. En las materias económicas se dan condiciones óptimas, por tradición y por el apoyo docente y discente. La adaptación digital, acelerada por la pandemia, no debe quedar restringida a una situación de emergencia, sino que debe consolidarse, en simbiosis con la educación presencial tradicional.

**Palabras clave:** tecnologías de la información y de la comunicación; universidad; ciencias económicas; educación digital.

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## Introduction

The public health crisis caused by COVID-19 has been extremely serious, with no end in sight in some countries, given the delay in the delivery of effective vaccines or treatments, which, to make matters worse, are unevenly distributed throughout the world. Since the declaration of a global pandemic by the World Health Organization on March 11, 2020, the world has changed constantly, in some cases with immediacy, in its socioeconomic, legal, and political aspects, reaching even the most personal routines. The educational system in general—and the university in particular—have not been immune to these changes. Moreover, they have reacted quickly, adjusting their operation with a clear commitment to distance learning as a logical consequence of confinement at home and, once this has been lifted, of restrictions on mobility and social interaction<sup>1</sup>.

The aim of this paper is to reflect on a forced and supervening situation in university education from which advantages can be extracted despite everything. To this end, digital teaching at this educational level, focused on two economic subjects, is analyzed here by means of a study of weaknesses and strengths. The main advantages and restrictions are reviewed in the following section, and then some specific issues in two university economics subjects are analyzed. A final section concludes with a necessarily open approach. The analysis is based on the particular case of Spain, although it can be extrapolated *mutatis mutandis* to any European or Latin American country, given the similarities of the pandemic impact and its effects on university education.

## Background

### ***Strengths and Constraints on Digital Teaching and Non face to face Education***

Non face to face education, although it has been a desideratum and a complement to face to face education for many years, since 2020 has come to impose itself by the force of

health motivations that are not very debatable. However, it is appropriate to begin by delimiting the conceptual terrain ([Delgado Rivero and & Fernández Llera, 2013](#)), differentiating precisely what is meant by digital or electronic education (e education) and its two components of teaching (e teaching) and learning (e learning).

E teaching is the form of teaching based on the environment and interactivity channels of the Internet, virtual campuses, and social networks. However, it is important to tackle a fallacious synonymy, since not all digital teaching<sup>ii</sup> is distance education<sup>iii</sup>, although all distance teaching does have a digital support by definition. It follows immediately that e teaching does not aspire to replace traditional teaching, nor would this be entirely possible in countries with a very significant weight of face to face universities and with no plans to reduce them in the medium term for various social, economic, or political reasons. Of course, the above assertion has been blurred by the pandemic, especially when speaking of the acute phase of contagion and domestic confinement. In this exceptional case, it is trivial that both concepts—digital teaching and non face to face teaching—are equivalent since all e education (both in its teaching and learning facets) necessarily becomes a non face to face activity.

By assimilation, e learning is the type of study that also takes as a basic reference the Internet environment, virtual campus or classrooms, and social networks. Thus, it can begin in the classroom, but it would have continuity beyond this physical enclosure through a virtual ubiquity, either at home, in public or private spaces enabled for this purpose, on a smartphone or any other similar device, increasingly with more features and possibilities ([Paramio Pérez, Delgado Morales, & De Casas Moreno, 2018](#)).

What is desirable is always that e teaching and e-learning feedback. The innovation introduced by both components of e education is neither unique nor strictly technological, but lies in the rupture of the classic spatial temporal barrier, thus exceeding the strict limits set by rigid timetables or a limited physical area. This new teacher-student dimension makes it possible to construct new teaching learning concepts,

maintain permanent contact (synchronous or asynchronous), design more versatile tasks, and evaluate based on tasks and competencies (Tejada Fernández, 2011). There is another obvious advantage derived from participation in wider communities—we would say worldwide—that allow interaction with colleagues from other universities and/or disciplines, sharing common problems and cooperating in the development of educational materials.

The beginning of large scale technologized university education could be placed in the last decade of the 20th century. This was the explosion of internal university networks (intranets), virtual campuses, and telematic learning management tools (Moodle or similar), as well as TED talks (Sanz Arcega, 2020), the TED ed tool (Díez Minguela & Añón Higón, 2015), and OCWs or free to use teaching materials (Sicilia Urbán, 2007). Shortly afterwards, MOOCs or massive open online courses (Daniel, Vázquez Cano, & Gisbert Cervera, 2015) were consolidated, culminating in the revolution of general social networks such as Facebook or Twitter, professional ones such as LinkedIn, or leisure ones such as Instagram, with their respective applications to the academic field (Levis, 2011). Social networks are not free of dangers, as Siemens and Weller (2011) or Gallardo López and López Noguero (2020) warn, due to risks of addiction, dependence, or self interested manipulation of information, among others. The growing importance of gamification and the application of cultural mechanics to regulated teaching learning environments should also be highlighted (Cruz Ruiz, Zamarreño Aramendia, & Ruiz Romero de la Cruz, 2017; De los Ríos et al., 2019). In the face of this potential, there are still institutions and individuals who are refractory to change, for whom any innovation becomes a sacrifice. This only demonstrates a lack of resilience, something that had already been warned about some time ago (Becker & Watts, 2001).

All educational stages are susceptible to coupling e education and, at the same time, they constitute a test laboratory to exploit the advantages derived from non face to face education. But it is no less true that university education seems optimal for the distance mode

for at least three reasons: accumulated experience (especially when there is an innovative teaching staff and a proactive student body), the technological environment of mass use, and the greater possibility of interaction offered by a student body that is mostly made up of “digital natives.” In the latter, there is no difference with pre university stages, but it is also assumed that they have sufficient personal maturity in accordance with their coming of age<sup>iii</sup>. Looking at the teaching staff, authors such as Cabrera, Poza, and Lloret (2019) have summarized it in a clear way: university professors must mutate to the digital world, or they will become extinct. At this point, it is not idle to remember that many university professors are also “digital natives” or, at least, “immigrants” (Piscitelli, 2006) who have managed to enrich their initial background with specific training in new technologies applied to teaching (Valero Rueda, 2015; González Bello, López Espinosa, & Estévez Nenninger, 2017; Cejas León and Navío Gámez, 2018; Rodrigues Brito & Correa Cortela, 2020).

However, despite all these strengths, even deflated by the aforementioned factor of resistance to change, there are several types of constraints: institutional, technological, temporal, and psychopedagogical or volitional. In each one, there may be nuances depending on age, gender, socioeconomic status, or other characteristic, so, none of these problems is rigid (Álvarez Sigüenza, 2019).

### ***Institutional Restriction***

Institutional constraint or organizational inertia is what imposes limits to the fit of a curriculum with ambitious learning objectives and broad competencies in 3 or 4 courses and subjects making up “semesters” (sic) of 12-14 actual weeks.

Since the last decade of the 20th century, the deployment of the European Higher Education Area (EHEA) and the Ibero American Knowledge Area has been a fact. Although with different rates of momentum and convergence, they have the same shared objectives of bringing the respective educational systems closer together, promoting student and teacher mobility, advancing in the mutual recognition of degrees, and promoting

the quality of education (Quicios García, 2012). Spain, as a member state of both spaces, occupies a central place in the achievement of their goals (Quicios García, 2012).

Although there are many aspects to be addressed, it is necessary to limit ourselves here to the synthetic programs of the subjects of yesteryear, which have been transmuted into “teaching guides,” sometimes repetitive and excessive, based on learning competencies—and not on content, which is not always well considered or is directly and severely questioned (Del Rey & Sánchez Parga, 2011). The main novelty is that the “teaching guides” operate as a sort of “learning contract” between students and teachers and are binding in nature (Mateos Masa & Petrus Bey, 2013; Ruay Garcés et al., 2017). This academic document includes the contents of the subject and the evaluation system (so far, little new), but also a detailed weekly—if not daily—timetable and a profuse detail of competences, resources, and learning objectives (Martín González, Uriarte Arciniega, & Ciaurri Pellejero, 2008).

The main advantages of the “learning contract” are mutual engagement and trust between the two parties as the keys to academic success and meaningful learning. However, it suffers from serious limitations. To begin with, the group size of the class, in many cases, exceeds the capacity for personalized monitoring of each student by the professor. Secondly, there is the excessive rigidity of the “contract” itself, making it difficult to adapt to changing circumstances, as is notoriously the case in a state of alarm. Professors see how their planning suddenly falls apart, and students run the risk of the subject not meeting their learning objectives. A comfortable but unfair and almost fraudulent solution is to lower academic requirements (in the extreme, an “overall pass”), which solves the problem of evaluation, but compromises the development of the subject. In the immediate term, any other alternative involves the adaptation of time and tasks to the non classroom modality exclusively. In the medium term, other possibilities could be considered, such as extending the academic year during vacation periods, although this would be more of a postponement of the problem, not a solution.

The unit of account in the EHEA for meaningful learning is the “European credit,” computed by the hours of work required for the acquisition of knowledge by students, as well as of skills and abilities corresponding to each subject (Vanistendael, 2005). Each “European credit” comprises between 25 and 30 hours, although most Spanish universities have placed themselves at the minimum threshold. By virtue of their autonomy, each academic institution also regulates the percentage of face to face teaching, although it is commonplace that it is around 40% at the undergraduate level, i.e., about 10 hours. This consensus was easy in times of normality, but it is by no means the case during a state of alarm with confinement, whether total or partial, where non face to face teaching gets close to or reaches 100%. The most affected faculty must urgently reschedule their subject matter, redesigning teaching materials to deal with distance teaching. This new task imposes an additional workload on top of the hours dedicated to research and management (Negrón Rivera, 2019). In addition, this must be implemented outside the usual work center, in many cases, with confinement in a room and with new occupational health risks<sup>iv</sup>—assuming that the technology available at home is adequate, which is not always the case.

### **Technological Restriction**

Since the generalization of information and communication technologies, a classic issue has been the digital divide, first in a dichotomous manner (availability vs. non availability of devices and networks) and then in terms of access to several computers simultaneously and/or to increasingly advanced software. This “primary” divide has not disappeared, but it has been mitigated thanks to high public and private investment. Nevertheless, there is also a certain risk that “hardware” (sic) may end up taking the place of pedagogy, as warned by Mojarro, Rodrigo Cano, and Etchegaray Centeno (2015) or summarized by Salman Khan, Princess of Asturias Award for International Cooperation: “Technology is useful if it contributes to the service that the teacher provides to students” (Zafra Díaz, 2020).

What does persist is a “secondary” gap, derived

from a differentiated—and not always useful—use of new technologies, although the most serious, because of its social scope and because it tends to deepen, is the “tertiary” gap. The latter indicates the difference between a fully technologized society and an education system that resists digitization (Selwyn, 2010; Fernández Enguita & Vázquez Cupeiro, 2016).

For a non face to face education with guarantees, the minimum technological equipment requires a desktop, laptop, or tablet with the necessary specialized programs (office automation, telematic communications, and standard browsers, in any case) and with an Internet connection of sufficient quality. With regards to user competence, it is taken for granted among the aforementioned “digital natives.” but not always among the more senior university faculty, although it should certainly not constitute an insurmountable obstacle in any case, much less a pretext for inaction. On this point, higher academic institutions—and the public education system as a whole—must pay special attention to closing the digital divide in all its manifestations, with plans and programs for investment and technological immersion, pedagogical actions for students, and faculty training courses for teachers, all of them with the aim of compensating for baseline income inequalities and overcoming resistance. Otherwise, there is a high risk of academic regression and social exclusion, much deeper among the student body.

Another additional difficulty should be noted, which, while not new, has been accentuated by the proliferation of non face to face work and distance education: The risks derived from the interoperability of platforms, personal privacy, and cybersecurity. Some concrete exhibits are the loss of continuity in educational activity, fraud in evaluation, or the hacking of institutional portals.

In the specific case of social networks (not all, but the most used ones), these are tools created for purposes far removed from e education, so they require a unique adaptation and supervision for the academic environment.

### **Temporary Restriction**

The time constraint has two manifestations. To begin with, in non face to face activities,

a distinction must be made between those involving synchronous and asynchronous tasks. In the latter, time is separated from space, since they are tasks in which the teaching staff prepares materials and publishes them in a digital repository, web portal, or virtual campus so that students can use them at their own pace, without this being incompatible with the fulfillment of certain objectives or deadlines. On the other hand, in synchronous tasks, the simultaneous virtual meeting of teachers and students is required, as in the case of a chat tutorial or an oral lesson with concurrent comments and questions.

The second temporal manifestation has to do with the period of adaptation to the non face to face environment, which is much more costly in the absence of a proven experience, *ceteris paribus* the technology. In the specific case of the state of alarm with confinement, the adaptation had to be immediate, overcoming the problems with no possible alternative in the short term by force of circumstance<sup>v</sup>. For most professors and students, it was not a major problem, but it was for the most resistant. It is true that, had there not been a serious and emergency, perhaps the adaptation would not have taken place, claiming these (salvageable) problems to be (insurmountable) difficulties.

### **Psychopedagogical or Volitional Restriction**

This restriction operates as an envelope. It is tantamount to saying that, if there is a strong will on the part of all parties involved (including teachers, students, managers, and funders of university education), almost any present or future problem of non face to face university education would be corrected to minimizing its negative consequences.

A *contrario sensu*, if there is no such favorable disposition, any progress in this direction will be ignored or boycotted by its detractors (any of the agents or a combination of any of them). If the latter happens in times of normality, the only thing that will have been achieved by the detractors of this teaching modality will be its postponement, more or less delayed, although hardly its absolute impediment. But during a state of alarm with confinement, trying to slow down

or hinder the development of distance education can only lead to one result: the total paralysis of teaching, with the consequent deterioration of meaningful learning, without prejudice to other disruptions in the general teaching program.

To conclude, a taxonomy of attitudes could be defined according to a double descriptor of willingness and outcome. Thus, groups or individuals with a favorable will and a successful outcome in non classroom education would be "optimal." Those with good will and unfavorable outcome would be qualified as "positive failures" and would be salvageable in the more or less distant future. Those who do not have propitious will, but do achieve success, could only be called "lucky," which in no way guarantees that there will be a new success to come. Finally, the worst situation would be the "negative failures," since they have neither will nor good results, and must modify their attitude, so as not to perpetuate themselves in this pernicious situation.

### ***Applied Results in Economic History and Public Economics***

The general scheme of advantages and restrictions that has just been summarized has infinite nuances, depending on the subject in which distance education is applied. It is unquestionable that some are very suitable for coupling this modality, while in others it is less viable (think of chemistry laboratories), although some specific tasks can always be implemented (following the example, a videoconference with remote equipment).

In the legal social field, teaching innovation, and digital education have a fertile field for its cultivation, due to tradition and possibilities. Specifically, this paper focuses on two specific subjects, Economic History (EH) and Public Economics (PE), both of which are compulsory in university curricula in Spain. The basic objective of EH is "to study and analyze the success (or failure) achieved by the different economic systems in the production of goods and services aimed at satisfying the consumption needs of human beings [...], therefore, of those aspects of the relationship between man and the environment that have to do with economic life,

[applying] economic and historical methods to the study of the past" ([Tortella Casares, 1994](#)). PE, for its part, includes the study of public financial activity of income and expenditure, but also other more recent topics on collective choice ([Fernández Llera, 2009](#)), public management, regulation, or macroeconomic aspects of economic policy ([Monasterio Escudero & Suárez Pandiello, 1999](#); [Gimeno Ullastres, 2005](#)).

In addition to its academic recognition, the EH, PE and its eventual intersections ([Fernández Llera, 2019](#)) have another advantage, as is its connection with current issues, among them, the very effects of the COVID-19 pandemic.

On the EH side, the study of the current health and economic crisis invites us to look at precedents in epidemics and plagues of the past, also with significant effects (Cipolla, 1993). On the other hand, from PE, a phenomenal background can be gleaned from the actions of the public sector after the Great Depression following the stock market crash of 1929 and the Great Recession that began in 2008, in both cases with unknown countercyclical fiscal and monetary policies, due to their innovative and wide ranging scope. The historical taxation analysis of causes, consequences, similarities, and differences is very motivating for professors and students.

In the practical classes—and this applies to both face to face and distance learning—there is a great deal of room for teaching innovation in both subjects. Thus, the analysis of texts and statistics, discussion techniques, introduction to economic research, and visiting lecturers are particularly suitable.

Regarding the analysis of historical and/or current texts and statistics, there are multiple options available on the Internet, including primary and official data sources, readings, audiovisuals, questionnaires, or other teaching materials. The teaching role is to make a previous effort of screening and selection, adapting the difficulty of the chosen resource to the students' background, trying to connect with their previous knowledge, but without renouncing to a demand of effort, so as not to end up falling into the mere repetition of the theoretical classes. The sequence of the work to be developed by

the student should begin with the historical contextualization of the text, data, or material selected, followed by the summary of concepts and ideas and culminating with the personal analysis, the latter being the part that requires the most effort, since it involves unraveling the main ideas, connecting them with each other and with related notions, building a hierarchy between concepts, and identifying the web of relationships that articulate the overall ideas.

For their part, the debates in the form of a confrontation between opposing views are very useful for contrasting arguments on issues in the subject of study, especially when they can be linked to current issues. Their realization allows the introduction of elements of reflection, dynamism, and interactivity in face to face classes, as well as a clear encouragement of teamwork by students. In this way, the evaluation of the subject becomes another phase of the process, in which both the professors (coordination and direction of the debate) and the students (preparation and defense of opposing positions) are involved. The development of this activity is valid in the classroom, but also in the non classroom modality or even in a combined way, through standard interaction tools.

The introduction to historical economic research can be another particularly motivating aspect for students, through the consultation of paper resources and reports, and, moreover, by browsing web pages and blogs of institutions or organizations that contain statistical and documentary sources. These sessions could be presented monographically throughout the course or intertwined within other practical sessions.

The possibility of having visiting lecturers, not only from academia, but also from the professional, political, social, or journalistic fields, can complete the range of practical content of EH and PE subjects.

To this end, classroom talks can be promoted, which can even be organized as lectures open to the public and not only for students of the subject. As already mentioned, TED talks would cover this non classroom flank.

Finally, general teaching innovation is highly desirable in any context, including the extension

of digital education and non face to face teaching now that there is no other choice in the face of absolute or attenuated confinement. It is worth remembering that several decades ago, some great specialists (Comín, 1985) were cautious about the sudden and extensive use of computers in the discipline of EH. Although this reticence was focused more on the research aspect, it is not difficult to extrapolate that skepticism to teaching. Obviously, the current panorama is very different from the supply side (more, better, and more widespread technologies) and the demand side (digitized population), which should serve to break down any reservations still held by people who are less receptive to change. In this regard, the meritorious work carried out since 2006 by the *e-pública* journal, a specialized publication that follows in the footsteps of other prestigious international journals with a long history, such as the *Journal of Economic Education*. In the discipline of EH, the educational innovation effort undertaken by the Spanish Association of Economic History (AEHE), whose web page is a valuable repository of materials and experiences, is very noteworthy<sup>vi</sup>.

## Discussion

The impact of COVID-19 has been—and will continue to be—extreme, sudden, and universal, the latter in the double sense that it has affected the entire planet (pandemic) and all spheres of action (including university education). The forced confinement initially decreed in many countries of the world led to an unprecedented situation up to that time, with the paralysis or hibernation of a large part of economic sectors and ordinary activities.

The digital environment and the non face to face education modality have been to a large extent the lifeline for universities, just as teleworking in general has been in other areas. It was an option up to that moment but was converted by the force of circumstances into almost the only viable alternative in the immediate term. However, there are still many

institutional, technological, temporal, and psycho pedagogical restrictions that may hinder its success in practice, although with an adequate willingness to move forward on all sides—as in almost any aspect of life—the challenge can be overcome. In any case, this immersion at a stroke will not be idle since it will at least guide the way for its adaptation to future scenarios similar to this one or even in situations of normality.

In the eventuality of massive new confinements—or even without them—the development of the teaching activity in non attendance mode must be planned with time and rigor, including at least the establishment of a common and coordinated framework of action for the university system, objective academic criteria, a stable funding horizon, and sufficient flexibility for its adaptation to different scenarios.

The case of two economics subjects in Spanish universities is significant of this new reality, due to its own history, its current performance, and its future realization. The analysis carried out and the results obtained can easily be extrapolated to the European and Latin American context, changing what needs to be changed according to the institutional, social, and economic realities of each country, but without changing too much the argumentative background.

In short, the COVID-19 shock has led to a spectacular growth in e education, in particular in the distance mode. On this path of no return, face to face university education, as we have known it, will no longer be possible almost exclusively. Of course, this does not mean that this modality should disappear altogether. It should obviously continue to exist, but now in symbiosis and close interaction with e education, combining the advantages and minimizing the problems of one and the other in such a way that an effective and efficient blended education is configured, as pointed out by [Villacrés Pástor et al. \(2017\)](#) or [Núñez Barriopedro, Monclúz, and Ravina Ripoll, \(2018\)](#).

Higher educational institutions must continue to be committed to quality e education and to a flexible combination of face to face and non face to face education. However, this must be implemented with a reinforced control of non face to face educational activity to prevent

academic requirements from being excessively lowered or this modality from being perverted to the point of becoming a light substitute for face to face education. Time will tell whether the process is willingly undertaken by the agents involved or “by force of circumstance.”

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<sup>i</sup> En España se decretó un primer estado constitucional de alarma sanitaria que duró 99 días, con un confinamiento domiciliario absoluto al principio. Se suspendió toda actividad educativa presencial y se obligó a mantener la enseñanza a través de modalidades telemáticas, siempre que resultase posible.

<sup>ii</sup> Por ejemplo, podría darse el caso de un trabajo con videojuegos didácticos en la propia aula.

<sup>iii</sup> Este último supuesto sería objeto de un estudio psicosociológico que excede el objeto de este trabajo.

<sup>iv</sup> Algunos son por problemas de visión, situaciones de estrés o lesiones óseo-musculares.

<sup>v</sup> Su significado lo ofrece el Instituto Cervantes (<https://bit.ly/3vvOGDN>) [consultado el 9 de enero de 2022].

<sup>vi</sup> A las webs de e-pública (ISSN 1885-5628) y de la AEHE se acceden a través de <https://bit.ly/2JcbpwR> y <https://bit.ly/3oCvqJJ> [consultado el 1 de marzo de 2022].