

# ENTREPRENEURIAL UNIVERSITIES' METAMORPHOSIS: ENCOUNTERING TECHNOLOGICAL AND EMOTIONAL DISRUPTIONS IN THE COVID-19 ERA

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## **Acknowledgment:**

The authors recognized the financial support provided by the Misum Stockholm School of Economics (Sweden).

## **Suggested citation:**

Guerrero, M., & Pugh, R. (2022). Entrepreneurial universities' metamorphosis: Encountering technological and emotional disruptions in the COVID-19 ERA. *Technovation*, 118, 102584. <https://doi.org/10.1016/j.technovation.2022.102584>

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## **Abstract**

Entrepreneurial universities (EU) have received much attention over the last few years. Although the well-articulated contributions in the literature, empirical evidence substantiating the EU's disruptive responses in challenging times is scarce (e.g., crises, natural disasters, pandemics, Belic conflicts, or wars). This study theorizes the EU's metamorphosis due to technological/emotional disruptions to respond to evolving COVID-19 stakeholders' needs. We design a two-step qualitative methodological design in twenty well-representative EUs across the globe by adopting a mixed theoretical approach. Our findings shed some light on two relevant insights: (a) how the EU disruptively re-oriented the core activities to respond to the stakeholders' needs during a shake-out event (the COVID-19 pandemic); and (b) how a disruptive shake-out event (the COVID-19 pandemic) re-stimulates an EU structural and identity metamorphosis. A proposed theoretical framework extends previous studies on understanding how the EU's metamorphosis could occur due to an external shake-out event. A provoking discussion and implications for theory, practice, and policymakers emerge from our findings.

## **Keywords**

Entrepreneurial Universities; Technological-Digital Disruptions; Emotional Disruption; Organizational Identity; Organizational Metamorphosis; Stakeholders theory; COVID-19 pandemic

## **1. Introduction**

On January 1st, 2020, the World Health Organization (WHO) announced a severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes a new disease called coronavirus. Two months later, the WHO recognized coronavirus as a pandemic (COVID-19). Hereafter, we started

to observe worldwide restrictions related to the pandemic (e.g., stay-at-home orders, shelter-in-place orders, shutdowns, or lockdowns). According to WHO, at the time of writing, there have been 108 822 960 confirmed cases of COVID-19, including 2 403 641 deaths worldwide. According to the June 2020 World Bank Global Economic Prospects, the pandemic's immediate impact was a 5.2 percent contraction in global GDP in 2020 - the deepest global recession in decades. UNESCO estimates that over 1.5 billion students in 165 countries were educational and emotionally affected due to the COVID-19 pandemic and coped with the socio-economical changes. According to the World Bank, this is set to recover somewhat in 2021 but remains well below pre-pandemic global output figures. This is despite the efforts of governments to counter the downturn with fiscal and monetary policy support. On a longer horizon, the deep recessions triggered by the pandemic are expected to leave lasting scars through lower investment, an erosion of human capital through lost work and schooling, and fragmentation of global trade and supply linkages (World Bank, 2020). Extrapolating forwards from these facts, the potential impact on entrepreneurial communities, small businesses, and regional economies more broadly, especially in less favored and less resilient settings, is alarming.

A prominent example is the previous decade's recession. Concretely, the 2008 financial crisis morphed into multi-faceted social, political, and economic challenges worldwide. While the crisis exposed critical problems and unsustainable developments in many countries, the crisis also made clear just how interdependent and interlinked the global economies are (Carayannis and Rakhmatullin, 2014). The response to the financial crisis shake-out was a coordinated economic and cohesive agenda in Europe (e.g., Europe 2020 strategy and RIS3). As a result, a new paradigm emerged where government, industry, university, and civil participants work together to co-create the future and drive structural changes far beyond the scope of what any organization/person could

do alone (Carayannis and Campbell, 2010). The so-called “quadruple helix model” focused on cooperation in innovation via the dynamically intertwined processes of co-opetition, co-evolution, and co-specialization within/across sectors, regions, and eco-systems (Carayannis and Campbell, 2010). There is little about the link between entrepreneurial universities (EU) and shake-outs within this picture. We have identified at least three specific research opportunities.

*The first gap in the literature is related to entrepreneurial universities’ role in responding to their stakeholders’ needs during shake-outs as the 2008 financial recession and the current exposure to the COVID-19 pandemic.* According to the *stakeholder theoretical approach* (Venkataraman, 2002; Freeman et al., 2010), it is expected that all entrepreneurial universities’ core activities (teaching, research, and entrepreneurship) should be adapted based on their vision and capabilities to engage multiple stakeholders’ needs as well as to respond to external changes (Guerrero and Urbano, 2019; Eringfeld, 2020). Little is known in the academic literature about how the EU responds to stakeholders’ needs pre, during, and post external shake-outs like financial crises, natural disasters, or pandemics (Guerrero et al., 2016b). Paying attention to the *digital disruption approach*, the literature recognizes that organizations produce an agile response for achieving twenty-first-century opportunities through new business and innovative models (Nambisan, 2017; Kraus et al., 2018). In this view, the EU is already known to be responsible for technological, entrepreneurial, and innovation disruptions (Guerrero and Urbano, 2019). A good example is how the EU has designed disruptive digital and artificial intelligence initiatives for changing its business models, such as MOOCs and virtual campuses (Guerrero et al., 2021). Yet, little is known about which digital disruptions have taken hold as the EU responds to external shake-outs like pandemics (Skog et al., 2018; Agasisti and Soncin, 2021; Guerrero et al., 2021; Lee et al., 2021).

*The second gap in the literature is related to the EU's identity metamorphosis derived from these shake-outs.* According to the *organizational metamorphosis approach*, any shake-out incites to develop disruptions to respond to shareholders' needs, but these disruptions also generate metamorphosis in any organizational structure and identity (Starbuck, 1967; Guerrero et al., 2016; Utesheva et al., 2016; Purcell and Lumbreras, 2021). The COVID-19 pandemic has raised important questions that should be answered at the intersection of digital technologies, societal needs, entrepreneurial behaviors, and organizational identities (Battisti, 2019; de Boer, 2021; Eringfeld, 2020; Perrotta, 2021; Yang and Huang, 2021; Jung et al., 2021; Agasisti and Soncin, 2021). Disruptions also imply not only structural changes but also a transformation of values and emotions. According to the *organizational identity approach*, adaptation to disruptions rapidly transcends the routines/identities to metamorphose into a more agile and evolved organization (Utesheva et al., 2016). Typically, the EU identity represents the efforts to foster the university community's entrepreneurial mind-set (students, managers, academics, researchers, staff, alumni) and social/entrepreneurial engagement with stakeholders' needs. While the link between disruptions and identity configuration is clear, the impacts of technological disruptions on identity and the role of identity shifting and transformation within an organizational to response to shake-outs remain unexplored (Utesheva et al., 2016). Indeed, in the context of COVID-19, the *emotional disruption approach* enriches our understanding of how emotions play in organizations' functioning, individuals' actions, and effective work performance (Lawless, 2018) and reinforces an emergent EU *humanistic management* view that is focused on protecting/promoting human dignity and well-being (Pirson, 2017). Previous literature has highlighted/explored certain emotional responses in an inherent part of teaching and research, such as demonstrations of sympathy-empathy (Lawless, 2018), high feelings of "anxiety" (Berg et al., 2016), dynamic

masking (Bain et al., 2017), and importantly the rise in mental health problems within academia (Shaw and Ward, 2014). However, the emotional and well-being effects on those working within contemporary organizations are absent in the EU literature, excepting a handful of examples (De Boer, 2020). Sometimes the challenges of dealing with various evolving roles and activities in challenging times need to be discussed (Pugh et al., 2016). Yet, little is known about how digital/emotional disruptions to respond to shake-outs (in)directly produce metamorphosis for organizational identities (Utesheva et al., 2016).

Based on these research gaps, this study theorizes the EU's metamorphosis due to technological/emotional disruptions to respond to evolving COVID-19 stakeholders' needs. More concretely, a proposed theoretical framework emerges from this study to extend previous studies on understanding how the EU's metamorphosis could occur due to an external shake-out event (crisis, pandemic, natural disaster, war). Our eclectic theoretical approach considers conceptual foundations provided by the stakeholder approach, digital disruptions, emotional disruptions, organizational identity, organizational metamorphosis, and humanistic management that are useful to understand the complexity of the analyzed phenomenon. Our methodological design included two steps. In the first step, drawing on in-depth interviews with academics in twenty well-representative "entrepreneurial universities" worldwide, we explore technological and emotional disruptions in their lives across their university core activities. The dual analysis explores both: (a) the technological disruption that has taken place in the research, teaching, and engagement core activities and (b) the emotional disruption that has taken place as part of the wider pandemic scenario for those who work within the university. In the second step, based on in-depth interviews with university managers and secondary sources of information, we explore the EU structural and identity metamorphosis derived from the identified technological and emotional disruptions during

the shake-out event. Our findings shed some light on how the COVID-19 stakeholders' needs demanded a critical, agile, and proactive response of the EU by incorporating technological/emotional disruptions that re-oriented the core activity (teaching, research, and business engagement), as well as how the COVID-19 pandemic re-legitimized the impact of the EU's entrepreneurial and social identities on societal value creation. Interestingly, our study also provides insights into how the COVID-19 pandemic re-stimulated an EU's structural metamorphosis based on the hybrid business models thinking on personalized students' needs and the implementation of hybrid workplaces, as well as how the COVID-19 pandemic re-activated an EU's humanistic identity metamorphosis where the leadership takes care of diversity, equality, and well-being culture inside and outside the university. Afterward, we discuss academic contributions, practical implications, future research opportunities, and scholarly impacts based on these findings.

After this introduction, the paper is organized as follows. Section 2 introduces the micro-foundations about entrepreneurial universities' role and disruptive transformations in challenging times, suggesting our proposed theoretical approach. Section 3 presents the methodology, describing the data and the research methods used in the empirical study. Section 4 shows the main findings of the study, as well as discusses the results considering the literature reviewed. Finally, Section 5 presents the main conclusions, limitations, future research lines, implications, and expected scholarly impacts.

## **2. The entrepreneurial university disruptive response to stakeholders during shake-outs**

### **2.1 Entrepreneurial university and Shake-Outs**

The EU is seen as a key player within the entrepreneurial knowledge-based society, which is to say places where knowledge-based entrepreneurship has emerged as a driving force for economic

growth, employment creation, and competitiveness (Audetsch, 2014). The EU has emerged as a “natural” incubator that provides support for fostering entrepreneurship and innovation in the university community (e.g., students, alumni, staff, academics) (Guerrero and Urbano, 2012). In this view, the EU has developed a socio-economic identity through three core activities: (i) teaching as a human capital producer that provides the industry with highly qualified graduates; (ii) research as a knowledge capital-producer that generates advanced knowledge and disruptive innovations; and (iii) commercialization or business engagement as an entrepreneurship capital-disseminator that provides graduates/academics who become job creators or intrapreneurs, and ideas to be capitalized upon via knowledge-exchange activities (Guerrero et al., 2015). The so-called social and entrepreneurial identity has been legitimized by social innovation and entrepreneurship, regional governance activities, and civic roles in their localities (Goddard et al., 2014; Benneworth and Cunha, 2015; Pugh et al., 2016, 2018). Frequently, the “engaged university identity” gets used as an iteration on the EU to account for these wider than purely economic roles (Berenitz and Feldman, 2012; Guerrero et al., 2016a; Thomas and Pugh, 2020), or as Audetsch (2014) describes EU like the university for the entrepreneurial society.

Although previous studies suggested that the EU are organizations with a faster response or adaptation to internal and external uncertainties (Clark, 1998; Romero et al., 2020), most universities have shown modest results by changing organizational structures, incentive systems, and strategic priorities (Gianiodis and Meek, 2020). Evidence suggests that only a few elite universities (e.g., Ivy league in the U.S. or Russell group in the U.K.) have successfully explored-exploited the generation of human capital, knowledge capital, and entrepreneurial capital to impact stakeholders’ needs (e.g., students, alumni, faculty, employers, policymakers, society) (Gianiodis and Meek, 2020). The dialogue between the university and its stakeholders (students, staff,

policymakers, businesses, third sector) is also critical along several lines, such as the identification of new opportunities (Vos et al., 2016), the development of innovative and entrepreneurial capabilities (Leonidou et al., 2018), the generation, diffusion of innovations (Troshani and Doolin, 2007), and the impact on sustainability (Lenssen et al., 2006). Anecdotal evidence provides a few insights about how the EU has responded to external shake-outs (e.g., economic crises, natural disasters, pandemics, wars) or have supported their stakeholders' needs (e.g., students, academics, employers, policymakers, society) during these shake-outs (Guerrero et al., 2016b). We assume that, in turbulent technological environments, the EU especially becomes more innovative, risk-taking, and proactive in fostering entrepreneurial and innovative initiatives in their students, professors, managers, and staff (Guerrero and Urbano, 2012, 2019) and their engagement with their stakeholders (D'este and Perkmann, 2011). In this assumption, the EU implicitly re-focuses core activities, business models, and develops technological as well as other disruptions to respond to stakeholders' needs, resulting from external shake-out effects (economic crises, natural disasters, or pandemics).

## **2.2 Entrepreneurial university' identity metamorphosis due to shake-outs**

In Biology, metamorphosis strikes a change of form or structure in an individual after hatching or birth. By using this paradox, Starbuck (1967, p. 113) defines an organizational metamorphosis as a structural change punctuated by an abrupt major transformation that sharply distinguishes one period of an organization's history from another. In this perspective, organizational metamorphosis has been mainly derived from external events/forces that have impacted the organizational structures-functions like World Wars and Grand Depression (Starbuck, 1967, p. 132). Any organizational evolution is focused on continuities and discontinuities with a greater role of organizational and environmental paradigms that transform identities, leadership roles (Tushman

and Romanelli, 1985; Utesheva et al., 2016), business models, and distinct social value returns (Brickson, 2007; Purcel and Lumbreras, 2021). Likewise, the history of the EU evolution has highlighted several higher education revolutions associated with the evolution of the missions/core activities into teaching, then research, and currently entrepreneurial (Guerrero and Urbano, 2012). More concretely, the adaptation environmental uncertainties related to technological, social, and economic paradigms have historically transformed/reinforced the EU structures, roles, missions, values, and configuration of entrepreneurial and social engagement identities across the historical stages (Audretsch, 2014). In this assumption, the EU implicitly will be disrupted by the effects of shake-out events; consequently, it will demand internal transformations or adaptations. Crisis management literature pays attention to how organizations manage internal changes/adaptations/crises provoked by disruptions from external ones.

These arguments reveal the limited accumulation of knowledge about the link between the EU and shake-out events, as well as why it is important to understand organizational transformations due to disruptions observed in the development of the EU's core activities to respond to external shake-outs events.

## **4. Methodology**

### **4.1. Retrospective Case Study Approach**

We used a qualitative grounded theory methodology (Eisenhardt, 1989). Specifically, we designed a retrospective multiple-case study analysis type of longitudinal case design. All data, including first-person accounts, are collected when most of the events, activities, and outcomes under study have already occurred (Street and Ward, 2010). The criteria for selecting our research settings were based on previous studies. In particular, the EU must promote an entrepreneurial culture by

employing strategic actions to adapt to environmental changes (Guerrero et al., 2015). It must make self-instituted efforts to change its general character by strengthening its core activities (teaching, research, and entrepreneurial initiatives)<sup>2</sup>. Concretely, following Aguinis and Solarino's (2019) suggestions regarding transparency and replicability, we selected the twenty EUs in Chile (2), Colombia (1), Brazil (1), Germany (2), Mexico (2), Norway (2), Sweden (2), Spain (2), UAE (2), the UK (2) and US (2). By considering the EU's evolutionary perspective (Guerrero and Urbano, 2012), the selected universities vary into nascent (6), growth (10), and consolidated (2) levels of entrepreneurial orientation. The selected universities have relevant representativeness in business, STEM, and medicine fields. Indeed, these EU are listed in the top 15 Times Higher Education Regionals Ranking and recognized with a MOOC's trajectory.

#### **4.2. Data Collection**

Two steps have integrated the data collection.

**First step:** The research covers two COVID-19 pandemic waves from March 2020 to December 2020. The data-collection process adopts the triangulation suggested by Yin (2014) and Aguinis and Solarino (2019), with multiple sources to gather data, such as interviews and information from secondary sources, such as websites and official reports, and social media records. Having reviewed prior research, we designed a semi-structured interview protocol to explore key respondents' technological and emotional disruptions during the two COVID-19 pandemic waves.

We conducted semi-structured interviews via platform Zoom with ten male academics plus ten

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<sup>2</sup> The UK entrepreneurial universities have been listed in the Russell Group and generate strong socio-economic contributions (Guerrero et al., 2015). The North-American, European and Latin-American universities have been recognized as entrepreneurial in previous studies (Bernasconi, 2005; Guerrero and Urbano, 2012; Leih and Teece, 2016; Guerrero et al., 2021). Following the Aguinis and Solarino (2019) suggestions, we also used our personal contacts and knowledge to seek out universities that "self-identify" as EU, becoming increasingly common.

female academics enrolled in the business schools with various statuses (assistant, associate, and full professors) and different tasks/responsibilities (teaching, research, administrative, leadership, and decision-making) (see Appendix 1). On average, each one had two and a half hours, which was recorded and transcribed. This fieldwork was developed during the last quarter of 2020. Confidentiality agreements ensured that the identity of each participant was kept anonymous. Moreover, we complemented the analysis with data from reports, official documentation, and websites. The secondary information allowed us to reconstruct the participants' digital and emotional transformations (Yin, 2014)<sup>3</sup>.

**Second step:** The research covers the 2021 COVID-19 pandemic waves. Following a similar design to step 1, we designed a semi-structured interview protocol to explore key respondents involved in the EU strategic decisions related to technological and emotional disruptions during the COVID-19 pandemic. We conducted one and a half hours of semi-structured interviews via the platform Zoom with at least one university manager/leader per university. Given the difficulties of accessing some top university managers, we complemented interviews with “quotes” or “opinions” of the EU university managers captured in social media, university websites, and other public sources of information (see Appendix 2). Indeed, secondary information sources also help capture additional perceptions from the university community like students and stakeholders (e.g., Times Higher Education Ranking, QS COVID-19 survey, the UK National Students Surveys, UNESCO reports, OECD reports, and others). This fieldwork was developed during the third quarter of 2021. Confidentiality agreements ensured that the identity of each participant was kept anonymous<sup>4</sup>.

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<sup>3</sup> We have the representative quotes behind each codes but we did not include them for words limitations.

<sup>4</sup> We have the representative quotes behind each codes but we did not include them for words limitations.

### 3.3. Data Analysis

We processed the resulting interviews videos/text. We streamlined data collection to permit rapid analysis following the recommendations from Gioia et al. (2013) and Kuckertz et al. (2020). First, we employed open coding focused on the EU's core activities (teaching, research, and entrepreneurship) developed to respond to the stakeholders' COVID needs to build a comprehensive compendium of first-order categories (informant-centric). Second, we used axial second cycle coding to generate second-order (theory-centric) themes related to the EU's digital and emotional disruptions per core activity. Third, based on second-order themes, the coding team built theoretical dimensions resulting in the critical dynamics paths about the EU's identity metamorphosis (a simultaneous entrepreneurial, social and humanistic).

Based on the grounded theory, codes emerge without a predefined coding scheme (Bryant and Charmaz, 2007). The encoded data analysis involved searching for common patterns among interviews (Eisenhardt and Graebner 2007), then the identified patterns were saturated/framed/discussed based on the existing literature, strengthening the research's internal validity. The data structure model (Figures 1 and 2) shows the data development from interviews to codes<sup>5</sup>, themes, and dimensions that indicate theoretical implications stemming from the data structure. In doing so, we contribute to research at the interface of the EU, innovation, entrepreneurship, and crisis fields by providing a unique view just as the situation unfolds rather than after the event.

--- Insert Figure 1 and 2 here ----

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<sup>5</sup> See Appendix 3

## **4. Findings and Discussion**

### **4.1 The EU's technological disruptions to respond to the COVID-19 Pandemic**

#### **4.1.1 Teaching activities**

The EU adaptation to the digital economy<sup>6</sup> has produced several challenges in teaching-learning processes based on the re-configuration of technological/digital skills demanded by the labor market (Brynjolfsson and Kahin, 2002). In the context of the COVID-19 pandemic, our results show that from March 2020 to September 2021, the colleagues from developing economies' EU (Chile, Brazil, and Mexico) transited into a digital scenario without implementing a hybrid model for more than 69 weeks. In contrast, some interviewees from developed economies (Germany, Norway, Sweden, US, UK) were keen to keep going to the physical university and keep teaching in-person as much as possible. This hybrid model has depended on home-life and healthy circumstances across countries that experiment with a lockdown around 27 weeks. In this view, the EU's digital transformation has been part of a rapid and drastic teaching disruption (Agasisti and Soncin, 2021; Lee et al., 2021). Especially, social distancing COVID-19 restriction has represented a break from traditional established teaching-learning modes to radical technological teaching-learning disruptions characterized by an accelerated digitalization in an extremely short period (García-Morales et al., 2021). Therefore, given the pandemic circumstances, teaching in person was more acceptable for some colleagues (EU18a) who considered the teaching quality than others (EU05a). Although none of our interviewees reported that the technology/tools per se were

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<sup>6</sup> This external force has explained the rapid technological/digital teaching-learning advances such as e-learning programs, massive online open courses (MOOCs<sup>6</sup>), digital campuses that connect devices and virtual reality, telepresence education using artificial intelligence, as well as other technological disruptions developed by the EU (PWC, 2018; Guerrero et al., 2020). Although MOOCs are not the only strategy in the digital transformation of the EU, MOOCs have been considered the most significant technological advance of the millennium in the pedagogic part of higher education (Teece, 2018, p. 98).

a problem for them, the rapid transition into the full-digital scenario was especially uncertain for the waiting time to return to a “normal” scenario (EU03a, EU11a, EU13a, EU17a, EU19a). Especially for several female associate colleagues who reported struggling with the rapid training for delivering their online teaching more efficiently and university students’ engagement (EU02a, EU04a, EU06a).

Most of the analyzed universities have re-defined learning environments through digital platforms (e.g., ZOOM, Microsoft Teams, Google classrooms) and re-adjusting students’ engagement formulas with creative assessments (e.g., podcasts, videos, multiple apps, social media, virtual trips). According to our interviewees, the digital disruption allows all their colleagues to complement their online teaching using different communication platforms like e-mails, WhatsApp, streaming, and social media. Likewise, the pedagogical elements were critical in moving to an online teaching mode for all colleagues (e.g., adjusting contents, exams, final assignments, methodologies). Colleagues also recognized the benefits of online teaching. Still, the majority questioned the future of hybrid-modes post-COVID-19 pandemic, considering that some online teaching and administrative meetings should continue due to the ease with which people could attend. Along the COVID-19 teaching-learning process, most colleagues had already engaged with home/international students using multiple digital technologies in their courses, workshops, or long-life seminars. In this view, most of our interviewees did not report major difficulties in doing these teaching activities, apart from one who required very specific software to teach, which was only available on campus, thus causing problems in delivering their course (EU07a). Official reports provided by the QS COVID-19 survey have revealed some insights about the international students’ market preferences for in-person teaching programs and the delay in their mobility not only for the social distancing but also for the migratory barriers faced in many

countries. Likewise, the UK national students surveys have captured the un-balanced perception of students regarding the quality of online teaching according to the degree of entrepreneurship level among universities.

#### **4.1.2 Research activities**

The EU technological/digital disruptions are typically related to research outcomes more than knowledge generation modes. Our results show that female assistant/associate colleagues with a child less than 15 years old found it difficult to maintain their research productivity during the COVID-19 pandemic. Likewise, male colleagues with babies born during the pandemic were less productive during this period. Although the few disruptive technologies that have been slightly applied in research design as artificial intelligence, big data, e-cloud, platforms to test/experiment, and other digital tools (Nathan et al., 2016; Laurer and D'Agostino, 2013), in terms of digital disruption in their research activities, the majority of colleagues recognized that they have collaborated with multiple colleagues worldwide; therefore, they were very familiar with digital technologies like Zoom, Skype, Meet, Teams, and others. Just a few colleagues discovered several digital platforms or apps that help them conduct interactive experiments (EU15a), remote research (EU19a), big data, sentimental analysis (EU11a), geopositioning, or heat maps (EU01a). The rest of the colleagues researching via online interviews. As the EU09a describes, the digitalization of the qualitative research process has benefited from their ability to collect and speedily process data. Digital disruptions have facilitated the development of international collaborative projects among multiple scientists from research centers, labs, or schools worldwide (Paulus et al., 2017). Our results show that although the majority reported benefits of the widespread embracing of digital technology in their research activities (e.g., not having to travel to interviews and being able to complete them in a much shorter time), colleagues did not feel that the online and digital shift could

completely replicate or replace the in-person interactions that are a key part of their research process. It is important to highlight that not all colleagues conducted research related to the COVID-19 pandemic. A few colleagues applied digital technologies for developing COVID-19 pandemic research projects sponsored by diverse government agencies in the UK (EU09a), UAE (EU17a), and US (EU04a, EU19a). However, research activities have largely remained the same according to some respondents, albeit with research time severely squeezed to the point that it has been largely on hold for most colleagues.

In Europe, anecdotal evidence has shown the effects of financial crises in reducing science budgets and strong academic participation in the reconstruction periods (Carayannis and Campbell, 2010; Carayannis and Rakhmatullin, 2014). Likewise, the developed economies colleagues highlighted some affectations in the lockdown regarding their tenure evaluations and the negative effects on networking and grants for non-attending conferences in person for more than 18 months. The most updated statistics about research are still ambiguous in capturing the pandemic's positive or negative effect on research indicators like academic publications, research grants, or commercialization of discoveries. Consequently, the social distance restrictions during the COVID-19 pandemic have considerably affected the research and commercialization of scientific workplaces in fields do not strongly related to the coronavirus (Siegel and Guerrero, 2021). Although the real effects would be observed in future statistics, the preliminary evidence suggests that the EU has proactively executed digital/technological disruptions to support the scientific community during the COVID-19 pandemic.

#### **4.1.3 Business engagement**

Since its conception, the EU has been considered an eco-system that provides multiple infrastructures and support programs to foster innovation and entrepreneurship in its community (Guerrero and Urbano, 2012), as well as recently has implemented numerous digital platforms that connect multiple eco-systems agents (Sussan and Acs, 2017). In this regard, during the COVID-19 pandemic, our results show that the online mode of delivery was much better for colleagues involved with the external stakeholders regarding the attendance of people who had to fit their participation around the working day (EU18a, EU20a). Several colleagues also recognized that their university digital platforms provided free mentoring with business owners, SMEs, graduates' entrepreneurs, and academic entrepreneurs during the COVID-19 pandemic (e.g., SOS apps). Other colleagues combined teaching activities and supported the local business COVID-19 pandemic challenges through final assignments and virtual students' practices (EU02a, EU03a, EU11a, EU13a, EU16a). Indeed, almost all interviewees were involved in specialized webinars, online university-industry debates, or online symposiums to be rapidly connected with their stakeholders' needs. In this vein, the EU has continued developing digital/technological infrastructures to support their entrepreneurial community (students, alumni, researchers) and business engagement activities during the COVID-19 pandemic.

Technological disruptions are also part of the (digital) entrepreneurship phenomenon evolution (Nabisan, 2017) and were strongly related to providing solutions to the global health crisis provoked by the COVID-19 pandemic. In this regard, all colleagues enrolled in EU with health schools have highlighted the health faculty's outstanding participation with local agents to support the COVID-19 stakeholders' needs (EU04a, EU11a, EU19a). Especially in the Latin-American context, the EU has actively participated with local governments to define the COVID-19 pandemic protocols (e.g., Brazil, Colombia, Chile, Mexico) while in the EU allocated in developed

economies actively participated in testing and other vaccination schemes. Indeed, all EUs prioritized their R&D resources and technological capabilities for developing vaccine tests (EU02a), treatments (EU15a, EU19a), medical equipment (EU11a), and others. It means that academic entrepreneurship and commercialization activities were basically focused on achieving the COVID-19 pandemic stakeholders' needs, conditioning the future of non-COVID-19 pandemic research projects. These results demonstrate that the EU entrepreneurial community actively generates new technological/digital disruptions associated with coronavirus' PCR testing, vaccines, medical equipment, sanitization products, and other initiatives to support civil people. Indeed, the most plausible collaboration example between the university-industry was the Oxford University and AstraZeneca alliance for developing the COVID-19 vaccine (Siegel and Guerrero, 2021).

While the technological disruption was reported as fairly easy to use in business engagement activities, the other aspects of shifting to full online activities were challenging for the university community, especially those who were not digital-oriented. Today's EU very much inhabits a digital space and way of doing all core activities. This means that going forwards, in terms of the previously established importance of local spillovers, proximity, and tacit knowledge that can only be shared "in-person" is unclear. Perhaps given technological disruptions, we will see geography and proximity decreasing in importance if digital technologies become entrenched within the daily work of the EU in research, teaching, and business engagement or research commercialization. Interestingly, the most updated Times Higher Education ranking has revealed that the analyzed EU have improved their legitimize and positioning in the global scope during the pandemic. Concretely, the most improved indicators were related to research and diversified funds related to their medical schools as well as the interaction with stakeholders' satisfaction.

## **4.2 The EU's emotional disruptions in responding to the COVID-19 Pandemic**

### **4.2.1 Emotions related to the EU teaching core activities**

Emotions have been one of the most neglected dimensions of educational change because they are often treated as rational, cognitive processes to pursue rational, cognitive ends (Hargreaves, 2005); therefore, teachers' and students' emotions are relevant along the teaching-learning process (Sutton and Wheatley, 2003; Agasisti and Soncin, 2021). For instance, due to the COVID-19 pandemic, along with balancing EU activities and personal life, colleagues recognized that their emotions flowed as a "roller-coaster" (EU02a, EU08a) and with concrete "peaks and troughs" (EU05a) across the COVID-19 pandemic waves. At the beginning of social distance restrictions, several colleagues highlighted positive feelings reflected for improving work-life balance (e.g., reducing mobility from one city to another, spending more time with the babies born during the pandemic, or the opportunity to become more productive in research), but emotions changed as progressed the spread of the coronavirus. Although the majority identified themselves as resilient people, the feelings became more negative for the participants as the pandemic stretched on.

The second wave hit with new lockdowns and restrictions, summarized by the EU08a. Indeed, for those who only have developed online teaching, their emotions were strongly influenced by their students' emotions and demands (e.g., worried about their mental health problems or their effective learning process) and by their family members' demands and health (e.g., partners who tested positive in COVID-19, caring responsibilities or kids that demanded more time/support in their home-schooling processes), and the accumulated digital fatigue (e.g., many hours in front of a computer without physical activity or work pressures). Tiredness was strongly related to negative emotions such as anxiety, stress, fear, frustration, and many concerns amongst (female) colleagues

living the global pandemic. This mentioned duty of care is vital to follow-up because all of our respondents experienced this one way or another, adjusting their work, taking on additional responsibilities, and making extra efforts to enact care and compassion for colleagues, students, and junior staff. In the Latin-American context, several students are from vulnerable rural areas and suspended their studies to help their parents that lost their jobs due to the COVID-19 pandemic (EU03a, EU13a, EU14a). In the developed economies, all analyzed EU also implemented several initiatives to support their student community with 24hrs mental health specialized attention and extra facilities for achieving the semester tasks. Indeed, several colleagues experienced very positive feedback and gratitude expressions from their students at the end of both semesters (EU02a, EU10a, EU11a, EU19a).

Results reveal insights about an emotional COVID-19 disruption within the higher education teaching-learning environment due to profound emotional shifts in both teachers and students. For teachers, it represented a challenging emotional period considering that not all EU have not entirely acted with solidarity to their temporary teaching staff (e.g., reduced income via lower student numbers) or sympathetic with students or staff (e.g., profit-driven behavior or those who continue their work in difficult conditions). For students, the COVID-19 pandemic also represented a challenging time in maintaining mental and physical health. According to Tasso et al. (2021, p. 9), university students have been the most affected by COVID-19 on several levels, including fear of themselves or others in their social network contracting the virus, apprehension about the changes in coursework delivery, and unclear instructional parameters, overall loneliness, compromised motivation, and sleep disturbances, as well as anxious and depressive symptoms. Therefore, we assume that the EU has been proactive in taking care of emotions, especially those related to

students' mental health problems (e.g., anxiety, depression, stress, digital fatigue) during the COVID-19 pandemic.

#### **4.2.2 Emotional connections with research and entrepreneurial engagement**

Emotions have also been part of innovation processes (Goss, 2005; Vuori and Huy, 2016) and entrepreneurial processes (Foo, 2011; Cardon et al., 2012). During the COVID-19 pandemic, all colleagues reported empathy and gratitude for how their EU rapidly stepped in to fulfill their region's needs via setting up testing centers, producing hand sanitizer in the laboratories, and using 3D printers to make protective masks for healthcare workers. In this scenario, several of our respondents directly faced emotional concerns related to employees' health/well-being working with local businesses (EU03a, EU11a) and mixed-emotions corresponding to anxiety/stress as well as confidence/optimism from policy communities in the way to respond to civil society's pandemic era needs (EU15a). Indeed, colleagues conducted research and fed it directly back to policymakers and decision-makers in their regions (EU7a). In emerging economies, the EU's researchers usually pay attention to the stakeholders' needs by developing frugal social technologies/innovations (Zietsma and Toubiana, 2019; Fischer et al., 2020). Given the unexpected events and nature of the COVID-19 pandemic, the EU has been very proactive with multiple agents by prioritizing the related COVID-19 technology transfer and commercialization (Siegel and Guerrero, 2021).

The COVID-19 pandemic has intrinsically multiple emotions in many entrepreneurs who have experimented with concern about their employees' health and well-being and anxiety about their business's future. Some colleagues were involved in programs to support their local businesses with training and professional development to help create resilient and sustainable businesses through and beyond the pandemic. In this scenario, emotions also emerged when they were in touch

with vulnerable regional communities from rural areas in Mexico (EU03a) or the Amazonian regions of Brazil (EU13a). Online networking/mentoring proved popular for some colleagues who experienced very high sign-up rates where many local businesses were interested in taking part, given the positive results on managing challenges and emotional empathy (EU02a, EU03a, EU08a, EU11a). The EU has been very empathic and proactive in supporting its students/academic start-ups but also local entrepreneurs. Specifically, all colleagues experienced emotional needs/demands during their engagement with business school activities during the pandemic, suggesting that the third core EUs' actions became more important and emotional during this time. The most interesting issue was the trust that interviewees expressed to their EU for the agile response and protecting the well-being of the university community and the stakeholders. Indeed, colleagues highlighted how the EU is paying attention to preserving diversity, equality, sustainability, and integrity of the entire university community.

At the research level, all respondents expressed several emotional constraints related to their research productivity by the limited time and digital fatigue. It is worth noting here that there have been discussions taking place in the inequalities emerging in productivity during the COVID-19 pandemic period, with journal editors reporting higher submissions from male academics and lower ones from female academics, with higher caring responsibilities at this time (Viglione, 2020). Here, the EU experimented with an emotional metamorphosis by dealing with their research activities. Likewise, the EU has also stepped up and delivered very specific pandemic-related to take care of their local populations more broadly. In this view, the EU has become a more “caring university” during the COVID-19 pandemic moment by enacting perseverance and resilience in their stakeholders. In this vein, the EU experimented with an emotional metamorphosis by dealing with their business engagement activities.

### **4.3 The EU's metamorphosis influenced by the COVID-19 disruptions**

#### **4.3.1 EU structural changes**

All EU interviewed leadership has recognized a massive disruption derived from the COVID-19 pandemic that has reinforced their primary focus: the student's engagement providing quality education, novel hybrid teaching methodologies, and ensuring security and well-being in the entire university community. Indeed, students and society have stated the emergence of new EU business models that consider a global personalized consumer-based perspective aligned with social value creation, impacts, and returns. It is expected that this hybrid business model pattern will be maintained in the following years to reduce financial fragility during uncertain times and also increase partnerships with big digital companies, especially in training and long-life learning programs.

Likewise, more internally, the most critical structural challenge due to the technological disruption was home living/working arrangements during the pandemic restrictions. Here, the biggest structural change reinforced open, inclusive, and diversity schemes during the hybrid modes. Generally, academics perceived strong support given their EU's proactive ways of responding to the COVID-19 pandemic in the shift to online working and managing increased workloads. Some departments offer "well-being days" (EU02a, EU18a). The EU's structural metamorphosis was impregnated by the student's engagement, new business models, remote work, and efforts to respond to the stakeholders' needs.

Given the digital and emotional disruption provoked by the COVID-19 pandemic, the analyzed EU experimented with a structural metamorphosis by re-configuring workplaces through flexible, hybrid, and digital scenarios, as well as incorporating a humanistic leadership perspective by

providing well-being and inclusive scenarios for all university communities to support/respond to the needs of local businesses, policymakers, and local communities during the COVID-19 pandemic. Consequently, the EU organizational structures have been lightly transformed into an adaptative and pro-equality leadership, a diversified global business model, sustainable development, and new scientific commercialization processes (Laffineur et al., 2020; Siegel and Guerrero, 2021; Purcel and Lumbreras, 2021).

#### **4.3.2 EU identity changes**

The EU leaders have recognized the reinforcement of the entrepreneurial and social identity due to the university disruptions faced to respond to the stakeholders' needs during the pandemic. At the same time, the EU leaders have evidenced a humanistic tendency for protecting dignity, health, and well-being during the COVID-19 pandemic. Based on these insights, during the pandemic, EU leadership has simultaneously adopted an entrepreneurial mind-set through the multiple initiatives with social value creation based on agile response to stakeholders' needs without forgetting to protect the university community's well-being. Although equality/diversity is still a big challenge inside many universities, the relevance of promoting these identities demand the fostering of this culture via teaching, research, and business engagement activities. It requires the reinforcement of transparency, commitment, organizational culture, and openness.

During the COVID-19 pandemic, the EU reinforced its entrepreneurial identity by adopting risk-taking, proactiveness, and innovativeness orientations to develop all core activities (Guerrero and Urbano, 2012), as well as its social identity by adopting a human social-cognitive orientation in developing all core activities (Fini et al., 2018) through engagement with the university community and local business communities (Zhou and Tang, 2020; Loi and Fayolle, 2021; Thomas et al.,

2020). Therefore, the EU's identity metamorphosis was impregnated by a simultaneous entrepreneurial and social identity that supported the emergence of the humanistic identity. The technological and emotional disruptions have provoked a re-configuration in the EU identity towards a simultaneous entrepreneurial, social, and humanistic orientation. The humanistic identity emerged by adopting a psychological and emotional growth orientation in developing all core activities (Goldstein, 1986). The EU care work is overlooked or under-valued in the academic setting (Smyth et al., 2020). Care factors have notably intensified among the EU community to deal with their colleagues, students, and partners outside the university. Especially, based on the COVID-19 emotional and healthy protection orientation (Pirson, 2017), the configuration of an EU's humanistic identity could be characterized by a relational and collectivistic supportiveness culture among the university community, stakeholders, and society (Brickson, 2007).

#### **4.4 Proposed theoretical model**

Given the nature of the analyzed shake-out event (COVID-19 pandemic), we identified two avenues of “disruption” within the EU through teaching, research, and business engagement activities in responding to their stakeholders' needs. First, *technological/digital disruptions* are referred to as radical digital innovations and their wider systemic effects. This concept is framed as a type of environmental turbulence introduced by digital innovations that erode boundaries and approaches that previously served as foundations for organizing the production and capturing value (Skog et al., 2018, p. 431). The EU has adopted an entrepreneurial orientation to transform old routines into new ones in their core activities (Teece, 2012, 2018). During a global pandemic characterized by social distance restrictions and unique stakeholders needs, technology played a disruptive role in developing the EU core activities to satisfy the needs of the university community (students, teachers, researchers, entrepreneurs) and local community (society, local business,

government, eco-system agents). Second, *emotional<sup>7</sup> disruptions* are referred to as initiatives and actions that have been enacted to help staff deal with these multiple pressures, such as mentorship, friendship and support, positive citation practices, collective writing, and “slow scholarship” as a few examples (Mountz et al., 2015; Bain et al., 2017; Mott and Cockayne, 2017; Bayfield et al., 2020). However, emotions have been studied in innovation and entrepreneurship studies (Lawless, 2018; Cardon et al., 2012), but these insights have yet to be holistically incorporated into the EU literature. Due to the emotional component within a global health crisis, positive/negative emotions played a disruptive role in managing human relationships and developing the core entrepreneurial university activities.

By considering “technological and emotional disruptions” as mechanisms that stimulated organizational transformations due to the effects of an external event, in our study, we identified two relevant metamorphoses experimented with within the analyzed universities. First, *structural changes*, the EU pre-COVID structures were characterized by proactive/entrepreneurial oriented leaders towards global educational megatrends (Davies et al., 2001; Eddy and VanDerLinden, 2006; McRoy and Gibbs, 2009), financial challenges, infrastructures (Guerrero and Urbano, 2012), intrapreneurial dynamic capabilities (Guerrero et al., 2021; Stolze and Sailer, 2021), knowledge transfer, internationalization mobility and initial sustainability (Siegel and Guerrero, 2021; Purcel and Lumbreras, 2021). We assume that COVID-19 has demanded new and rapid organizational strategies, vision, and leadership to respond to stakeholders’ needs. Second, *identity re-configuration*, the EU pre-COVID identity was mainly characterized by a hybrid entrepreneurial identity with an economic orientation (Berenitz and Feldman, 2012; Audretsch, 2014; Guerrero et

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<sup>7</sup> Multi-faceted discussions of emotions and contemporary pressures within contemporary universities have emerged during the last decade (Moss-Racusina et al., 2012; Maddrell et al., 2016; Ahmed, 2017; Tolia-Kelly, 2017).

al., 2015; Thomas and Pugh, 2020) and a social orientation (Benneworth and Cunha, 2015; Pugh et al., 2018). We assume that COVID-19 has influenced the university's identity by adapting its values, visions, and strategies to respond to stakeholders' needs.

Based on previous arguments, Figure 3 illustrates the proposed theoretical framework that provides a better understanding of how organizational strategic responses to stakeholders needs to be derived from shake-out events or external crisis (e.g., the COVID-19 pandemic) implicitly generate disruptions (e.g., technological, social and emotional – P1) that (in)directly will be the initially triggered mechanisms that conduct towards an internal organizational metamorphosis (e.g., structural and identity changes – P2). It is important to highlight that the intensity of the triggered mechanisms (disruptive technological and emotional) on the EU metamorphosis (structural changes and identity changes) could vary depending on the interplay among organizational entrepreneurial evolutionary stages, socio-economic conditions per country, as well as unique effects produced by the shake-out events per country.

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## **5. Conclusions**

### **5.1 General conclusions**

This study aimed to theories the EU's metamorphosis due to technological/emotional disruptions to respond to evolving COVID-19 stakeholders' needs. Based on diverse sources of information from twenty well-representative EU worldwide, four main conclusions have emerged from the findings. First, the COVID-19 stakeholders' needs demanded a critical, agile, and proactive response of the EU by incorporating technological/emotional disruptions that re-oriented the core activity (teaching, research, and business engagement). Second, the COVID-19 pandemic re-legitimized the impact of the EU's entrepreneurial and social identities on societal value creation.

Third, the COVID-19 pandemic re-stimulated an EU's structural metamorphosis based on the hybrid business models thinking on personalized students' needs and the implementation of hybrid workplaces. Fourth, the COVID-19 pandemic re-activated an EU's humanistic identity metamorphosis where the leadership takes care of diversity, equality, and well-being culture inside and outside the university. Finally, the COVID-19 provided a tentative pathway that could adopt the EU to manage/respond to another shake-out event.

## **5.2 Academic contributions**

The proposed theoretical framework contributes to the two academic debates highlighted in our introduction. *The first gap was related to the EU's response to stakeholders' needs during shake-out events.* By considering stakeholders, digital and emotional disruptions approaches, previous anecdotal evidence regarding universities' response during shake-out events has been debated among policy-makers post the 2008 financial crisis (Carayannis and Campbell, 2010; Guerrero and Urbano, 2019; Zhang et al., 2019; Eringfeld, 2020). This study contributes to the existing academic literature by extending the understanding of the technological and emotional disruptions promoted by twenty entrepreneurial universities allocated in different higher education systems and socio-economic realities to satisfy their stakeholders' needs in the pandemic via hybrid teaching, via pro-COVID19 research discoveries, and supports via business engagement activities. *The second gap was related to the EU's metamorphosis derived from shake-outs.* By considering organizational identity, organizational metamorphosis, and humanistic management approaches, very few previous studies have linked technological/emotional disruptions, organizational metamorphosis, and external shake-outs (Starbuck, 1967; Guerrero et al., 2016; Utescheva et al., 2016; Purcell and Lumbreras, 2021). This study extends the academic literature by providing insights into the EU structural and identity metamorphoses derived from implementing technological/emotional

disruptions to respond to shake-out events. Especially by highlighting the critical role of the EU leadership (Stolze and Sailer, 2021) and re-configuration of the EU's identity pro-market (Li and Tang, 2021), pro-social (Fischer et al., 2020), and humanistic (Pirson, 2017). Particularly, this study recognize for the first time the critical play of emotions (sympathy-empathy, anxiety, dynamic masking, and mental health issues) within the academic sphere during a “shock” period by extending the debate of previous studies in the organizational management literature (Shaw and Ward, 2014; Bain et al., 2017; Berg et al., 2016; Lawless, 2018). It extends the idea that the EU identity should include the “care or humanistic” perspective that has been overlooked in the existent entrepreneurial literature.

### **5.3 Limitations and future research**

This study also has some limitations that at the same time open up avenues for future research. First, we awarded a selection bias issue in our methodology that led to us having interviewed those who are naturally more comfortable with Zoom and online interactions, probably excluding those colleagues uncomfortable with the digital tools. It demands robust methodological (digital) methods for reducing selection bias in future studies. A natural extension of this study will include participants from different university departments and schools to evaluate particularities between business, medical, and STEM participants. Second, we had representative EU academic/leaders participants per gender, academic status, and regional presence. This study contains some insights related to the participants' profiles, but potential similitudes/differences among participants and their EU responses should be exploited in-depth in future studies. An additional extension will be considering these profiles with the entrepreneurial evolutionary stages across the analyzed universities. For instance, we have details about each entrepreneurial university's nascent, growth, and consolidated stage. However, we did not find differences among the themes analyzed in this

study. Future studies should consider universities' dynamic and evolutionary cycles and local ecosystems capacities. Third, our study focused on three academic debates related to the lack of studies about the impact of exogenous shake-out events on how the EU responds to stakeholders' needs and how the EU manages digital and emotional disruptions. Given the complex nature of the phenomenon, future studies should adopt multidisciplinary lenses (e.g., economic, technological, psychological, sociological, institutional) for re-conceptualization of the EU identity (Guerrero and Urbano, 2019) and re-thinking of the university-industry-government-society relationships (Rajalo and Vadi, 2017). Indeed, the disruptive and transformation intensity could vary across organizations, countries, and types of shake-out events. Fourth, the EU would face multiple managerial challenges in the post-pandemic era related to financial difficulties (e.g., unexpected costs, uncertain budgets, students financial aid), admission and enrolment challenges (e.g., students abroad and international students), students support challenges (e.g., mental health problems, campus housing), and R&D commercialization challenges (e.g., rescuing non-COVID-19 pandemic research projects, patents, licenses). Given the purpose and data limitation, future studies should also pay attention to the EU strategic management post-pandemic. Concretely, to test our proposed model to identify new trigger disruptive mechanisms and organizational transformations that could emerge during the recovery period. Fifth, we interviewed several university managers to understand their perspectives about the EU structural and identity metamorphosis. However, we did not exploit the specific challenges or leadership styles that emerged during their management of the COVID-19 pandemic. An extension of this study will focus on the EU leadership and management of internal crises generated by external ones. For instance, leadership behaviors and emotions are crucial while managing external and internal crises; therefore, it is another research line that emerges from this study. Finally, we have implemented a qualitative methodological design that allows an in-depth understanding of the analyzed phenomenon (Gioia et al., 2013;

Aguinis and Solarino, 2019; Dodd et al., 2020; Van Burg et al., 2020). However, this methodology has restrictions in terms of generalization but allows it to be replicated in other research settings or build a qualitative instrument to explore potential relationships among the analyzed dimensions. A natural extension of this study is testing, qualitatively or quantitatively, our proposed theoretical framework in another recent shake-out event (e.g., natural disasters, crises, war, or post-conflict scenarios) where the technological and emotional disruption could play a critical role in the adaptation of EU core activities to the new stakeholders' needs; consequently, identify similar trigger mechanisms or new pathways that intensify the EU's metamorphosis during and after any external shake-out event. For instance, the Ukrainian and Russian conflict represents another shake-out event facing the university community with unique restrictions, particular penalties, inherent risks, and multiple societal consequences. The EU of these countries is rapidly responding to these uncertain conditions that also need to be documented in the near future.

#### **5.4 Stakeholders implications**

Several practical implications emerged from this study. First, for policymakers, the positive message of the COVID-19 pandemic is that it has pushed the EU to assist the socio-economic development of their regions by developing a sustainable and resilient model (Lamine et al., 2018; Fischer et al., 2020). Indeed, it further embedded the EU roles as anchoring and engaging actors in contemporary society (Audretsch, 2014; Guerrero and Urbano, 2019). It legitimizes the contribution of the EU to provide some innovative solutions to the big societal challenges, as well as how policymakers could incentivize open innovation business model practices among multiple local and international actors to achieve co-creative solutions to societal problematics. Second, going forwards for university managers, our results showed how these digital and emotional disruptions. We have noticed that would embed, reverse, or evolve further post-COVID-19

pandemic. It also shows how the EU managers had responded to an exogenous event. Therefore, these learning experiences could be helpful for similar events. Indeed, the COVID-19 pandemic has also opened a black box related to sensible and urgent health issues (e.g., mental health) within the university community, as well as the multiple disadvantages of minorities that have seen affected their labor productivity within the university. It demands more attention to emotions and equality conditions along with the university community. Third, for academics/researchers, the EU's experience as a digital workplace opens a debate about the continuity/establishment of hybrid modes, flexible time allocation for working at home, and digital platforms supporting local businesses (Nabisan, 2017; Sussan and Acs, 2017). Indeed, it also re-activates the debate about more scientific workplaces' inclusivity, diversity, well-being, and new productivity metrics (Siegel and Guerrero, 2021). It provides insights into how others colleagues have managed their daily roles during an internal organizational transformation derived from the effects of external crises. Four, for higher education agents, a balanced entrepreneurial, social and humanistic EU identity represents how organizations transform external challenges into opportunities (Yang and Huang, 2020; Guerrero et al., 2021). EU managers should consider emotions and humanistic views as drivers' rationale for overhanging everything within the EU. Finally, this study legitimizes the relevant role of EU pre, during, and post-shake-out events for all stakeholders. Indeed, several learning lessons could be applied. Pre-shake-out events, the empirical evidence has shown that the EU is one of the key contributors to socio-economic development and societal challenges via their core activities (Guerrero et al., 2015; Sussan and Acs, 2017; Fischer et al., 2020). During shake-out events, the empirical evidence has shown how the EU proactively participates in providing a rapid and effective response to the new societal challenges like the COVID-19 pandemic (Siegel and Guerrero, 2021). In the post-shake-out event, the EU has been a key actor in reconstructing

post-conflict scenarios (Barbara and Walsh, 2018). Therefore, it is important to recognize the strategic EU internal transformation in each scenario.

## **5.5 Scholarly implications**

In our role as social science researchers and members of the university community, we hope this research stimulates scholars from different social science fields to re-think more broadly about the opportunities for making an impact with our research focus on entrepreneurial universities. We believe it is the perfect time to “make a difference” through our research, teaching, and interaction with multiple socio-economic agents to constitute impacts that “endorse a real and sustained transformation” of our communities. We hope this research stimulates the start of a provocative debate in numerous private/public arenas regarding at least four critical challenges higher education systems face. First, this great higher education technological disruption should indisputably help re-define hybrid competency-based education models to generate value for learners via cost-effective degrees options, employers fill their business needs, and socio-economic growth. Most university students have been born in the digital era and, therefore, demand more technological teaching-learning engagement. This is especially after a pandemic that has opened a digital window for many students who prefer online courses instead of presential ones. Indeed, the problematic issue that technological disruption has also evidenced is some teachers groups’ limited technological abilities/skills or digital aversion, as well as health problems that affect the learning-teaching environment. Therefore, it is urgent to re-define new business teaching models as well as improve teachers’ technological skills. Second, this great higher education emotional disruption should indisputably help protect professional dignity via equality, diversity, and well-being conditions without distinction per gender, race, sex, and religion. Most universities have these human resources issues on paper, but the execution is still very different from expected. Indeed, it

is still critical to observe the gender gap in income, narcissistic leadership roles, and discrimination in promotion opportunities in many faculties, departments, and universities worldwide. Third, the higher education organizations should review the scholarly impact criteria for accrediting and evaluating the university production by legitimizing the university community's contribution and returns to society. Indeed, minority groups are still facing the affectation of the COVID-19 pandemic in their research productivity and academic promotions (e.g., female/male parents, early-stage researchers). It is time that higher education systems reconsider the evaluation criteria and consider other indicators such as the impacts generated in local communities. Fourth, the rapid co-creation experiences between stakeholders, the university community, and eco-system agents without enough bureaucracy during the pandemic should help recognize the importance of time, costs, and effectiveness. The global learning from the COVID-19 pandemic has been human and organizational fragility. It is important to re-consider the debate about the democratization of the science for solving societal challenges. For instance, during the pandemic, many universities signed an agreement regarding the reduce bureaucratic barriers in the use of their intellectual property with healthy purposes.

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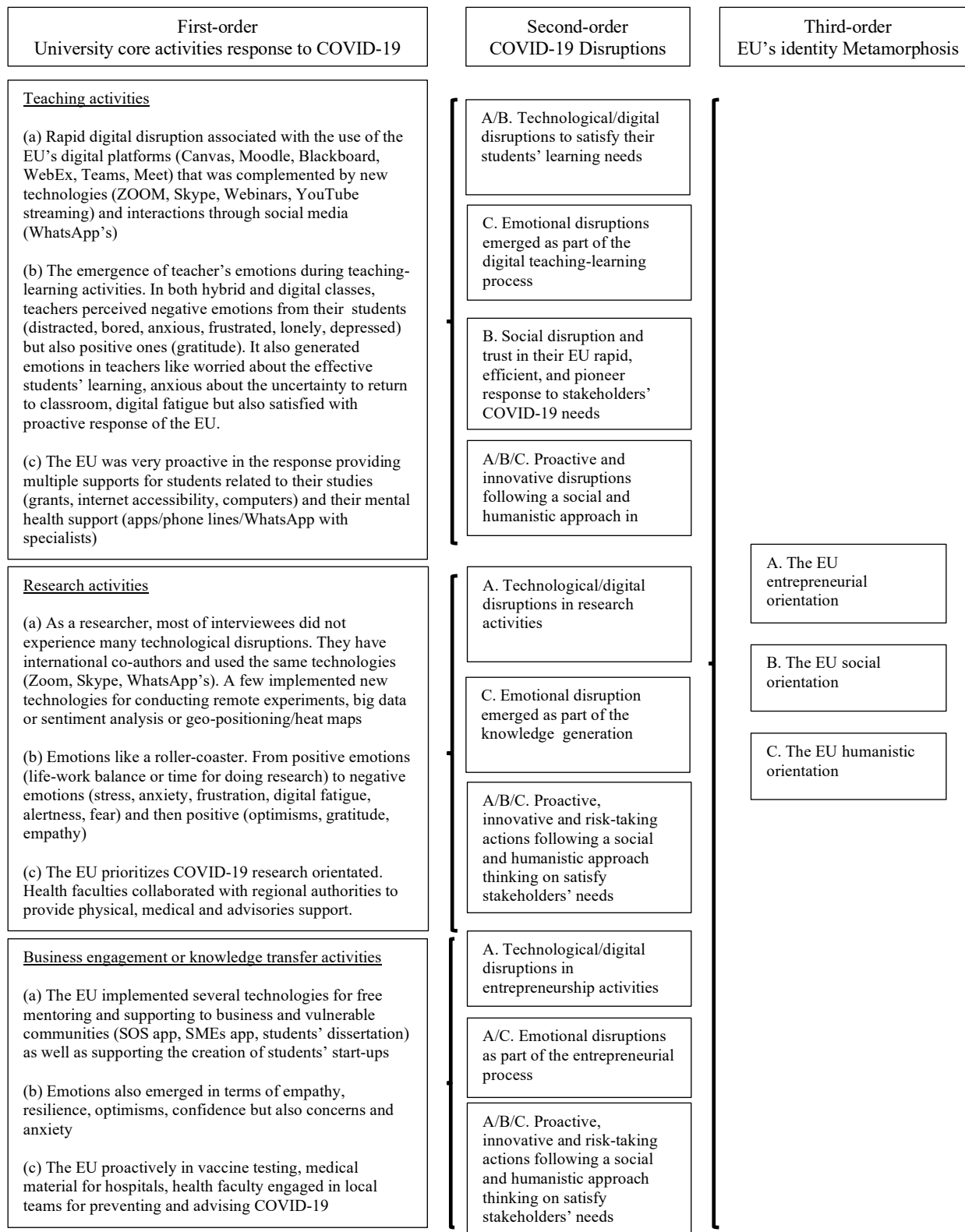
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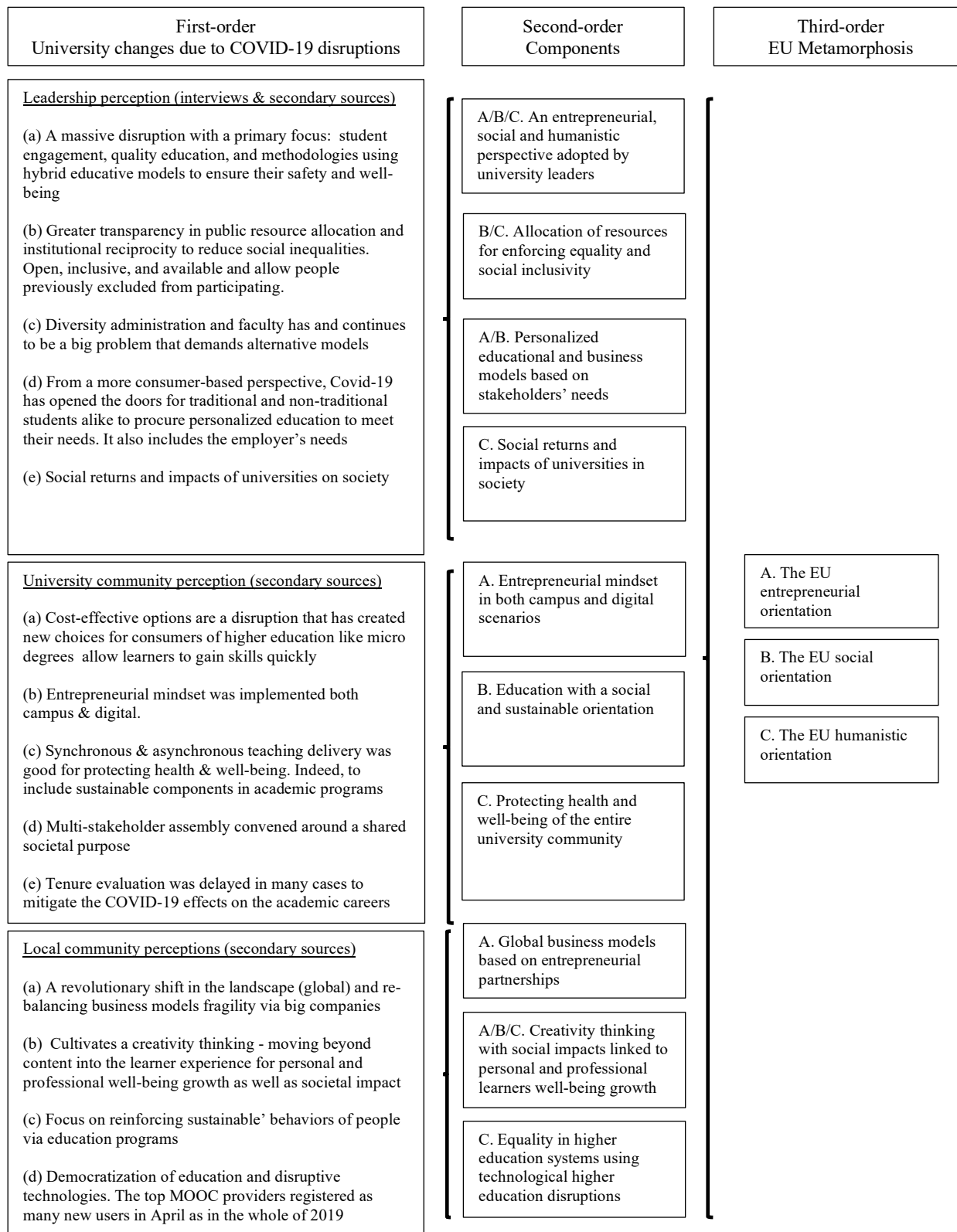
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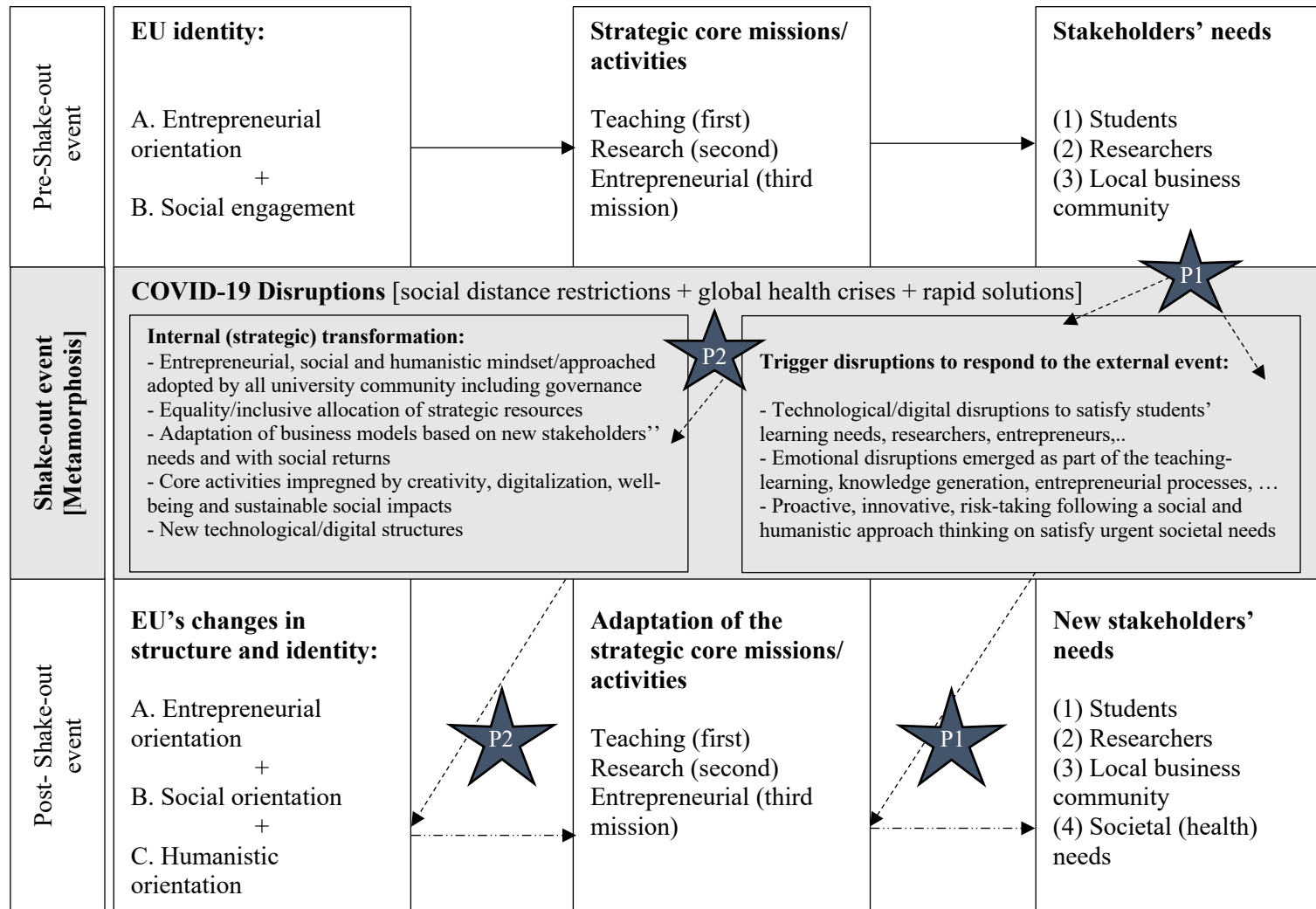
**Figure 1: EU response to COVID-19, disruptions and impacting on identity metamorphosis (step 1)**

Source: Authors



**Figure 2: EU's identity metamorphosis influenced by the COVID-19 technological and emotional disruptions (step 2)**

Source: Authors



Notes:

P1= Trigger technological, social and emotional disruptions to respond to the external event

P2= The internal (strategic) structural and identity transformations due to trigger disruptions to respond to the external event

**Figure 3: Proposed theoretical framework**

Source: Authors

Appendix 1: Participants (Step 1)

ID	Academic status	Gender	Kids with less than 15 years old	Baby	Resilient by self-definition	Hybrid		Academic field	Country
						Wave 1	Wave 2		
EU01a	Assistant	Male	Yes	Yes	Yes	Yes	No	Entrepreneurship	Sweden
EU02a	Assistant	Female	Yes	No	Yes	No	No	Entrepreneurship	Mexico
EU03a	Assistant	Male	Yes	No	Yes	No	No	Business Economics	Mexico
EU04a	Assistant	Female	No	No	Yes	Yes	No	Entrepreneurship	US
EU05a	Assistant	Male	Yes	No	Yes	Yes	No	Entrepreneurship	Norway
EU06a	Assistant	Female	Yes	Yes	Yes	No	No	Entrepreneurship	UAE
EU07a	Assistant	Male	Yes	No	Yes	Yes	No	Entrepreneurship	Germany
EU08a	Associate	Female	Yes	Yes	Yes	Yes	No	Entrepreneurship	UK
EU09a	Associate	Male	Yes	No	Yes	Yes	No	Entrepreneurship	UK
EU10a	Associate	Female	Yes	No	Yes	No	Yes	Business Economics	Spain
EU11a	Associate	Male	No	No	Yes	No	Yes	Business Economics	Spain
EU12a	Associate	Female	Yes	No	Yes	Yes	No	Business Economics	Chile
EU13a	Associate	Male	Yes	Yes	Yes	No	No	Entrepreneurship	Brazil
EU14a	Professor	Female	No	No	Yes	No	No	Entrepreneurship	Colombia
EU15a	Professor	Male	Yes	No	Yes	Yes	No	Business Economics	Chile
EU16a	Professor	Female	No	No	Yes	Yes	No	Entrepreneurship	Germany
EU17a	Professor	Male	Yes	Yes	Yes	No	No	Entrepreneurship	UAE
EU18a	Professor	Female	Yes	No	Yes	Yes	No	Entrepreneurship	Sweden
EU19a	Professor	Male	No	No	Yes	Yes	No	Entrepreneurship	US
EU20a	Professor	Female	No	No	Yes	Yes	No	Entrepreneurship	Norway

## Appendix 2: Participants (Step 2)

ID	Leadership role	EU level	Gender	Interview	Secondary data	MOOCs experience	Entrepreneurial orientation	Social orientation	Humanistic orientation	Medicine field	STEM fields	Country
EU01b	Dean	Growth	Male	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Sweden
EU02b	Dean	Nascent	Female	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Mexico
EU03b	Dean	Nascent	Male	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Mexico
EU04b	University President	Consolidated	Male	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	US
EU05b	Dean	Growth	Male	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Norway
EU06b	Dean	Nascent	Female	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	UAE
EU07b	Associate Dean	Growth	Male	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Germany
EU08b	Associate Dean	Growth	Female	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	UK
EU09b	Associate Dean	Growth	Male	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	UK
EU10b	Dean	Growth	Female	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Spain
EU11b	Dean	Growth	Male	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Spain
EU12b	Dean	Nascent	Female	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Chile
EU13b	Dean	Nascent	Male	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Brazil
EU14b	Dean	Nascent	Female	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Colombia
EU15b	Dean	Nascent	Male	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Chile
EU16b	Associate Dean	Nascent	Female	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Germany
EU17b	Dean	Nascent	Male	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	UAE
EU18b	Dean	Growth	Female	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Sweden
EU19b	Pro-Vice-Chancellor	Consolidated	Male	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	US
EU20b	Dean	Growth	Female	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Norway

### Appendix 3: Codes

Emotional disruptions			Digital disruptions			EU metamorphosis		
Students	Academics	Entrepreneurs	Teaching	Research	Engagement	Entrepreneurial	Social	Humanistic
Distracted	Frustration due to admin meetings (time-consuming)	Empathy	Own University-Learning Management System (CANVAS, MOODLE, BLACKBOARD, TEAMS)	Zoom/ Cisco WebEx/ Google Meet/ Skype / Teams	SOS app - free mentoring, training, and consultancy	The entrepreneurial mind-set continues in the university community	Societies needs are part of the university priorities	Emotions now are intrinsically part of the core activities
Bored	Anxious due the life-work unbalance (family demands time but work too)	Resilient	Google Classroom	Webinars / TV channels	SMEs app - free mentoring vulnerable entrepreneurs communities (rural, women, social)	Engaging students to develop start-ups projects	Scholarly impact on vulnerable communities (rural, migrants, ...)	Empathy, resilience, ...
Anxious	Stress due to change in teaching and learning	Concern (employees' health and well-being)	Zoom/ Cisco WebEx/ Google Meet/ Skype / Teams	WhatsApp	Vaccine tests	Engaging students to support local SMEs during their semester (dissertation, final assignments)	Social, digital innovations and entrepreneurship projects related to COVID-19	Mental health supports for the university community
Frustration	Tired (workload significantly increased)	Anxious	Webinars / TV channels	E-mail	Medical material for hospitals	Engaging academics to be innovative and entrepreneurial in their research projects	University as a key advisor in local/regional COVID-19 decisions and protocols	
Lonely (especially abroad students)	Worried due to poorer learning or quality of education	Optimistic	YouTube Videos	Phone conversations	Health faculty engagement	Engaging teachers to be creative in education and learning	University as a provider of solutions (vaccine tests, gels, material/instruments for hospitals)	
Depressed	Satisfied due university response	Confident	YouTube/ Facebook Streaming	Other apps			University campus (faculty of medicine) as the epicenter of pandemic (beds, patients)	
Grateful	Trust in the university response		WhatsApp	Conducting remote research				
Digital fatigue	Happy due life-work balance		E-mail	Interactive online experiments				
	Concern about the uncertainty of back to normality		Phone conversations	Big data				
	Fear of COVID-19 infection		Memes	Sentiment analysis				
	Empathy with infected colleagues/students			Geopositioning/heat maps				
	Sad/depressed due to life-work unbalance or lack of social interactions							
	Annoyance or disgusted							
	Worried due government response and uncertainty							
	Satisfied due to the positive students' feedback							
	Alertness and careful to follow protocols to avoid infections							
	Resilient							
	Optimistic							
	Digital fatigue							

Appendix 4: Entrepreneurial Universities' Disruptions linked to core activities to respond to the stakeholders' COVID-19 needs

	March 2020	Sept 2020	Dec 2020
	Wave 1		Wave 2
Digital disruptions	<p>T: Rapid transition to digital university platforms (Canvas, Blackboard, Teams, WebEx) complemented by Zoom, WhatsApp, etc.</p> <p>R: Time for doing research via Zoom and adding new technologies related to data gathering</p> <p>E: digital disruptions oriented to COVID-19 testing, treatments, medical equipment, SMEs support via apps</p>	<p>T: New digital methods and tools for assignments, exams and engaging students.</p> <p>R: Webinars, streaming and the implementation of new social digital platforms to generate more interactions (gather, ...).</p> <p>E: Emergence of digital social innovations, SMEs/entrepreneurs SOS apps, new business models</p>	
Emotional disruptions	<p>T: From stress, anxiety and distraction of students towards their gratitude and satisfaction of EU response</p> <p>R: From happiness and well-being to frustration for social restrictions, limited physical activity, time restrictions and digital fatigue</p> <p>E: From concerns, anxious, and worried to optimist, resilience and confident</p>	<p>T: From uncertainty about go-back hybrid methods, fear of infections to empathy and supportive with colleagues</p> <p>R: From frustration and digital fatigue to optimism and gratitude to the EU response</p> <p>E: Resilience, worried about the uncertainty, concerns with the eco-system</p>	

Note: T=Teaching; R=Research; E: Engagement or Entrepreneurship or Knowledge Commercialization