Selected track: *How can education institutions use digital tools to foster understanding responsibility and sustainability-related challenges in (future) business professionals?*

Title: Need for silence, craving for communication: the dyad digital education and soft skills in an emerging economy context

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Business education has been endeavouring to keep up with an evolving real-world business environment. Despite signs of progress and advances, there's still a long way to go: the civilizational challenges from today figure themselves as a daunting task that future proves the career being developed within business schools today. Sustainable development complex challenges like climate change, biodiversity loss, and inequalities have been addressed through educational technologies for a long time. They come into hand to create academic semantics out of complexity. Soft skills and digitalization find common ground in the COVID-19 context since the systemic crisis changes the shape of interaction and e-learning. In this scenario, high education institutions act as living labs for educational innovations alongside crisis management. Here we aim to scope how the business schools are managing the crisis scenario. We describe how a Brazilian institution promoted the digitalization of its teaching activities and how students felt during this process through a case study. Results indicate that students did not face issues related to digital literacy or readiness. Most challenges are linked to resource constraint setups, such as internet access and a proper place to study. Students also related their need for peer interaction, counselling and tutoring activities. Resilience, social and emotional skill has shown to be the essential feature of distance education's learning challenges.

Keywords: digital technologies, social and emotional skills, distance learning, COVID-19.

1. Introduction

Technology omnipresence has changed all dimensions of our life: the way we work, study, leisure (Lau et al.,2018). Classroom evolved from a unidirectional, textbook supported, lecture-based, and group feedback-dependent learning context to a physical independent, everywhere-everytime learning environment (Heflin, Shewmaker & Nguyen, 2017) that is not restricted to study oriented platforms like Moodles, and resources designed adequately to educational outcomes like the Massive Open Online Courses (MOOCs), but also percolates work-oriented platforms like google's toolkit and Linkedin, and social media interaction platforms such as Facebook and Instagram (Thomas, Johnson & Fishman, 2018; Shafer et al., 2018).

Changes are not restricted to a specific educational level, and they can be observed from early childhood to tertiary education. Children as young as four years old are being exposed to digital learning experiences in kindergartens, and technology assessment is said to be an essential tool for supporting educators in child-oriented pedagogy (Danniels, Pyle & DeLuca,

2020; Donohue & Schomburg, 2017). At mathematics teaching in the secondary level, technology is observed to aid collaborative development of the mathematical knowledge inside the classroom (Bray & Tangney, 2017). At higher education and postgraduation learning, changes manifest accordingly to different contexts, students from Spanish (Gil-Fernández, León-Gómez & Calderón, 2021). and South African (Mpungose, 2020) universities increased their use of social media and tools such as WhatsApp for educational goals.

The changes were intensified by the crisis: before pandemics, some say that teachers used digital education tools at least once per week and that during pandemics, the usage varied at an individual level but increased overall (Kaarakainen & Saikkonen, 2021). From the organizational perspective of the schools, there was a tsunami of online education (Guernsey, Ishmael & Prescott, 2020). But technology use in education is not exactly a novelty. Some of the highly popular online platforms of today, such as WebCT, Moodle, Docebo, Adobe Captive, Google Classroom, Lectora, Udemy and Blackboard, have been presented for more than a decade. Some niches were still creating momentum or lagging behind in digital technology usage, and Covid-19 acted as an intensifier for it (Goldschmidt, 2020).

The employability context is being shaped by Industry 4.0 (Rajnai & Kocsis, (2017), the demands are being tractioned by market requisites for professionals with adequate literacy to operate the new digital paradigm (Flynn, Dance & Schaefer, 2017) inducted a growing in the offer of online education, specifically for degrees in technical disciplines (Ruthotto, Kreth & Melkers, 2021). As Information and Communication Technology (ICT) advances in education, the boundaries separating the physical and digital world gets blurred. A major call for soft skills in technology-oriented courses appears, which has been the subject of growing research interest in the past few years (Lau et al.,2018, Lavi, Tal & Dori, 2021, Goulart, Liboni & Cezarino, 2021). The student-educator interaction changed dramatically: the group discussions and case-study solving, the face-to-face feedback, and tutoring (McDuffie, Mastropieri & Scruggs, 2009) gave room to the "endless" calls at zoom.

Despite the almost exponential growth, distance education comprises challenges that need to be overcome so that the learning objectives are achieved in a way equal or superior to on-site teaching. The result is a result of the structural order, such as the need for virtualization of learning and teaching technologies and the challenges arising from this.

The experience that students might have in their course is influenced by factors such as demographics and professional background (Ruthotto, Kreth & Melkers, 2021) and, on the other hand, also have a transformational impact on countries employment demographics (Flynn, Dance & Schaefer, 2017).

The digital divide is more evident than ever in the Covid-19 era, which is also reflected in the increase in socio-economic inequalities linked to access to education. Bhandari (2019) indicates that access to technologies carries a strong component of gender inequality and that, although the samples are influenced by the context, in general, women are in a vulnerable situation.

Digital literacy and qualification in emerging economies are a second layer of the digital education gaps that reflects in the personal development and economic advance of the countries (Goulart et al., 2021). Although new technologies can bring a reduction in the cost of learning, their ability to reduce gaps and minimize global inequalities in education is still an uncertain field (Pollack Ichou, 2018). by Covid-19's health crisis, in particular, by promoting a "forced

digitization" (Karakose, 2021) and accelerating agents who were building momentum for digital technology migration is an open road for research to harness theoretical and practical implications.

2. Socioemotional skills for TI in the COVID-19 Era

The use of information technology alternatives for teaching and learning has grown exponentially in the context of the need for physical isolation caused by the COVID-19. Some schools were still on the sidelines of digitization or using the tools incrementally, and as support for teaching practice, Covid-19 had a transforming role and which allows us to look at the recent past in the light of the living concept. Labs for education (Siekkinen, Pekkola & Carvalho, 2020) and specifically for digital education (Sroufe, 2020). A careful reading of how a sanitary crisis, systemic and global, changed the educational context at a global level in a window of a few months is of paramount importance for the continuity in the development of the theoretical framework in digital education.

Nevertheless, many of the efforts were rushed: teachers and schools saw themselves in a context of mandatory digitization of their pedagogical approach. This movement has two main implications, one that is grounded on technology constraints, mostly related to vulnerable settings (i.e. emerging economies and impoverished communities) and second, the one referred to the losses of educational potential in solutions that are just transposed to the digital world.

Both dimensions are intertwined. Cost related to the acquisition of digital teaching solutions such as games and specific software (Scherer, Siddiq & Tondeur, 2019) and the dependence on practical activities (Kaarakainen & Saikkonen, 2021) influences how easy the pedagogical approach can be converted in distance learning. Regular e-learning tools can have a wide array of possibilities, from digital textbooks (Lau et al., 2018), to highly interactive activities such as Web-based learning (WBL) (Adi, Kurniawan & Siddik, 2021) and the uses of machine learning-based platforms (Balica, 2018). Therefore it is possible to work on a gradient between the complexity of tool resources and interaction demands, and the gradient is empowered by the perspective of the digital readiness of the millennial generation. In an environment without extreme resource constraints, students have either a good digital literacy level or are easily trained with the technical competencies to access an educational environment.

To achieve a long-lasting and meaningful education, the process must be grounded on discursive, interactive, and reflexivity activities, and this is both a call and also a shortcoming of digital e-learning solutions (Laurillard, 2002). Studies show that digital education can act in both ways, also being successful in fostering the development of general communication skills and mental readiness (Adi, Kurniawan & Siddik, 2021).

Soft skills or socioemotional skills have a crucial role in higher education for IT professionals, and the offering of a degree combining IT education with socio-emotional skills requires a higher level of communication between students and educators (Goulart, Liboni & Cezarino, 2021). A similar situation is found in engineering degrees. Valeyeva et al. (2019)

concluded that the development of IT skills, information literacy, teamwork skills, flexibility competencies and metacognitive skills are only fully possible with soft skills training.

3. Methodological approach

We split our work into two main steps, first comprising exploratory bibliometrics grounded on keyword mapping and keyword in context analysis. The tool used here is the VOSviewer software for building keywording semantics that provides visual aggregated analysis while grounded on validated algorithms (Ding & Yang, 2020). Cluster visualization is a way to obtain an overall picture of the published content interwovenness and also to flag research trends and gaps (Fergnani, 2019).

The usage of VOSviewer algorithms for higher education context is recurrent and spread in a wide array of specific thematics such as I) sustainability in grey literature at higher education (de Souza Marins, de Souza Ferreira & Ramos, 2021), II) entrepreneurial skills evaluation (Xiyang, 2020), III) physical education management (Zhangyin, 2017), IV) augmented reality in physics education (Putri et al., 2021) and V) interdisciplinarity at education for sustainable development (Martins, 2021). And as expected, the tools were also applied to covid-19 specific topics (Noor et al., 2020). The exploratory review was carried out using the keyword strings that combined the constructs related to "information technology" and "soft skills" and their variants. Results are shown in a keyword graph format, where nodes are the terms, and the edges are the weighted co-occurrence in the papers.

The second step comprised a questionnaire with 15 structured questions and one open-ended question; it was applied in a school that has a specific purpose within the Brazilian higher education market: they focus on Information Technology bound with business education internship program and carries its mission grounded on development of socio-emotional skills.

4. Results and discussion

4.1. Keyword clustering

An exploratory review carried with two strings of keywords, we aimed at scoping the constructs in the opposite networks to identify the role and representativity they had in relation to each other. In summary, we scope the place and relevance of "information technology" in the "soft skills" network and the other way around.

Table 1 - Keyword string parameters

String 1	
Keywords in title - boolean operator "OR"	"information technology", "IT", "Information and Communication Technology", "ICT".

Keywords in title, abstract or keywords - boolean operator "AND"	"Higher education"
Language	English
Document type	Article
Time frame	N/A
Field area	Open - All fields
Returned amount of papers	1,546 articles
String 2	
Keywords in title - boolean operator "OR"	"soft skills" OR "noncognitive skills" OR "character skills" OR "life skills" OR "21st century skills" OR "socio-emotional" OR "socioemotional"
Keywords in title, abstract or keywords - boolean operator "AND"	"Higher education"
Language	English
Document type	Article
Time frame	N/A
Field area	Open - All fields
Returned amount of papers	155 articles

The first conclusion that rises is the size of the research field when narrowed down by the higher education context. Information technology returns ten times more papers. Soft skills are being widely propagated as pedagogical guidance principles and practices. Nevertheless, it is somehow a novel topic that is yet to be defined as a construct and as a research field (Versuti et al., 2020). The papers fetched from String 1 were loaded in VOSviewer software, and the keyword graphs (Figure 1) were formed by the most recurrent 241 keywords (>5 counts).
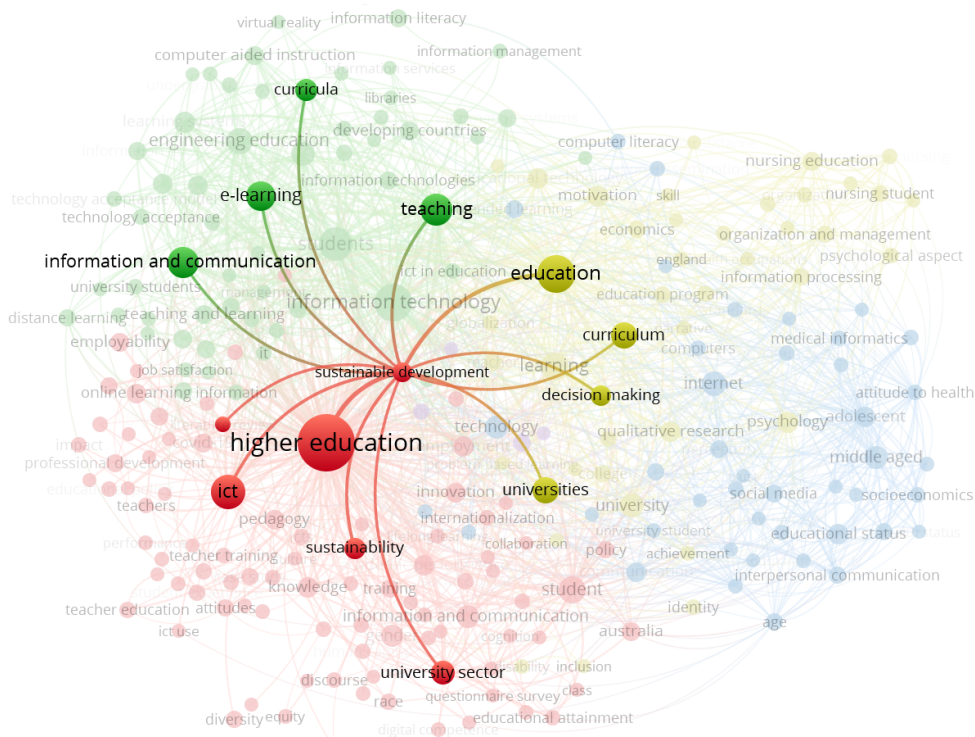
Figure 01. Clusters formed in the IT network

The figure shows 07 main clusters representing the IT framed under higher education construct. Clusters allow data visualization at an aggregated level (Van Eck & Waltman, 2017), and inferences using the communities formed by clusters to scope interdisciplinarity connections are being used in areas such as management and sustainable development education (Cezarino & Corrêa, 2015; Martins, 2021). Clusters are divided and interconnected in thematics that are hardly detached from each other; for instance, the keywords: "employability", "employment", and "career" appear in different clusters, same happens to "gender" and "gender equality". Also, the amount of clusters formed (07) considering a small network (241) indicates heterogeneity of thematics widely connected among them. It is not possible to make inferences regarding communities orbiting around specific thematics or field areas.

The meaningful result that can be extracted from this network is that there is mention of "soft skills", "socioemotional skills", or similar terms, in other words, when fetched the most relevant 1546 papers with IT and scoped in higher education institutions, and soft skills were not mentioned five times in papers title, abstract and keywords. Also, the concept of sustainable development is in a central position of the network connected to a wide array of clusters.
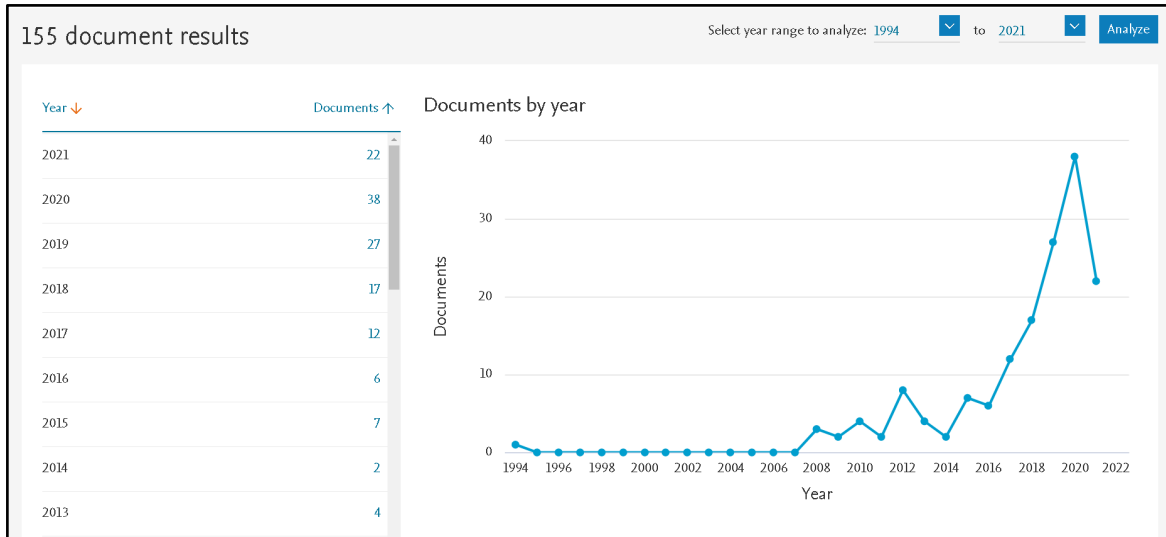
Figure 02. Evolution of publications in soft skills thematic

The String 2 returned a total count of 155 articles, despite indicating a huge leap in the publication amount after 2016 (Figure 02). And the network formed by the most recurrent 29 keywords (>5 counts) showed no mention of information technology or ICT constructs directly. Nevertheless, adjacent constructs such as "e-learning" and "computer-aided instruction" appeared in a modest and peripheral way (Figure 3).
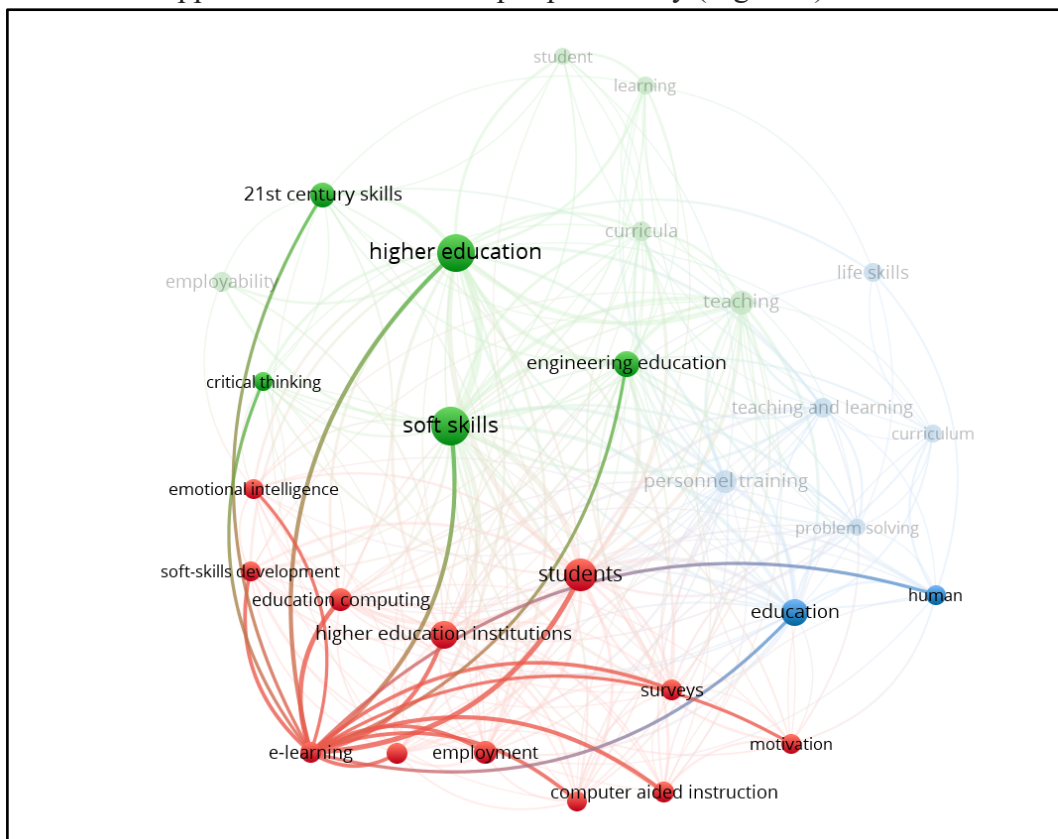

Figure 03. Peripheral position of e-learning in the Soft skills network

The suggested rationale underlying the presence of a construct that is closer to IT or ICT in the soft skills can be followed by the spreading of the topics among different knowledge areas: at the soft skill network, "Computer Science" appears as the second most recurrent field for the publications, followed by "Engineering". Therefore, relevance seems to have been given to these connections between the so-called "hard sciences" and the "soft skills", in accordance with studies from Goulart et al. (2021) for computer sciences, and Fernández-Sanz et al. (2017), Schipper & van der Stappen, (2018) and Valeyeva et al. (2019), for engineering teaching and education.
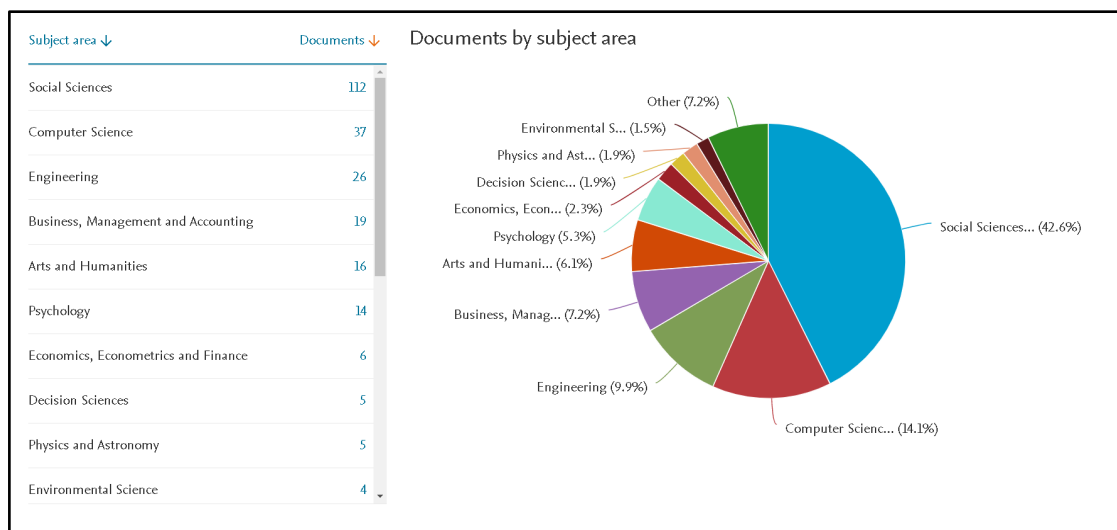

Figure 04. Representation of publications through the fields of knowledge

4.2. Questionnaire responses

We obtained 301 answers to our questionnaire. 56% of the respondents said to have had no major difficulties in accepting the social distance measures, while 41% reported challenging situations. Results are somehow unexpected, considering the pandemic's context. Around 85% of the students from 180 countries have fully migrated to digital classes (World Bank, 2020), and COVID-19 are being addressed by recent research as a predominantly stressful event (Lee, Jeong & Kim, 2021; Masha'al, Rababa & Shahrour, 2020). The hindering factor for students' motivation and learning outcomes is grounded on a systemic chain of wellbeing factors such as sleep and dietary disturbances (Du et al., 2021).

14% of the students said that they don't face any kind of difficulties with online learning, the remaining 86% of the students categorized their difficulties in three dimensions: Technical and operational difficulties (23.3%), emotional difficulties (28.7%), and difficulties related to learning (34.3%). Some of the respondents choose to clarify their points in a qualitative way, which are reported in Tables 2 and 3.

The majority of the students (186) were also working part-time during the time of the COVID-19. Almost 100% of them didn't have their salaries reduced or changed in any matter, which indicates another specificity of the sample. In the Indian context, the crisis conundrum greatly impacted the employability of undergraduates (Das, 2021). Despite the regular stability

of the student's remuneration, their families faced impoverishing situations: 64% of the respondents reported a reduction in their familiar income, and 28% reported a high degree of financial limitations in their families. Families impoverishment has been identified as one of the factors that were re-energized during pandemics and that is responsible for sustaining or widening the educational disparities, especially in emerging economies (Mengistie, 2021)

Table 2 - Students observations regarding technical, operational and infrastructure challenges

Noisy environment and a few limitations of my PC.
I can't use the platform well and I find the process complicated.
My family's frequent gaze makes me uncomfortable and even limits some of my actions.
I don't have a suitable environment to study, staying in common and noisy areas of the house
My chair is very bad and my family fights a lot
The only problem I had during 2 classes was the internet, but apart from these exceptions it was pretty quiet
I end up working more than I should, making leisure time impossible
internet at home is very unstable
I'm not having difficulty, but my internet sometimes goes down.
Sometimes the internet goes down or is very slow
Lots of distractions indoors
The internet fails sometimes
noisy environment
I don't have space dedicated to it and the family is always around
I have restrictions or limitations for computer use and my internet is bad or non-existent.

Only one of the respondents mentioned that the university's educational dashboard was a barrier. The sample's digital readiness seems to be not affected by Covid-19, in accordance with results from Händel et al. (2020) on its evaluation for technology availability, literacy and skills for digital learning. This finding suggests that to enhance the effectiveness of e-learning, easy-to-use collaborative platforms and tools need to be provided to enable users

to work together to evaluate and create from what they have learned in the previous stages (Lau et al., 2018).

Educational and professional platforms are each day more alike to the daily leisure spaces; they resemble the well-succeed gamified experiences from the social media platforms, allow interaction and development of bonds among colleagues and allow replication of the content in multiple platforms with different goals. The level of literacy needed to navigate through an MBA dashboard is nowhere different from managing a Facebook friends group. The common syllabus reduces the learning curve while dramatically increasing tool familiarity, in addition to a wide array of educational platform options, many of them free of charge, making the tool interaction the least of the issues. There is a strong perception that educational platforms should consider blending with personal e-learning tools, such as WhatsApp (Mpungose, 2020), and COVID-19 empowered, even more, this movement towards blending between educational/leisure e-tools (Gil-Fernández, León-Gómez & Calderón, 2021).

Abuselidze, Radzivilova & Mohylevska (2021) points out that stressful aspects related to digital learning refer to the lack of universal access to the internet and other demands on physical infrastructure. Our sample biggest challenges portrait refers to issues with internet availability and instability and a proper workspace with silence and fewer stressing factors. This connects our sample with studies from other emerging economies, such as Romania (Roman, & Plopeanu, 2021), where the same dyad internet access + space for the study was highlighted. Many respondents from our sample pointed out issues related to "unwanted family interactions" during the digital classes, and that hinders their learning potential. This saying sheds light on how systemic are the effects of the pandemics and how it interconnects education with other dimensions of life; not only students are affected, but also the educators and families of both (Karakose, 2021).

Regarding the student's engagement and motivation, 79% of them reported that their study intensity (hours dedicated to study) remained unaltered or even increased during the pandemics, while 19% said to have been experiencing shortcomings in their study outcomes. Approximately 30% of the students reported some degree of difficulties with online education, while 58% of them said that they have no issues with online classes, and it does not change their motivation or engagement, either in a positive way with more engagement (26%) or in a negative way, by hindering the motivation (32%).

Table 2 - Students observations regarding emotional and/or learning challenges

EMOTIONAL DIFFICULTIES
Ah laziness increased considerably and procrastination consequently
I feel like I don't enjoy 100% of the class because it's online.
The longer you spend in isolation, the harder it becomes to maintain 100% in every way
I don't feel good about the isolation, it lets me down, however, knowing that I try to dedicate myself in addition to "planned" to eliminate the feeling of "wasting" time or content

In my view, the difficulties are related to my mental fatigue. Also along with some points specifics of the previous options, I normally learn but I believe that in-person I learn more, isolation is starting to disturb me emotionally

The biggest difficulty is the lack of interaction with other students, as this brings a new learning

The biggest difficulty I have is accessing people. It's slower to ask questions and ask for help. At the face-to-face model, for example, it's much easier to contact colleagues and talk to people and ask some kind of help, even with people from other classes during break time, was simpler to solve problems by being there together even on the same machine. And in the classroom, it was something more dynamic and interactive, almost like a conversation with the teachers. The remote model doesn't have these things.

DIFFICULTIES RELATED TO LEARNING

Sometimes I can't absorb the entire content of the class, but then I review my notes and review the class.

I have no difficulties with online teaching. Of course I would prefer the situation to be better, with classes in person, without daily deaths by the thousands and without the fear of leaving the house... But no difficulties as for online teaching! I notice the teachers' effort to teach and I try to show them my effort to learn!!

I have difficulty answering questions

I miss the shifts after classes, as doubts were already taken away more quickly

I have a degree of attention deficit, which hinders me a little in more theoretical classes

Difficulties in solving doubts

The biggest difficulty I have is the distraction sometimes

Pay attention for a long period of time

I don't have much discipline

I have some doubts and sometimes by video it's bad to learn

I lose focus more easily

Difficulties in staying focused.

study routine

My biggest difficulty is procrastination, which has gradually become even less frequent

The learning tool format plays an important role when it comes to issues related to interaction in digital learning. While static learning resources (i.e. recorded lectures and textbooks) that are grounded on view and reading activities require low, or zero, maintenance from a teaching point of view (Lau et al., 2018), the more complex and collaborative the tools are, the more communication they will require. Also, the field of knowledge and teaching thematics have their own impact: the fewer practical assignments needed, the easier for the content to be digitalized without much effort (Kaarakainen & Saikkonen, 2021).

The socio-emotional skills approach requires, by default, a more interactive milieu. Social contact changes caused by the crisis are traumatic and with long-lasting effects, remaining one of the shortcomings of digital education (Naidoo & Cartwright, 2020). Since our sample belongs to an Information Technology college, it is expected that a great amount of learning by doing activities to be present, and this aligns with the major concerns of the students, that does not seem to have any kind of difficulties with technology, and demands a "silent study environment" while craving for communication and peer-interaction.

5. Conclusion

COVID-19 pandemics are already the major educational game-changer of the decade. Its impacts are perceptible, although there is a long way to go for them to be measured and detailed in such a way as to serve as further guidance for decision-making. Study conclusions are aligned with similar and contextual based perceptions with case studies recently carried around the world. The educational trauma of pandemics is not it is not circumscribed in the teaching and learning dimension and is far from having its nexus located at the digital readiness of our generation.

Our sample is composed of students from a technology-based higher education school, with a motto for socio-emotional skill development, located in an emerging economy country. This configuration is specifically relevant to address tertiary education in a context that demands both digital readiness and emotional resilience. The major issues related by our sample of students refer to learning difficulties that are either connected to the lack of structure (namely internet access) and emotional instabilities caused by the isolation. In alignment with studies such as Mbunge et al. (2020), we highlight the call for the same degree of attention to the provision of psychosocial assistance alongside improved internet bandwidth services. Hybrid solutions applied to counselling services and peer tutoring are valid alternatives for extenuating the social distancing conundrum caused by covid-19 (Naidoo & Cartwright, 2020).

There is also an alarming call for a kind of "educational tipping point", caused by the extensive challenges faced by undergraduates in emerging economies such as Brazil, India and South Africa, that can result in a lost generation (Mbunge et al., 2020) and widen even more the global educational gaps.

5.1. Theoretical, Practical implications and Study limitations

The results achieved here contribute theoretically to the development of the area represented by the overlap between digital education and soft skills. Practical implications lie in the specificity of the case study here: the discussion refers to a critical issue for national development, in a geographically specific context, of an emerging country, temporally unique, considered the Covid-19 crisis, and the characteristic of the sample. Questions with transformational potential are raised, which propose a remodelling of an educational system strongly supported by the hard sciences, which, in the midst of a systemic crisis that demands isolation, turns its eyes to human interaction and formation. The background of uncertainty about the technical skills demanded by the future gains clearer contours amid the challenge posed to educational agents related to the difficulty in dealing with their emotions and social challenges, despite the digital readiness.

Limitations of the study reflect the specificity of the case. The generalization of our findings is limited. The context is very specific, and further studies might enforce our conclusions. Our sample is also small, and this does not allow quantitative validation of findings. Further studies might expand the connections between soft skills and ICT education in a feasible framework, with empowered generalization capabilities, for emerging economies.

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