

DIGITAL INFORMATION AND COMMUNICATION TECHNOLOGY (DICT) AND ITS POSSIBILITIES IN EDUCATION DURING THE COVID-19 PANDEMIC

A TECNOLOGIA DIGITAL DE COMUNICAÇÃO E INFORMAÇÃO (TDIC) E SUAS POSSIBILIDADES NA EDUCAÇÃO DURANTE A PANDEMIA DE COVID-19

LA TECNOLOGÍA DIGITAL DE LA INFORMACIÓN Y LA COMUNICACIÓN (TDIC) Y SUS POSIBILIDADES EN LA EDUCACIÓN DURANTE LA PANDEMIA DEL COVID-19

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ABSTRACT: The measures adopted due to the Covid-19 pandemic intensified a process that had already begun: the use of digital information and communication technologies (DICTs) to teach in the 21st century. In this paper we list and indicate technologies that can be used free of charge in everyday life for teaching practices in virtual environments. We use as theoretical basis authors who approach education in network, social network for education and collective intelligence to reflect the challenges found by teachers during the social distance. We conducted a literature review and elucidated, from the analysis of technologies, the importance of DICTs, from the correct choice to the promotion and construction of an environment of knowledge exchange in the virtual environment. Thus, through mediation and dialogue, teacher and student have the possibility of, together, overcoming the difficulties imposed on education by social isolation.

KEYWORDS: COVID-19. Social isolation. Education. DICT.

RESUMO: *As medidas adotadas devido à pandemia de Covid-19 intensificaram um processo que já havia se iniciado: a utilização das tecnologias digitais de informação e comunicação (TDIC) para ensinar no século XXI. No presente trabalho elencamos e indicamos tecnologias de utilização gratuitas no cotidiano para práticas de ensino em ambientes virtuais. Utilizamos como base teórica autores que abordam a educação em rede, rede social para educação e a inteligência coletiva para refletir os desafios encontrados pelos professores durante o distanciamento social. Realizamos uma revisão bibliográfica e elucidamos, a partir da análise das tecnologias, a importância das TDIC, desde a escolha correta até a promoção e construção*

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de um ambiente de trocas do conhecimento no ambiente virtual. Assim, professor e estudante, a partir da mediação, do diálogo, têm a possibilidade de juntos poder superar as dificuldades impostas pelo isolamento social à educação.

PALAVRAS-CHAVE: COVID-19. Isolamento social. Educação. TDIC.

RESUMEN: *Las medidas adoptadas debido a la pandemia de Covid-19 intensificaron un proceso que ya se había iniciado: el uso de las tecnologías digitales de la información y la comunicación (TDIC) para enseñar en el siglo XXI. En el presente trabajo enumeramos e indicamos tecnologías de libre uso en la vida cotidiana para las prácticas docentes en entornos virtuales. Utilizamos como base teórica a los autores que abordan la educación en red, la red social para la educación y la inteligencia colectiva para reflejar los retos encontrados por los profesores durante la distancia social. Realizamos una revisión bibliográfica y dilucidamos, a partir del análisis de las tecnologías, la importancia de las TDIC, desde su correcta elección hasta la promoción y construcción de un entorno de intercambio de conocimientos en el medio virtual. Así, profesor y alumno desde la mediación, desde el diálogo tienen la posibilidad, juntos, de superar las dificultades impuestas, por el aislamiento social, a la educación.*

PALABRAS CLAVE: COVID-19. Aislamiento social. Educación. TDIC.

Introduction

In December 2019, the China Health Authority alerted the World Health Organization (WHO) about numerous cases of pneumonia of unknown etiology in Wuhan City, China (CHEN, 2020). On January 30, several cases of SARS-CoV-2 virus infection were confirmed in China and 18 other countries. On the same day, the WHO declared the SARS-CoV-2 outbreak as a Public Health Emergency of International Concern (BURKI, 2020). As of September 30, 2020, in Brazil there were 4,810,935 confirmed cases and approximately 144,000 confirmed deaths (BRAZIL, 2020).

With the advent of the pandemic, non-face-to-face relationships have intensified, encouraged by various global health bodies, such as the World Health Organization (WHO, 2020). Activities have shifted from face-to-face to online (remote learning). The internet became a strong ally to social distance and some autonomous professionals intensified the dissemination of their products on platforms such as Instagram, Facebook and YouTube (COUTO; COUTO; CRUZ, 2020). In education it was no different, initiatives emerged to display the congresses, forums, symposia, improvement courses for teachers and the emergence of online school activities, emerging the total migration of face-to-face activities to the environment mediated by information technology, in an emergency scenario, never imagined (MACIEL; LIMA, 2020).

Data from the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2020) and the United Nations Children's Fund (UNICEF, 2020) respectively point out that 91% of the world's total number of students and more than 95% of Latin America's are out of school due to the COVID-19 pandemic. Class has become each person's home, mediated by digital information and communication technologies (DICTs). In the pandemic context, teachers have been forced to use different tools and virtual environments or even social networks to stay connected with students. This whole process happened in an emergency way, without training to build a pedagogical architecture and without knowledge of the reality of the families that were and are on the other side of the screen (RIDLEY, 2020).

Reinventing has become the watchword. Teachers are learning to use different resources to teach their classes, as well as students and the school community. In this era of hyper-information, where we observe an increase in the flow of information and sharing, demanding new forms of exchanges and sharing (FERREIRA; PENA, 2020), the DICTs resurface as a set of media that enable new forms of communication, sharing, access to information and pedagogical practices, with the use of digital technology as a strategy to bring teachers, students and content closer together (ALVES; CABRAL; COSTA, 2020; MATTAR; 2014).

The pandemic of COVID-19 broke the paradigm of teaching and brought out numerous questions: what can we use in an emergency context with different limitations? Is it possible to teach in remote mode? And now at home, without being able to go out and with limited digital resources, how will the teacher teach? How can we adjust to the demands of each school and student? What about the Internet, which is still not for everyone? What tools can we use? Thus, this paper aims to present the DICT and their ways to promote collective intelligence, knowledge exchange, and learning in this new educational scenario.

The Digital Agora of Network Education

The historical context of Network Education begins in the 1970s, with the appearance of the personal computer, signaling the democratization of computing (GOMEZ, 2004). In the 1980s, the creation of collaborative processes begins, involving users, creation of vlogs, forums, chats, Wikipedia and virtual spaces. In the 21st Century, the era of connection, the period of ubiquitous communication was developed, such as 3G, Wi-fi and Bluetooth (NUNES *et al.*, 2016). Technology has integrated spaces and times enabling a new configuration of expanding education beyond formal spaces (GOMEZ, 2004; NUNES *et al.*, 2016).

Despite the emergence in the 1970s, the concept of Network Education was created in 2004 by educator Margarita Victória Gomez, receiving notorious visibility with cyberculture (NUNES *et al.*, 2016). Networked Education has diverse application and definitions, as well as its relationship with DICTs (GOEDERT; ARNDT, 2020), which provide teachers and students with collaboration and communication tools, reducing the physical distance existing during the period of social isolation (GOEDERT; ARNDT, 2020).

DICT enables advanced levels of knowledge search, interaction and achievement (MORAN, 2015). The teacher, irreplaceable, is the mediator in this learning process for a collective construction (FREIRE, 2002; NUNES *et al.*, 2016). But he also has the challenge of adjusting to technologies and going beyond the banking education paradigm, which sees the student as a deposit of knowledge (FREIRE, 2002). Each school reality has its singularity, as well as each learner, and it has used the DICT according to each community, with different methodologies that fit specific contexts, either in the use of virtual environments or social networks. However, the need for student debate and protagonism is widely defended, with the virtualization of the classroom. It is important to mention that the adoption of virtual environments or resources enables the development of skills and collective and collaborative learning among students, being an important point the choice of the appropriate tool or that they are more used to (LIMA; ROSENDO, 2014; VALENTE, 2014).

The virtualization of the classroom consists in using DICT in educational actions with information directed from the teacher to the student, who carries the stigma of content (FREIRE, 2002). But the difference is in the interaction with the student from these technologies, the learning to learn, the development of stimulus of the teacher in pedagogical actions for the construction of knowledge integrated with the student, the "virtual being together", the collaboration and development of new skills and competencies (LIMA; ROSENDO, 2014; RIDLEY, 2020; VALENTE, 2014). Skills and competencies that arise, today, in a pandemic scenario and socioemotional to deal with social isolation. Planetary to deal with health issues, so necessary today to prevent the contagion of the disease.

The promotion of knowledge currently takes place in cyberspace, using DICTs, and therefore the exchanges of knowledge, dialogical processes led by the teacher, can emerge in a collective intelligence (LEVY, 2007). What is our agora in the digital age? The Greek term agora means meetings, the place for public interactions, debates, and demonstrations. Agoras were built in Ancient Greece, having been the first in the City of Crete, and had the purpose that social networks have today, that of gathering people with common interests (ALVES; SILVA, 2019). These reflections lead us to think about when philosophers taught their classes

in public squares, as in ancient Greece, or when learning was transmitted from generation to generation. Currently, knowledge in our society is networked, in which informational, technological, industrial, and economic processes are moved in a digital sphere, our current agora (CASTELLS, 2018; MOREIRA; JUNUÁRIO, 2014; SIEMENS, 2005).

Everything is in constant and intense modification. The form of communication has also changed. We no longer write letters, we type posts. We share images instead of developing photographs. We send audios and videos, interact, exchange messages and click reactions on emoticons in apps, creating new relationships with knowledge (CASTELLS, 2018; DORNELES; CHAVES, 2012; LEVY, 2007). The internet has become a galaxy of information with its hyperlinks and inexhaustible libraries of subjects and knowledge in all languages. Tapering down, we have the platforms, social networks, various virtual learning environments, apps, games, and online access to museums. Combining creativity and DICT, there is a whole universe of possibilities and challenges to explore.

Possibilities and challenges: use of DICT in the pandemic

The COVID-19 pandemic intensified a process that had already begun: the use of ICT to teach in the 21st century. Some students were already using the technologies in their daily lives, enabling rapid communication. Allowing the use of the most familiar language or even the use of the cell phone camera to photograph the records made by teachers on the boards, during the lecture classes inside the classrooms (GARCIA; FERREIRA, 2011; MATTAR, 2014; MORAN, 2015).

Sanitary measures have been adopted by the Federal Government of Brazil, such as the provisional measure n. 934 of 2020, which defines rules of exceptional character for the school year of basic and higher education. The school calendar has also been reorganized by the National Education Council under Opinion n. 5/2020 (BRAZIL, 2020), which admits non-presential classes to fulfill the annual workload. According to the Fiocruz Technical Note No. 1/2020, to maintain the connection with the students, the teacher at home had to reinvent himself to plan the classes. This connection is focused on surveying the needs of each family of the students belonging to the school, in order to reaffirm the social role of the school. In addition to maintaining the connection with the community for the non-evasion and collective confrontation of the necessary changes, with pedagogical actions more appropriate to each segment, respecting the uniqueness of each family in each community (FIOCRUZ, 2020).

With so many possibilities on the internet, the uses of DICT in emergent teaching have brought many possibilities, but the teacher needs to be aware of the educational and social demands of students and in choosing the ideal tool to meet the educational purpose (LIMA; ROSENDO, 2014). Social networks, such as YouTube and Facebook, require studies for their use in the school environment, even though they are of everyday use for students and teachers (GARCIA; FERREIRA, 2011). The choice of technology or platform appropriate to the audience and context contributes to the development of skills and the learning process, facilitating engagement, collaboration, with the teacher as a mediator of knowledge (CANI *et al.*, 2020; LIMA; ROSENDO, 2014). This planning goes from the preparation of the location of your home, which today is the classroom, to the didactic organization, in addition to the challenge of changing the traditional pedagogical process and promoting engagement, given the difficulty of many teachers with the domain of technology or insertion in the classroom (OLIVEIRA; ANDRADE; ALMEIDA, 2010).

Goedert and Arndt (2020) described the lack of technological knowledge of some teachers, presenting little familiarity with the platforms, lack of training to be in a virtual learning environment, and described the importance of recognizing the resources, possibilities and their limitations. Thus, in the following, we will list and describe free, intuitive and accessible resources existing inside the DICT, aiming to help teachers with their students, respecting their realities, territorialities and specificities, thus being a point to enable the construction of an environment of exchanges and construction of knowledge in the virtual environment.

To start the construction of a class indoors, transporting the classroom to the virtual environment, some basic equipment is needed: (1) to transmit the content, a computer or cell phone; (2) to make the transmission through the signal, Wi-Fi or data packages such as those available from 3G and 4G telephone operators; (3) lighting for videoconferencing, which can be the bedroom lamp or even a light ring and; (4) office package installed in your equipment. Students and teachers from several Brazilian public institutions can sign up to receive "Office 365 Education" for free, through the link: <https://products.office.com/pt-br/student/office-in-education>. This package includes Word, Excel, PowerPoint, OneNote and Microsoft Teams, which are important tools for the virtual classroom. In addition, there is another suite of free applications, LibreOffice⁴, similar to Microsoft's Office suite. It is important to have the pedagogical plan of the class to think and decide which possible resources for the application

⁴ Available at: <https://www.libreoffice.org>. Access on: 10 July 2022.

of these applications in a didactic way in cyberspace. When we mention the term "free" it is the possibility to explore the technology presented from a registration by e-mail or telephone, without the purchase of any additional premium plan.

For recording lessons or conducting online classes, the teacher can use Zoom and send it to the students. Other interesting possibilities are Loom, Skype and Microsoft Teams. All are considered free platforms, in which the teacher can make videos and save them for future dissemination. With these few resources it is already possible to start safely, quickly and free of charge the creation of a class in the virtual environment, whether synchronous, which requires the participation of the student and teacher at the same time and in the same space; or asynchronous, when there is no need for student and teacher to be concurrently connected to perform the tasks and that learning is adequate (FIOCRUZ, 2020). In asynchronous activities, which also promote reflection and engagement according to the availability and routine of the student, the time can be defined according to the theme, being suggested the duration of 1 to 4 weeks (MOREIRA; BARROS, 2020).

One application that has become the teacher's main ally in times of pandemic is WhatsApp⁵, platform that enables sending and receiving instant messages with more than 800 million users. The application can be used as support for education by sending texts, videos, sounds, images, audios, podcasts, links, hyperlinks and links (MATTAR, 2014; MORAN, 2015). Besides the individual interaction of the teacher with the student, through private conversations, on WhatsApp the teacher can create specific groups for each class (up to 256 people) and provide video calls to answer questions in group (up to 8 people). In addition, another great benefit of this technology in Brazil is that most mobile operators allow unlimited access to WhatsApp, i.e., data transfers by sending and receiving messages do not generate consumption of the user's data package, thus increasing the possibilities and dissemination of content between teacher and student during the period of social isolation.

An example of the pedagogical use of WhatsApp is the case of a school in Riyadh, Saudi Arabia. Teachers created groups for learning outside of class with sending questions and bonuses to students who got them right (RAMBE; BERE, 2013). Another study, conducted in South Africa, found high student participation and collaboration in WhatsApp discussions because of familiarity with the tool (ARAB NEWS, 2015). In Spain, a work focused on improving reading in English language learning was developed, obtaining participation and adherence of 90% of students (PLANA *et al.*, 2013). Thus, we observe that the use of these

⁵ Available at: <https://www.whatsapp.com/>. Access on: 10 July 2022.

everyday resources can enhance student interaction and participation, and it is possible to use our experience with WhatsApp or everyday resources for teaching in a virtual environment in the emergency context caused by the COVID-19 pandemic.

One of the largest social networks is also considered an DICT and can be incorporated into teaching in a virtual environment, Facebook. With about 2.603 billion users, this technology allows the use of resources for learning: the creation of groups, pages, and private or public discussion forums. The teacher can open these virtual spaces, describe netiquette, which are group rules with the dynamics of the classes, and insert educational material, elaborate bibliography with references and hyperlinks. The difficulty of creating groups in the virtual learning environment is that the teacher needs to understand and master the group dynamics, so that the interaction among them happens spontaneously, whether in comments, reactions or reflective comments. After all, there are countless classes, schools and students. The communication can be synchronous, via comments on a live stream of the teacher by the group, or asynchronous, when the time of the posted material is different from the time of the comments, being important the construction of knowledge in the exchange of messages and sharing of posts (POSSOLLI; NASCIMENTO, 2015).

YouTube⁶, social media with more than two billion users, launched in 2005 and acquired by Google in 2006, can also be used in education. The creation of channels that enable the transmission of lives on this application has drawn the attention of many professionals. Using his own YouTube channel, the teacher can create periodic activities on the platform and, later, store them on his channel through playlists, which can be specific to the theme of each class. These playlists can be public, being displayed in searches: everyone has access to them and they are visible on the teacher's channel page; unlisted, they do not appear in searches, but are visualized only with the link, which can be shared by the teacher with his students, and; private, they also do not appear in searches, and only the teacher has access to them. But even so, we observed in the experience of Oliveira *et al.* (2021) with the use of Rede Minas on YouTube, the challenge with the internet, information, and the technical quality of videos for the teleclasses.

Another interesting feature of YouTube is that it allows the search for channels from renowned institutions, which have diverse and safe content. Thus, the teacher can perform a prior search and encourage students to participate in channels of relevant issues to their classes, serving as support material. With this, the teacher stimulates the students to build their personal

⁶ Available at: <https://www.youtube.com/>. Access on: 10 July 2022.

learning environments, subscribing to channels and saving their favorite videos (MATTAR, 2009). This process results in the increasing empowerment of students to share their materials for reflection, thus favoring the emergence of a collective intelligence (LEVY, 2010).

After identifying the main digital technologies as possibilities for education during the pandemic period, it is also necessary to think about the didactic organization. This process must take into consideration from the choice of the application, considering the specificities of each location, institution and school, as well as the peculiarities of the community and student, considering all the limits and challenges. Flexibility at this point is fundamental. The different platforms or applications enable us to do this. And they must be chosen according to the familiarity of both students and teachers. It is essential for the didactic organization to master the functionalities of the systems, platforms, and applications it chooses to use, and it is advisable to give preference to those we already use in our daily lives, thus promoting greater engagement and interaction of all (PLANA *et al.*, 2013).

Still emphasizing the didactic point of view, the teacher when teaching in a virtual environment faces challenges as in conventional classroom teaching. This new way of teaching with computer-based didactic resources requires preparation and planning of the activity to provide active learning moments that are meaningful for both the student and the teacher (CAMACHO *et al.*, 2020; GAMA *et al.*, 2020). In this sense, the teacher during the period of social isolation also needs to organize the didactics of teaching, through the presentation of content, indication and availability of the subject to be addressed in class, in a clear and objective way, and the methodology of topics followed by short sentences describing the subject may be adopted. From this process, arises the proposal of the curatorship training that will work, at least, two major topics: (i) copyright of the materials that are used by teachers, especially in virtual environments, in asynchronous moments (material recorded or made available without the authorization of the author or copyright holder) and (ii) incentive to register and share teachers' copyright products through free legal licensing, as "Creative Commons", for example, or in specific repositories, such as EDUCAPES and similar (FIOCRUZ, 2020).

DICTs have become essential artifacts, with lives, videoconferences, interactions in social networks, and in contrast comes the difficulty in accessing the internet for many students. Although many people still do not have an electronic device with internet access, data from the National Telecommunications Agency (ANATEL, 2018) point out that Brazil has a total of 236.2 million registered cell phones, a number higher than the Brazilian population, according to data from the Brazilian Institute of Geography and Statistics (IBGE, 2018), which corresponds to approximately 207.7 million inhabitants.

How to talk about DICT in a country where digital inclusion is still a major issue to be solved? With the advent of the COVID-19 pandemic, some initiatives emerged from institutions in offering tablets and internet modems so that students would not be left without school-related activities. Actions like this could be further encouraged in order to reach a larger number of students in Brazil. An alternative to help accessing the content produced by teachers has been adopted in some communities. The teacher, using the applications and features listed here, sends the material to the schools, which transform the digital information into printed material and enable the distribution of this content to the students. An interesting and viable alternative will be the use of open television programs, on various channels, that dedicate time for education, through partnerships with the education networks (FIOCRUZ, 2020). Thus, using DICTs, the teacher will increase access to knowledge, stimulating student learning during the period of social isolation.

Within the virtual environment, the frequency and the evaluation process will also need to be reviewed, which will imply a change in traditional teaching practices. All and any activity performed through the DICT and mediated by the teacher can and should be counted as attendance for the student, who knows if he is able to perform the action successfully, and the teacher can help in the path of this achievement, in the mediation of network interaction and collaboration. For Barbosa (2007), in an unequal society, this process is not a simplistic task, because it needs access to the internet to interact with the DICT, which are being used in a pedagogical way in this moment of necessary social isolation.

In relation to the public policies of digital inclusion by the school bias, we have programs aimed at internal school access, such as: the National Program of Information Technology in Education (PROINFO), ordinance no. 522/MEC of April 9, 1997, in force until 2006, originated by the Ministry of Education (MEC, in the Portuguese acronym), which is an educational policy that promotes the use of technologies in the public network, and the Innovation Program Connected Education, instituted in 2017. Regarding teacher training, with PROINFO, universities have implemented research and helped train teachers in computer science. But the challenge faced by Public Policies is the discontinuity of the programs due to lack of technical mastery by teachers, access by students, and inclusion initiatives: not all schools have digital inclusion activities, and many computers have not been installed in computer rooms or laboratories (ALVES; MAMEDE, 2020; BRAZIL, 1997; BRAZIL, 2017; CARVALHO; DAVID; VASCONCELOS, 2021; MARIANO; SILVA, 2020).

With the pandemic, the educational scenario has changed, and teaching starts to face the challenge of the remote, the adaptation of professional activities within the home environment,

the exhaustion of activities, lack of resources, lack of experience and adequate space to record classes, lack of familiarity with technologies, bad internet, consequence of the change experienced for teachers, students, parents and institutions (CARVALHO; DAVID; VASCONCELOS, 2021).

Regarding the institutions, strategies were created as virtual environments, such as Google Classroom, virtual rooms, Zoom, Google Meet, social networks, WhatsApp, Instagram, Facebook and resources such as emails, video classes, blogs and educational software (MARIANO; SILVA, 2020)

The inclusion policies have actions for the internal context of the school, but with the emergency scenario of COVID-19 and the need for remote teaching it was observed the importance of a legislation that meets the integration of technologies in the school and home environment (CARVALHO; DAVID; VASCONCELOS, 2021).

The DICT permeates through social networks, applications and free resources that can be used in education and teaching in virtual environments, a process described by Plana *et. al.* (2013) as a way to promote greater engagement in these relationships. The dynamics we propose comprises: (1) the choice of the DICT with which the teacher has greater intimacy and custom; (2) joining the ideal DICT according to the profile of each student and school; (3) planning and didactic organization; (4) creation of content and synchronous or asynchronous classes through the DICT; (5) as resulting in quality teaching and learning in this new environment, which is the virtual classroom.

Our challenge here was to select, after research among the available DICT in the virtual space, the ones we identified as working as possibilities for daily practices as teachers in their classes. Emerging knowledge on the internet, which is a big galaxy with its links, by sending students short videos or even complete lessons, keeping the didactics at a distance, has become an unprecedented need.

With these features, we believe that we will continue to provide a dialogical, emancipatory, protagonist education, considering the specificities of the teaching learning process, as provided in the National Curriculum Guideline (2013), and in accordance with the Common National Curriculum Base (BNCC in the Portuguese acronym), competence number 5, which points to the understanding, use and creation of digital technologies of information and communication in a critical, meaningful, reflective and ethical way inserted in social and school practices and that provide the protagonism in personal and collective life.

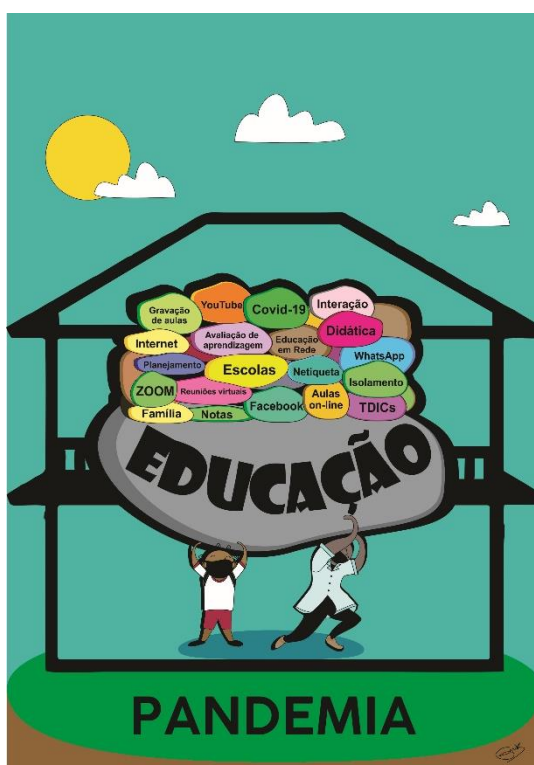
Final remarks

The quarantine and social isolation, consequences of the pandemic of COVID-19, have changed everyone's way of acting and thinking. Studies show an important behavioral change from the beginning of the pandemic, in which the population had their daily activities changed. This process is a reaction provoked, mainly, by the pandemic control measures, in which social isolation is necessary. This set of actions has started a process of reinvention of relationships, and consequently between student and teacher. The result that we are experiencing will be present in the Brazilian reality, because even with the development of a vaccine for COVID-19, the DICT will still be present and more fortified in the world educational scenario, being increasingly necessary the adequacy of teachers and students to the technologies used.

In this moment of reinvention and readjustment, the challenges for education during the pandemic are countless. Social isolation has also generated transformations in pedagogical and teaching processes. The DICT have been strengthened as true possibilities and enablers for the continuation of learning in the world.

Our final reflection is exposed through the illustration below (Figure 1), created together with the plastic artist Erick Maranhão, which has as its fundamental theoretical basis the philosophy of Camus (PIMENTA, 2018). We make the analogy to the concept of the absurd and human adaptation, in which the teacher and the student, in the residency scenario, hold together the weight of education and its challenges in times of pandemic, learn **together** to deal with the new virtual classroom, build **together** knowledge in a virtual environment, and finally, overcome **together** the difficulties of teaching imposed by social isolation during the pandemic of COVID-19.

Figure 1 – The Challenge imposed on teachers and students during the pandemic of COVID-19



Source: Illustration jointly created by the authors and provided by LITEB/IOC/Fiocruz art scientist Erik Maranhão

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