From Face-To-Face Education to Emergency Remote Teaching in Colombian Higher Education: Students' Perception of Factors Influencing Loss of Attention

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Abstract
The months of social isolation suffered worldwide have allowed us to identify a series of needs and teachings directly linked to the various methodologies associated with virtual education processes. In emergency situations, in various parts of the world, online education is used to give continuity to the educational processes in the Higher Education Institutions that are affected. The objective of the present study is to identify and analyze some factors of the student's personal environment, which affect the loss of attention, in emergency remote teaching received during the pandemic caused by the COVID-19 and its subsequent expansion in the current globalized world. For this purpose, 287 students from 7 different academic programs of the Universidad Distrital Francisco José de Caldas were surveyed, with the aim of obtaining information about factors that affect the loss of attention and the perception of this type of education. This exploratory study reveals other factors in the personal learning environment of students who use permanent or occasional online environments such as emergency remote teaching processes, which should be considered, and which should allow future studies on inattention in educational processes mediated by information and communication technologies, even for those who intend to investigate the effectiveness of online learning.

Keywords: *E-Learning; Emergency Remote Teaching; Student Attendance Capability; Higher Education; Pandemic COVID-19.*

1. INTRODUCTION
Digital technologies and virtual environments have gained recognition as one of the most widely used educational possibilities in the 21st century to cope with emergency situations worldwide. The ability to provide alternatives for communication and continuity of practice when experiencing limitations in the physical environment due to social crises caused by war has been recognized for some time [1]. In emergency situations caused by natural or social factors, institutions of higher education make use of these technologies for different purposes. The use of emergency social networks to restore communication after natural disasters, as is the case of the University of Louisiana in the crisis caused by Hurricane Katrina [2]; to serve students as evidenced after Hurricane Harvey [3] or following the New Zealand earthquakes in 2010 and 2011 [4] and 2016 as support for higher education teachers at the closure of face-to-face educational institutions [5]. This type of education has also been used in situations caused by social factors, and in South Africa, when student protests have closed the universities, this alternative is used to complete the face-to-face programs [6]. Even in post-conflict situations, in countries with great linguistic and cultural diversity such as Afghanistan [7]. In the time of the COVID-19 pandemic it could not be different, 149 ministries in countries around the world implemented distance learning strategies, which included policies for access to online platforms, access to devices and connectivity [8].

With the emergence of Covid-19 and the subsequent expansion in today's globalized world, educational processes as well as the activities of daily life have been substantially modified. With the recognition of the pandemic by the World Health Organization (WHO), measures have begun to be taken worldwide to improve emergency response mechanisms, formulate outreach strategies, implement measures for social control by isolating and confining the population, conduct tests, and monitor infections to protect the citizens of the world [9]. Over the course of the pandemic, the WHO continually generates recommendations and tools for governments in making decisions about public health and social measures, prevention measures in the workplace [10], at religious events, at school, and in the educational context [11]. The COVID-19 effect requires students to be kept away from schools and universities. As of May 25, 1,184,126,508 (67.6%) of the world's students were in detention, while as of October 25, 577,287,827 (33%) of the students in detention were still in detention, and educational institutions in 34 countries remained closed [12].

In the case of Colombia following the declaration of a health emergency (Ministry of Health and Social Protection [13] and the decree of a state of economic, social and ecological emergency [14], the government proposes the use of information and communication technologies in on-site programs [15], in two directions, the first directed at basic primary and secondary education focused on work at home by students, through the use of various educational technologies ranging from digital content from the "Learn Digital" portal, educational television from Señal Colombia, and educational radio through the "teacher at home" program [16]. The other strategy is aimed at higher education institutions, allowing them to use ICTs to provide temporary continuity to programs that have qualified attendance records during the time of the "health emergency" [17]. In this context, the Universidad

Distrital Francisco José de Caldas' online programs are being taught with the support of platforms such as Moodle or the Google suite (Classroom, drive, meet).

The education provided in this scenario is indiscriminately associated with online education, however, in university contexts at different latitudes the term "emergency remote teaching" ERT has been adopted, University of Hamburg [18], US higher education institutions, [19], the Middle East College Oman [20]. Some considerations about this type of teaching have to do with being a temporary educational response to an immediate problem available only during an emergency or crisis [21][22], which becomes an alternative mode of temporary distance education, which would otherwise be taught in person, and which will return to the classroom once the crisis or emergency is over [23][24], thus, remote emergency education is not an option but an obligation [25]. It does not aim to consolidate a solid system, but rather to make teaching and educational resources available quickly and reliably [24]. The speed, the obligatory nature and the radical migration of services and courses to online modes of delivery, expose the lack of planning and the poor equipment of the institutions to respond to the demands of the crisis, reasons why they are not can be considered online learning [26]. On the other hand, online education is a form of distance education planned in advance as a result of a rigorous design and planning of the instruction, completely accessible online, with the design of strategies characteristic of a virtual environment [23], focused on learning, prioritizing the changing needs of the student, allows access to and availability of tools in online courses [27], and prioritizes the effectiveness of student-content, student-student, and student-learner interactions and strategies for content learning [24]. Aspects such as: the modalities and pace of learning, the student-instructor ratio, the synchronization of communication, the role of the instructor and the student, pedagogy, and the role of evaluations characterize the design of online learning [28].

The problems identified at the time of implementing remote emergency education, in times of the COVID-19 pandemic, involve early detection by multilateral agencies of inequalities between countries, which the greater the wealth, the greater the capacity for response and preparedness, as well as countries with lower incomes, generate enormous inequality [29], inequality within higher education systems due to the heterogeneity of universities, which further widens the gap between historically favored and historically disadvantaged institutions, further deepening one of the structural problems in highly unequal societies, namely, access to quality education [30]. Inequality in access to higher education caused by the fact that many students do not possess the technological devices and appropriate connectivity to address this type of education [31][32]. Other problems focused on the teaching-learning process, associated with the characteristics of emergency remote teaching, where institutions that were not prepared for the sudden change are identified, denoting lack of planning, and poor equipment [26]; students with the false imaginary of the institutions about how equipped they were in terms of technologies and their management [19]. Teachers who did not have the appropriate equipment or Internet bandwidth at home or did not have sufficient expertise to deal with online tools [33], educators who showed no interest in this type of training for various reasons, either because they are soon to retire or because they are waiting for the moment to return to the classroom [26]. Problems identified in current synchronous communication technologies such as Zoon and Meet, and webinars [34].

Beyond the problems of inequality, those directly associated with emergency remote teaching, at the level of institutions, students, teachers, or synchronous communication technologies, in general the processes of teaching-learning mediated by ICT, whether online learning, have been identified a series of problems that have to do with the loss of attention capacity of students. There is a widespread perception that everything done online affects attention span "performing multiple tasks, checking email, chatting with friends, and surfing the web while attending online conferences. We are parents and teachers; we know this to be true" [35]. In less recent studies, conducted at a state university on business students, it was found that the more time spent on online social networks such as Twitter and Facebook, the lower the attention span, and that students' attention span is correlated with characteristics that influence behavior such as their perceptions of society, likes and dislikes, ease of use, and view of social networks [36], recently a study determined how excessive use of social networks, used for four functions socialization, social comparisons, enjoyment, and information seeking induces cognitive distraction and consequently influences students' academic performance [37]. Research from the field of psychology seeks to establish how online social networks have a negative impact on the subject and contribute to the development of addictions [38-39]. Regarding one of the most widespread uses of online education in general, the virtual conference format, there is a tacit consensus spread over 30 years ago under the name of the TED approach, supporters of this approach claim that a conference to keep its audience captive should not exceed 18 minutes, however, more than the length of the conference, there are other associated factors that influence and have more to do with the presentation of the content and the format of presentation of the conference itself [40]. Another study, taking as a reference point the use of interactivity in virtual conferences, commonly holds that the greater the use of interactivity, the better the quality, however, the misused interactivity can be classified as a disruption or a distraction mechanism [41].

The effectiveness of the teaching-learning processes mediated by ICT, and consequently of the students' results, depends on the implementation, the context and the characteristics of the student who interacts with the technology, not only on the technology [28], in this sense, the implications of context, those conditions that are on the other side of the screen, the student's side, the physical environment, those factors that are identified first-hand that impact the student's loss of attention in the time of the pandemic, pets, family members, students attending class from bed, are rarely addressed [27]. Still others, which are less addressed in educational research, but which have been reviewed recently in work settings, include factors such as brightness of sunlight patterns (fractal pattern, stripe pattern, and transparency), and potential effects on employees' visual comfort in the workplace [42]; or as indoor temperature

in indoor settings, affects assessment of the visual environment. as well as the effect of colored glazing and mood associations by people in office environments [43]; or as dynamic lighting distributions in automated buildings in relation to the hours of the day. And how they affect workers' alertness and performance [44], just to cite some studies on the effect of lighting on performance. Factors that can also affect the learning process, which can generate distraction, loss of concentration, and quickly generate fatigue in students, which have been taken into account in face-to-face education but very rarely in so-called virtual education, and have to do with factors such as noise, discomfort due to ergonomic postures, the culture of active breaks, and lighting. In this direction, the present study tries to identify and analyze from the students' perception some factors of the context of the student of the remote emergency education received in time of pandemic by the COVID-19, which affect the loss of attention and can end up affecting the students' performance, as well as the perception about this type of education.

2. MATERIALS AND METHODS

The population selected for this study is made up of 287 students from the Universidad Distrital Francisco José de Caldas in Bogotá, Colombia, belonging to seven (7) programs: Electronic Technology, Technology in Data Systematization, Technology in Medium and Low Voltage Electrical Systems, Technology in Industrial Production Management, Technology in Civil Construction, Control Engineering, and Telecommunications Engineering. Students from first to tenth semester, aged 16 to 25 years (only 3.5% exceed the age range of 25 years). whose origin by socio-economic stratum concentrates 62% (178) of students in stratum two (2), 21.3% in stratum three (3) and the remaining 16% in stratum one (1). Composition by gender, 84% (241) male students and 16% (46) female students.

The instrument selected for the collection of information is an online survey of 22 questions designed in google formats to be applied to the student population to collect information on various aspects. Personal and academic student information that allows the characterization of students (8 questions), physical learning space (2 questions) information associated with the devices used in the teaching-learning process (3 questions), ergonomic aspects (2), fatigue physical, visual and mental (4 questions), information on factors that affect the loss of attention (2 questions), and the perception of remote emergency education (1). See Table 1.

Table 1. Survey characterization of the questions

FACTORS	P	DESCRIPTION
Student characteristics	P1	First and last names
	P2	Age
	P3	Gender
	P4	Place of Residence (Neighborhood)
	P5	Stratum
	P6	Faculty
	P7	Academic Program
	P8	Semester
Physical learning space	P9	Area available for the educational process
	P10	Furniture for the educational process
Technological devices and tools	P11	Use of devices dedicated to the educational process
	P12	Technological tools used
	P13	Time of use of your device for educational purposes
Ergonomic aspects	P14	Most frequent posture
	P15	Sitting use of the back of the chair
Physical-visual-mental fatigue	P16	Frequency of breaks during the educational process
	P17	Time interval for pause
	P18	Time available for each break.
	P19	Reasons for pausing
Loss of attention	P20	Loss of attention due to environmental conditions.
	P21	Loss of attention due to performing activities at the same time
	P22	Perception of remote emergency education

3.   RESULTS AND DISCUSSION

As for the technologies used in emergency remote teaching (ERT) in the context of the pandemic, two aspects are investigated the first technological devices used, in this regard the use by students of computers whether desktop or laptop becomes the most used 63.6% make use of them, to a lesser extent the tablets 4.6%, however it is worth noting the use of smartphones in educational processes, which for this population of students is significant use as it represents 31.9%, indicating how this device has become mass. The second aspect has to do with the most used information and communication technologies and their degree of acceptance by students. In this sense, Google meet has 18% acceptance with (1268 points), google classroom 17% (1196 points), Internet for performing tasks 16% (1092 points), Google drive 15% (1072 points), YouTube 14% (977 points), Moodle 13% (911 points) and Zoom 7% (496 points), see Figure 1. Comparing the technologies according to the pedagogical use, it is possible to establish with more precision the comparisons from two categories.
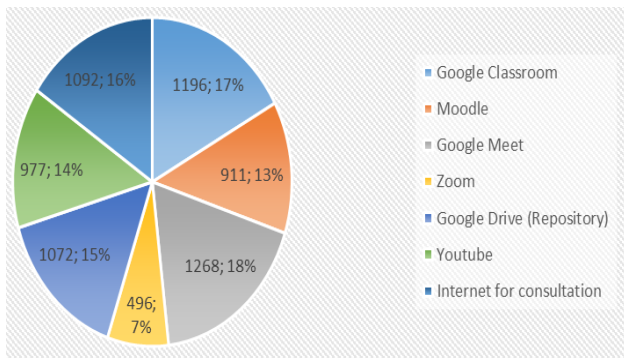

Fig. 1. Student-identified and higher-weight ICTs

Technologies for synchronous communication: These are technologies that allow the class to be taught in real time. Students identify two technologies: Google meet and Zoom; the first technology has an acceptance rate of 72%, while Zoom only has 28%.

Technologies for asynchronous communication: technologies that allow communication between student and teacher, taking into account much more the time of the student, usually the use of chat is essential, and also allows the scheduling of tasks, discussions, materials ranging from videos, readings, audios, recordings of the same classes. The university makes use of two technologies, the Moodle platform used for virtual careers and that some time ago has been increasing its use by teachers of face-to-face teaching, and even more in the new situation of pandemic, however, although it has a greater record of use, is less accepted by students with 43.2%, compared to google classroom with 56.7% acceptance.

In terms of the number of hours per day students spend on technology devices for educational activities, 1.7% (5 students) report less than four (4) hours, 16% (46 students) report 4-6 hours; 29.3% (84 students) report 6-8 hours; 25.8% (74 students) report 8-10 hours; 15% (43 students) report 10.12

hours; and 12.2% (35 students) report more than 12 hours, see Figure 2.
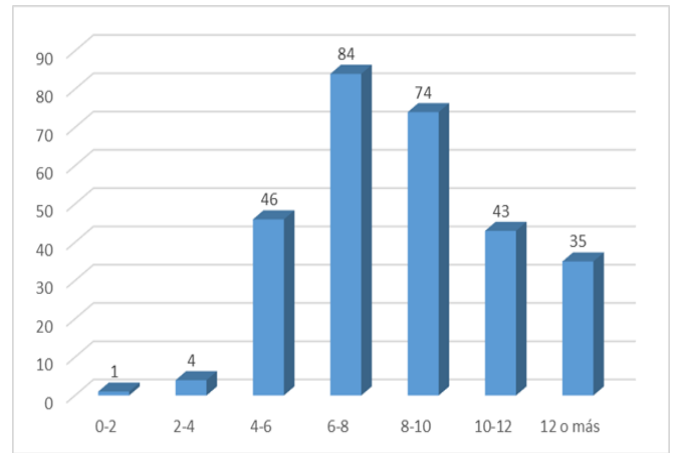

Fig. 2. Number of hours dedicated to educational activities

Some aspects that are addressed about the loss of attention in the present study investigate in the first instance by the incorrect ergonomic postures, at the moment of receiving the class, and it becomes more meaningful when it is identified, as 53% of the students stay for more than 8 hours a day, and that 31.9% of the students make use of their smartphones for educational activities. In this sense, 55.3% state that they take the class in a sitting position, however, the position of the legs determines a bad posture, legs bent (19.6%), legs completely stretched (18.6%), legs crossed (17%), leaning the head forward (18.9%), accounts for these postures that directly affect student fatigue. It is worth noting more critical situations in those students who receive the classes lying down (10%), bending (8%), standing (7.8%).

The high permanence of the students in front of their devices should contemplate a culture of active pauses, however, the study allows determining that the students do not have in their habits a permanent planning of rest, only 7.7% manifest almost always to make pauses, 82.6% of the students affirm that occasionally they make pauses, 8% never make pauses, see Figure 3. Regarding the time intervals 36% of the students declare to take a break every 2 hours, 31.4% every 4 hours, 18.5% every 6 hours, and 13.8% never. However, those who decide to take breaks state that the breaks are less than 15 minutes (66.6%), they take breaks between 15 and 30 minutes (23%), 7.7% make use of 30 minutes to an hour, and 2.8% of the students make use of an hour or more in their breaks.

With respect to the loss of attention on the part of the students, three general aspects were established that have to do with the conditions of the personal learning environment of the student, physical and mental fatigue; and the distraction that can generate certain activities that are susceptible to be carried out at the same time as the classes, such as the interaction with other technologies, see Figure 4. Likewise, they are given the possibility of quantifying each option in a scale of 1-5 where

one (1) has no incidence and five (5) the maximum incidence, the scores that are presented below are the total sum, for each item of the survey.
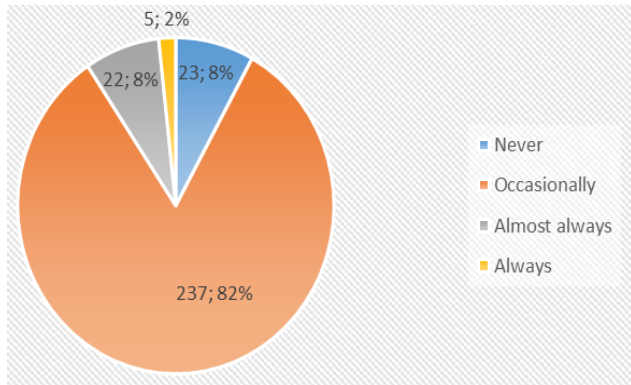
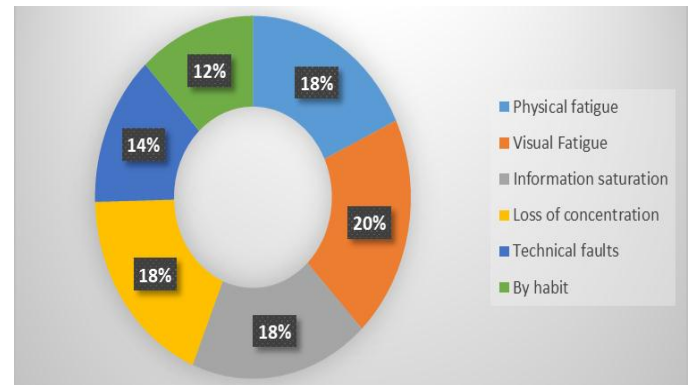although none of these technologies are among the ones that produce more inattention from the student perspective.

Fig. 3. Frequency of pauses by students

Fig. 4. Reasons why students take breaks

Among the technologies that were considered that could generate inattention when used at the same time of the development of the classes by the students are Instagram, Facebook, chat classroom, WhatsApp, activities of navigation in the network, listening to music and watching television, where the one that produces more inattention is the WhatsApp (881 points) and the ones of less incidence, the use of the chat classroom (540 points) and watching television (524 points),

Noise from the home environment, outside noise, conversations, lighting factors were considered as aspects of the student's personal learning environment. Both family noise (1001 points) and outside noise (1002 points), are the factors that generate more inattention, followed by personal conversations (925 points). Regarding lighting, low lighting with 834 points generates more inattention than high lighting. Finally, the factors with the highest incidence in inattention have to do with visual fatigue (1183 points), mental fatigue (1095 points) and physical fatigue (1077 points), see Table 2.

Table 2. Factors considered in loss of attention, weighting of students

P	Loss of attention factors	Points	%
P1	Low lighting	834	6,8
P2	Excessive lighting	711	5,8
P3	Noise from outside	1002	8,1
P4	Noise from the family environment	1001	8,1
P5	Personal Conversation	925	7,5
P6	WhatsApp	881	7,2
P7	Television	524	4,3
P8	Music	608	4,9
P9	Chat classroom	540	4,4
P10	Facebook	616	5,0
P11	Instagram	610	5,0
P12	Surfing the Internet	702	5,7
P13	Physical fatigue	1077	8,7
P14	Visual Fatigue	1183	9,6
P15	Mental Fatigue	1095	8,9
	Total Score	*12309*	*100,0*

4. CONCLUSIONS

The fact that 82.3% state that they spend more than 6 hours using their technological devices in educational activities, is a clear sign of the importance of taking into account welfare policies for the student, beyond the factors inherent in the teaching-learning process, there are other factors that have serious repercussions on the loss of student attention and affect academic performance, both for online modalities and for remote emergency teaching, and which are rarely considered.

As for the factors that generate levels of distraction in the students typified in the study, it is worth noting how students who come from face-to-face classes, and who are suddenly immersed in a modality mediated by ICT, state that factors such as mental, physical and visual fatigue, noise from the outside, noise from the family environment, personal conversations that take place in the same learning environment of the student significantly affects the attention on the teaching process, but it also indicates that it is a good idea to call this type of educational process "emergency remote teaching" ERT, since the evaluation of factors by the students, demonstrates as a problem, those conditions for which they were never prepared, the adequacy of a space dedicated to the educational process, environmental conditions of that environment, and the emphasis on the fatigue that this activity produces immersed in their daily space in a forced way, that badly that good if they are contemplated in the classroom education. For this reason, 70.4% (202 students) express a preference for face-to-face education, 25.4% (73 students), would be willing to a mixed education, only 2.8% (8 students) prefer an online modality.

Beyond the biosecurity conditions to mitigate the expansion of COVID-19, which naturally includes the confinement of students, it is necessary for this exceptional situation within higher education institutions, even more so those financed with public resources, to consider programs that address a pedagogy of care, that leads the student towards the evaluation of this type of factors that affect their attention and consequently their academic performance, strategies for the improvement of ergonomic postures, to develop the culture of active pauses, strategies in their home environment to mitigate noise, all of them conducive to form this pedagogy of care in students.

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REFERENCES

[1] Mark, G., & Semaan, B. (2008). Resilience in collaboration: Technology as a resource for new patterns of action. In *Proceedings of the 2008 ACM conference on computer supported cooperative work*, 137-146.

[2] DiCarlo, R. P., Hilton, C. W., Chauvin, S. W., Delcarpio, J. B., Lopez, F. A., McClugage, S. G., … Hollier, L. H. (2007). Survival and recovery: Maintaining the educational mission of the Louisiana State University School of Medicine in the aftermath of Hurricane Katrina. *Academic Medicine*, 82(8), 745–756.

[3] Holzweiss, P.C., Walker, D.W., Chisum, R., & Sosebee, T. (2020). Crisis planning for online students: Lessons learned from a major disruption. *Online Learning*, 24(2), 22-37.

[4] Tull, S., Dabner, N., & Ayebi-Arthur, K. (2017). Social media and e-learning in response to seismic events: Resilient practices. *Journal of Open, Flexible, and Distance Learning*, 21(1), 63-76.

[5] Ayebi-Arthur, K. (2017). E-learning, resilience and change in higher education: Helping a university cope after a natural disaster. *E-learning and Digital Media*, 14(5), 259–274.

[6] Czerniewicz, L., Trotter, H., & Haupt, G. (2019). Online teaching in response to student protests and campus shutdowns: Academics' perspectives. *International Journal of Educational Technology in Higher Education*, 16(43), 1–22.

[7] Beebe, M. (2010). E-learning in Afghanistan. Retrieved from http://erfaned.com/wpcontent/uploads/2018/03/E_Learning_Afg_Maria.pdf

[8] UNESCO. (2020a). What have we learnt? Overview of findings from a survey of ministries of education on national responses to COVID-19. UNESCO, UNICEF, The World Bank. Retrieved from https://inee.org/system/files/resources/National-Education-Responses-to-COVID-19-WEB-final.pdf

[9] World Health Organization [WHO]. (2020). WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020. Retrieved from https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020

[10] World Health Organization [WHO]. (2020). Considerations for public health and social measures in the workplace in the context of COVID-19. Retrieved from https://www.who.int/publications/i/item/considerations-for-public-health-and-social-measures-in-the-workplace-in-the-context-of-covid-19

[11] World Health Organization [WHO]. (2020). Considerations for school-related public health measures in the context of COVID-19. Retrieved from https://www.who.int/publications/i/item/considerations-for-school-related-public-health-measures-in-the-context-of-covid-19

[12] UNESCO. (2020). COVID-19 Impact on Education. Retrieved from https://en.unesco.org/covid19/ educationresponse

[13] Ministry of Health and Social Protection [Minsalud] (2020). Resolución 385 del 12 de marzo de 2020 "Por la cual se declara la emergencia sanitaria por causa del coronavirus COVID-19 y se adoptan medidas para hacer frente al virus. Retrieved from https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDi gital/RIDE/DE/DIJ/resolucion-385-de-2020.pdf

[14] Presidencia de la República de Colombia (2020). Decreto 417 del 17 de marzo de 2020, "Por el cual se declara el Estado de Emergencia Económica Social y Ecológica en todo el territorio nacional. Retrieved from https://dapre.presidencia.gov.co/normativa/normativa/D ECRETO%20417%20DEL%2017%20DE%20MARZO %20DE%202020.pdf

[15] Presidencia de la República de Colombia. (2020). Directiva Presidencial No. 02 de marzo 12 de 2020, "Medidas para atender la contingencia generada por el Covid-19 a partir del uso de las tecnologías de la información y las telecomunicaciones TIC. Retrieved from https://dapre.presidencia.gov.co/normativa/normativa/DI RECTIVA%20PRESIDENCIAL%20N°%2002%20DEL %2012%20DE%20MARZO%20DE%202020.pdf

[16] Ministry of Education MEN. (2020). Directiva Ministerial N° 05 del 25 de marzo de 2020, "Orientaciones para la implementación de estrategias pedagógicas de trabajo académico en casa y la implementación de una modalidad de complemento alimentario para consumo en casa". Retrieved from https://coronaviruscolombia.gov.co/Covid19/docs/decret os/mineducacion/149_mineducacion.pdf

[17] Ministry of Education MEN. (2020). Directiva Ministerial N° 04 del 22 de marzo de 2020, "Uso de tecnologías en el desarrollo de programas académicos presenciales". Retrieved from https://coronaviruscolombia.gov.co/Covid19/docs/decret os/mineducacion/149_mineducacion.pdf

[18] Reinmann, G., Bohndick, C., Lübcke, E., Brase, A., Kaufmann, M., & Groß, N. (2020). Emergency Remote Teaching im Sommersemester 2020.

[19] Brooks, D. C., Grajek, S., & Lang, L. (2020). Institutional readiness to adopt fully remote learning. *Educause Review*.

[20] Mohmmed, A. O., Khidhir, B. A., Nazeer, A., & Vijayan, V. J. (2020). Emergency remote teaching during Coronavirus pandemic: the current trend and future directive at Middle East College Oman. *Innovative Infrastructure Solutions*, 5(3), 1-11.

[21] Mackey, J., Gilmore, F., Dabner, N., Breeze, D., & Buckley, P. (2012). Blended learning for academic resilience in times of disaster or crisis. *Journal of Online Learning and Teaching*, 8(2), 122–135.

[22] Golden, C. (2020). Remote teaching: The glass half-full. Educause review. Retrieved from https://er.educause.edu/blogs/2020/3/remote-teaching-the-glass-half-full

[23] Bates, T. (2020). MOOCs and online degrees continue to grow worldwide Retrieved from https://www.tonybates.ca/2020/09/08/moocs-and-online-degrees-continue-to-grow-worldwide/

[24] Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. *Educause review*, 27, 1-12.

[25] Bozkurt, A. Sharma, Ramesh C. (2020) Emergency remote teaching in a time of global crisis due to CoronaVirus pandemic. *Asian journal of distance education*, 15(1), i-vi.

[26] McCormack, M. (2020). EDUCAUSE QuickPoll Results: Fall Readiness for Teaching and Learning. Retrieved from https://er.educause.edu/blogs/2020/9/educause-quickpoll-results-fall-readiness-for-teaching-and-learning

[27] Craig, R. (2020). What Students Are Doing Is Remote Learning, Not Online Learning. There's a Difference. Edsurge. Retrieved from https://www.edsurge.com/news/2020-04-02-what-students-are-doing-is-remote-learning-not-online-learning-there-s-a-difference

[28] Means, B., Bakia, M., & Murphy, R. (2014). Learning online: What research tells us about whether, when and how. *Routledge*.

[29] Saavedra, J. (2020). Educational challenges and opportunities of the Coronavirus (COVID-19) pandemic. *World Bank Blogs*. Retrieved from https://blogs.worldbank.org/education/educationalchalle nges-and-opportunities-covid-19-pandemic

[30] Czerniewicz, L., Agherdien, N., Badenhorst, J., Belluigi, D., Chambers, T., Chili, M., ... & Wissing, G. (2020). A Wake-Up Call: Equity, Inequality and Covid-19

Emergency Remote Teaching and Learning. *Postdigital Science and Education*, 2(3), 946-967.

[31] Eder, R. (2020). The remoteness of remote learning: A policy lesson from COVID19. *Journal of Interdisciplinary Studies in Education*, 9(1), 168-171.

[32] Sawahel, W. (2020). Union opposes online classes as 'violation of equality'. Retrieved from https://www.universityworldnews.com/post.php?story=2 0200325083138992

[33] Montiel Ariza, H. Martínez Sarmiento, F. H. & Gómez Castillo, H. (2020). Connectivity Characteristics and Level of Acceptance Linked to Online Learning by Higher Education Students During the Confinement Generated by the Covid-19 Pandemic. *International Journal of Engineering Research and Technology*, 13(8),1934-1939.

[34] Reyna, J., Todd, B., & Hanham, J. (2020, June). A Practical Framework to Design Educational Webinars in the Age of COVID-19. In *EdMedia+ Innovate Learning, Association for the Advancement of Computing in Education (AACE)*, 265-271.

[35] Govindarajan, V., & Srivastava, A. (2020). What the shift to virtual learning could mean for the future of higher ed. *Harvard Business Review*, 31.

[36] Paul, J. A., Baker, H. M., & Cochran, J. D. (2012). Effect of online social networking on student academic performance. *Computers in Human Behavior*, 28(6), 2117-2127.

[37] Masood, A., Luqman, A., Feng, Y., & Ali, A. (2020). Adverse consequences of excessive social networking site use on academic performance: Explaining underlying mechanism from stress perspective. *Computers in Human Behavior*, 113, 106476.

[38] Brailovskaia, J., & Teichert, T. (2020). "I like it" and "I need it": Relationship between implicit associations, flow, and addictive social media use. *Computers in Human Behavior*, 113, 106509.

[39] Brailovskaia, J., Schillack, H., & Margraf, J. (2020). Tell me why are you using social media (SM)! Relationship between reasons for use of SM, SM flow, daily stress, depression, anxiety, and addictive SM use–An exploratory investigation of young adults in Germany. *Computers in Human Behavior*, 113, 106511.

[40] Bradbury, N. A. (2016). Attention span during lectures: 8 seconds, 10 minutes, or more?. *Advances in physiology education*, 40(4), 509-513.

[41] Geri, N., Winer, A. & Zaks, B. (2017). A Learning Analytics Approach for Evaluating the Impact of Interactivity in Online Video Lectures on the Attention Span of Students. *Interdisciplinary Journal of E-Learning and Learning Objects*, 13(1), 215-228.

[42] Abboushi, B. Elzeyadi,I. Van Den Wymelenberg, K. Taylor, R. Sereno, M. & Jacobsen, G. (2020). Assessing the Visual Comfort, Visual Interest of Sunlight Patterns, and View Quality under Different Window Conditions in an Open-Plan Office. *Leukos, The Journal of the Illuminating Engineering Society*, 16(4).

[43] Chinazzo, G., Wienold, J., & Andersen, M. (2020). Effect of Indoor Temperature and Glazing with Saturated Color on Visual Perception of Daylight. *Leukos,* 16(4), 1-22.

[44] Bakker, C. Aarts, M. Kort, H. van Loenen, E. & Rosemann, A. (2019). Preferred Luminance Distributions in Open-Plan Offices in Relation to Time of Day and Subjective Alertness. *Leukos*, 17(1), 3-20.