HOW

Remote Learning in Times of COVID-19 in Colombia

Aprendizaje Remoto en Tiempos del COVID-19 en Colombia

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Abstract

Remote learning replaced for almost a year the traditional face-to-face education to maintain and ensure the continuity of the teaching-learning process during the Covid-19 pandemic. This article reports the results of an exploratory and descriptive-transversal study that exposes primary and secondary school students' perceptions about their experience with remote learning during 2020. Though the research study was also aimed at finding out potential teaching and learning issues inherent to remote education, we only focus on reporting the main findings on the determining factors that hindered or enhanced students' learning during their remote education experience. Data were collected through two different surveys addressed to 101 secondary and primary school students from Neiva and Pitalito, the two most populated towns in the state of Huila, Colombia. The findings showed that the

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students' learning was both positively and negatively influenced by several factors affecting interaction inside and outside of the classroom setting.

Keywords: Emergency remote education, COVID-19, learning factors, remote learning strategies

Resumen

El aprendizaje remoto sustituyó durante casi un año a la enseñanza presencial tradicional para mantener y garantizar la continuidad del proceso de enseñanza-aprendizaje durante la pandemia del Covid-19. Este artículo reporta los hallazgos de un estudio exploratorio y descriptivo-transversal que expone las percepciones de los estudiantes de primaria y secundaria sobre su experiencia con el aprendizaje remoto durante el año 2020. Aunque el estudio también pretendía explorar los posibles problemas de enseñanza y aprendizaje inherentes a la educación remota, sólo nos enfocamos en reportar los principales hallazgos sobre los factores determinantes que dificultan o mejoran el aprendizaje de los estudiantes durante su experiencia de educación remota. Los datos se recogieron por medio de dos encuestas diferentes dirigidas a 101 estudiantes de secundaria y primaria de Neiva y Pitalito, las dos ciudades más pobladas del departamento del Huila, Colombia. Los resultados mostraron que varios factores que afectan la interacción dentro y fuera del aula influyen tanto positiva como negativamente en el aprendizaje de los estudiantes.

Palabras clave: Educación remota de emergencia, COVID-19, factores de aprendizaje, estrategias de aprendizaje a distancia

Introduction

Colombia was under preventive isolation for about a year and a half after confirming the first case of COVID-19 in the country on March 6th, 2020. Since then, the Ministry of Education in Colombia (MEN) asked and allowed schools, through Decreto N° 660, to take three weeks to plan a new academic calendar that was adapted to the circumstances. This new reality made schools and teachers come up with new strategies to deliver the lessons by employing what is known as Emergency Remote Education (ERE). This unique learning approach became the only alternative for most students to continue their learning process without putting their safety and health conditions at risk. Nonetheless, this was not an alternative that would easily adjust to students' realities due to a myriad of factors that could conditionate their learning. Despite teachers' efforts to create learning opportunities for students in this new scenario and students' efforts to adapt and follow instructions, several implications and issues arose when assessing their learning progress. Considering this, the present research study focuses on finding out the strategies that students implemented in 2020 to process and adapt to ERE as well as the factors that hindered or strengthened their learning.

No previous local studies had been conducted to learn about student perceptions regarding their experience with remote education during the COVID-19 pandemic. Therefore,

we centered our attention on the students from Neiva and Pitalito to get to know their experiences in regard to this phenomenon. Both Neiva and Pitalito deliver formal education to more than 106.928 students at primary and secondary school levels in public and private institutions.

Literature Review

To achieve a better understanding of the terminology addressed in the research study, theories and approaches from different authors were considered.

Education

Considering that education is a fundamental human right (UN, 1948), we view this process from a social constructivist perspective in which the culture and context are relevant for the construction of knowledge and understanding (Vygotsky, 1980). As clearly simplified by Dagar et al. (2017), "It is the task of education to ensure harmonious and balanced development of the innate power of an individual by providing a nurturing and conducive environment for their growth and development" (p. 8). When the required setting is not present, education, which is viewed as an active cognitive construction through social interaction, can present challenges, difficulties, and conflicts among the educational community. One of those recurring and evidently complex issues in education has been the shift from traditional face-to-face education to remote education because of the sanitary emergency caused by the COVID-19 pandemic in 2020.

Emergency Remote Education (ERE)

According to Bozkurt et al. (2020), ERE refers to using all resources available, online, and off-line, in a time of crisis for education to endure regardless of the current outlook. To understand the implications of ERE, we explain Emergency Remote Teaching (ERT) and Remote Learning (RL) separately as follows:

On the one hand, Castañeda-Trujillo & Jaime Osorio (2021) "…ERT should be understood as the first attempt to do online teaching without adequate time and preparation due to the unexpected and drastic changes in the circumstances of the educational modality." (p.600). ERT has been facilitated through technology in several ways such as video conferencing, webinars, learning management systems, mobile and radio learning, among others; it can also be implemented in two ways: synchronously or asynchronously (Perveen, 2016). On the other hand, as proposed by UNESCO (2020), RL is a way to ensure continued learning for students when a situation is delaying them from coming back to their normal education environment.

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Nevertheless, due to the ongoing educational and economic inequality in Colombia, there were 14.000 schools that had a challenging period trying to adapt to this new way of instruction delivery method (Peñafort & Pereira, 2022). Ray (2020) highlights that even though RL provides the opportunity to continue developing the educational content through technology, its effectiveness depends on "preparedness, technology tools, and overall student support infrastructure" (p. 4). In this regard, a study conducted by Acevedo-Tarazona et al. (2021) points out that the government implemented alternatives to enhance the ERE such as the broadcasting of educational programs on radio and television, the distribution of pedagogical and technological supporting materials in hard-to-reach areas, the possibility of counseling and training support for parents and teachers, among other initiatives. Nevertheless, these authors also suggest that despite all these efforts, the pandemic unveiled several limitations in terms of digital infrastructure, socioeconomic conditions, and social and emotional conflicts among teachers and students that continue to fail in ensuring the quality of education. These limitations go hand in hand with the learning factors faced by students during the pandemic that either hindered or enhanced their learning process.

Learning Factors

Different factors such as social interaction, family support and guidance, socio-economic context, and age might affect the learning process. As suggested by Slameto (2010, as cited in Munawaroh, 2017) the learning outcome and success are determined by several factors, which are divided into *internal factors* that are the ones that prevail in learners including physical and psychological factors, and *external factors* that go beyond the learning including "family factors, school factors, and community factors" (p. 667). Those internal and external learning factors, and research studies suggested in this theoretical framework (e.g., Munawaroh, 2017; Ray, 2020; Khlaif et al., 2021) helped us understand remote learning from the perception of students, especially concerning the factors that affected their learning. Regardless of all these challenges and difficulties faced during the pandemic, students managed to develop and implement learning strategies that helped them cope with ERE and its implications.

Learning Strategies

Ortega (2014) defined learning strategies as those cognitive procedures that individuals have to gain domain of their learning process. In the same line of thought, Weinstein and Mayer (1986) refer to learning strategies as those behaviors and thoughts that learners develop during the learning process. These strategies aim at influencing the learning process while affecting learner's motivation and "...the way the learner selects, acquires, organizes, or integrates new knowledge" (p. 315). Likewise, every student can develop learning strategies that vary according to their learning styles. Regarding the current situation, learning strategies related to the use of technology have become more suitable for learners since the pandemic

started. As implied by UNESCO (2020), students should have a balance on using what they have access to immediately, which means embracing remote learning solutions or strategies based on the current technology available.

Methodology

This study took place between July 2020 to July 2021. It was conducted under the parameters of a mixed method approach, and it followed a transversal exploratory and descriptive research design (Hernández Sampieri et al., 2014). This research design intertwined the variables that appropriately allowed exploring, formulating, and describing a new phenomenon that had limited scope in the literature.

Participants

The participants were 101 students. 73 were enrolled in secondary education and 28 in primary education. 87 out of the 101 students were from Neiva and 23 from Pitalito. Approximately 70 students were part of the private sector. The average age of primary school students was 8 years old; the average age for secondary school students was 15 years old. Likewise, 59% of the participants indicated that their socioeconomic strata was 2, . Finally, 53% of the participants were women, and 47% were men. The survey was openly distributed to students from Neiva and Pitalito and since all the participants were underaged, the survey contained a form that allowed them and their legal guardians to know about the purpose of the study and the ethical considerations before consenting their participation.

Data Collection

We collected data by means of two online surveys; one applied to secondary school students, and the other to primary school ones. The differences between the instruments relied on language and reduction of three items in the primary school survey. The instrument for secondary school level had fifty-one items, while the one for primary school level had 46. Both open and closed questions were included. Each instrument contained an informed consent, and seven areas of study as follows: Demographic data, network connectivity data, students' knowledge of the use of digital media for the development of remote classes, schedule and academic area, strategies for the development of remote classes, welfare area, and students' suggestions for the improvement of remote classes. These areas were selected because of their strong relationship to the research objectives. Each of the items was revised and validated by a panel of experts. Students whose parents consented participation, answered the survey while being at home due to the national confinement at that time.

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Data Analysis and Findings

We followed the strategy proposed by Creswell (2009) of the concurrent triangulation design to analyze the information. We considered three main sources of information: document review, quantitative, and qualitative data. We also followed an inductive-interpretative process to create codes and groups (Creswell, 2012). After gathering the data through SurveyMonkey, we exported the results to an Excel spreadsheet and separated quantitative and qualitative data for analysis. Quantitative data were analyzed by means of descriptive statistics and qualitative data were grouped into themes according to the research categories derived from our research objectives. This was a strategy to label the perceptions that better answered the purpose of this study in connection with theory (Corbin & Strauss, 2008).

On that account, the information is presented with its corresponding findings and relevant comments from the participants that support the missing gaps such as the unequal learning opportunities, school necessities, and the creation and implementation of educational policies that acknowledge the challenges that prevail in Colombia due to lack of governmental context sensitivity and action. This information contributes to the more profound understanding of a current educational phenomenon: remote education. Subsequently, two categories were organized according to our main objective.

Research Categories

The following categories presented in Figure 1 below provide an answer to the main objective of the research study presented in this article. Each category portrays the data gathered from the participants regarding the factors that affected their learning in a remote learning environment.
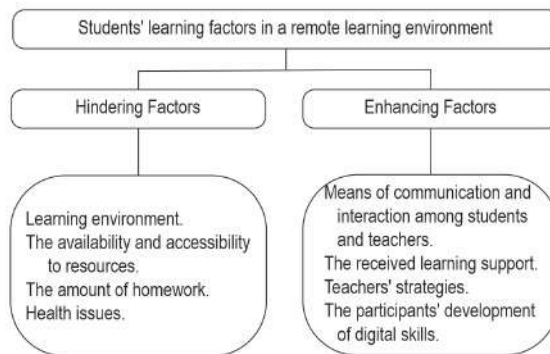
Figure 1. Research Categories

Students' Learning Factors in a Remote Learning Environment

As previously stated in the theoretical framework, several factors may affect students' learning outcome and performance specially when there have been abrupt changes and adaptations in the educational field. Findings in this study indicate that specific scenarios either obstruct students' performance and academic achievement (*hindering factors*) or facilitate it (*enhancing factors*) to attain remote learning requirements.

Factors that hinder students' learning. In this subcategory, we discuss how the participants experienced remote education while focusing on the internal and external factors that hindered their learning. Factors that hinder students' learning process were analyzed and associated with the implications of having more than one person taking remote classes at home, the amount of homework, and students' health issues as a result of the extended class hours and schedules during remote education.

As presented in the literature, several factors can affect students' learning negatively. UNESCO (2020) pointed out that the most common hindering factors regarding students' learning have to do with the use of platforms, learners skills, health issues, and accessibility and availability of resources. In addition, for this study, we found that 85,8% of the participants were having remote classes with more than one person being part of remote scenarios as well at their houses.

In that sense, we believe that there are implications regarding the number of people taking remote classes at the same time at home. One of them involves internet use. According to Adnyani et al. (2020), Wi-Fi speed for educational platforms is rather slow, and sometimes it demands students to use their own internet data. This implies that students may have to participate in the remote lesson at another time or use a different connection to have better accessibility, assuming that this could be a viable option for them. In this regard, Khlaif et al. (2021) conducted a study that reports the importance of a stable and reliable internet connection for remote learning to take place. These authors also highlight that infrastructure in regards to availability of devices, internet and technical support is necessary to engage students and teachers in remote settings. In the case of our study, if learners do not have another choice but to use the same network as the other people they live with, their learning might be compromised as they are not able to be fully engaged with the lessons because of poor connection and interference.

Additionally, another implication is that students' learning environment is also affected by the number of people taking remote classes in the same living place. Matrapendidikan (2013, as cited in Munawaroh, 2017) suggests that providing a quiet and comfortable learning environment is essential for learners to focus on the lessons and understand them thoroughly. Due to the reality of the time, taking classes from home implied that students had to deal

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with a variety of distractions. Therefore, students felt disconnected from their class and their capacity of engagement was more likely to be disrupted, as it was expressed by one of the participants in our study:

> "At home there are many distractions; the computer, chats, social networks and that is something that should not happen, at school we are always focused and attentive to everything." (P43RS40)

Equally relevant, since a stable learning environment, motivation, and tolerance are necessary features for students to adapt to RE, establishing the relationship between being technologically prepared to attend remote classes and being cognitively ready to do so is pertinent. Students may have the required tools and resources to attend the classes, but they might not be under the adequate conditions to fully engage with the classes due to the lack of the above-mentioned features.

Moreover, for 87.2% of the participants, the number of available devices at home to attend the remote sessions was enough. Furthermore, as suggested by Ullah and Ali (2021), private schools make every effort to guarantee students' learning and its continuity during remote education whilst the public sector takes longer to ensure this for students. Like this, Yasmeen et al. (2015) highlighted that "it is evident that the private institutions are better equipped with respect to the availability of equipment" (p. 6). Having said that, highlighting the likelihood of students from private schools to develop a better performance and knowledge than the students from public schools, who lack the resources to perform adequately, is essential.

Conversely, 12,8% of the participants stated that the number of devices was not enough to attend remote classes. The participants were expected to perform and deliver an outstanding performance even though their ability to complete tasks and engage with classes was compromised by external factors such as availability of technological devices. We can agree that it represents a more challenging scenario for students to be part of remote classes when the required devices and tools are not available at home. Even though we highlight the importance of that before, we acknowledge that all those who do not have these resources continue to pursue education either way. The outcome of these students that are not equipped according to the standards (e.g., good connectivity, computer, and technological devices) manifests in the low performance and capacity to attain the set of requirements established in the remote classroom.

To add further analysis to the rigorous responsibility that remote education requires on students, 73,3% of the participants who answered the survey believe they are required to complete more academic assignments than in the past, which leads them to devote more time and abilities to accomplish the goals established. On the other hand, only 26,7% of students believe that the number of workshops and homework have not changed as a result of remote education.

The amount of homework that a student should do to achieve the goals in school depends on the age and grade in which the student is. According to Hardy and Boaz (1997, as cited in Valentine, 2002), when it comes to remote learning environments, students are required to be more engaged, organized, and independent, compared to a face-to-face learning environment. Nonetheless, these characteristics are rarely found in students from primary and secondary school. Consistently, students in secondary school might manage the time devoted to performing and developing their homework more effectively in comparison to the primary level. However, the fact that they perceive that the amount of homework is constantly increasing for them, might result in a triggering factor linked to stress and anxiety.

Another hindering factor presented in our findings is related to health issues in students. One of the most relevant and worrying issues is the constant physical pain and discomfort that students may have experienced during remote classes. In fact, 56% of the participants stated that because of remote education, they have presented health issues such as headache or backache. The most common health issues among students as a result of spending too much time on the screen are headache: 33%, eyes fatigue: 30%, backache: 27%, among others such as fever, tiredness, constipation: 10%, which may negatively impact the learning process of the student and their wellbeing. Here we present two students' excerpts that better illustrate this hindering factor:

> "Headache, stress, burning eyes, back pain, tiredness, body aches, fever. (All this from being on the computer for so long), before I was only at the computer for one or two hours, but now I have to be at least 6 and those are only during class hours." (P38RS40)

> "Sometimes burning eyes from spending too much time at the computer and also headaches due to accumulated stress because there were times when I had too much homework for the same day or the same subject." (P28RS18)

According to Mangis (2016), spending an extended time on the computer presents a major risk to a person's physical and mental health, resulting in the lack of active leisure pursuits and recreational sports which lead us towards sedentary activities such as watching television, playing video games, and spending time on computers. Since children used to be told to stay at home and to attend their classes remotely, what Mangis (2016) describes as a sedentary life was a reality for children from Neiva and Pitalito.

As already presented in the literature, the health condition plays an important role in students. Oliveira et al. (2021) suggest that as students continue learning from home, they are more sensitive to suffer from negative reactions and deficiencies in mental health such as "anxiety and depression as a result of missing friends and isolation" (p. 4). Nonetheless, the possibility of suffering from physical problems is not being left behind due to the discomfort caused by spending hours online or looking at a screen. Now, physical symptoms are not the only one present in students' lives; the pandemic has also brought other implications on

students' mental health such as the lack of motivation and high stress levels. When there is lack of motivation in students, apart from facing difficulties finding the sense of the meaning of life, they also find it difficult to remain focused, organized, or dedicated to what they do daily. The pandemic increased the need for social isolation and a switch to the way most people used to live. Additionally, Deci and Ryan (2008) pointed out that motivation can be affected by social constraints and interaction. In other words, when the need for social interaction is not met, the motivation of people is significantly affected, being this one an essential factor for learning outcome and performance.

Factors that Enhanced Students' Learning. Even though the transition from face-to-face classes to remote ones has brought negative consequences on student's learning, this subcategory is aimed to highlight aspects, strategies, and factors that improve and reinforce the students' performance in the remote learning scenarios. The implementation of strategies and sources such as channels of communication, the received learning support, teachers' strategies, and the participants' development of digital skills have also contributed to student's learning. This is why, to amplify the exploration of this subcategory, we present the subsequent analysis supporting the responses of the participants and the views of other researchers that contribute to this finding.

Due to the need to secure effective communication for the development and interaction of a class, a set of platforms and applications were chosen and developed. This contributed to a more profound understanding of a subject and allowed students and teachers to remain in permanent contact from home so that the learning processes could continue. According to the responses from the participants, due to its accessibility and efficacy, the most popular way of asynchronous communication between teachers and students was WhatsApp, (53,2%, as it is presented in Figure 2 below). It has shown to prevail among students and teachers as a powerful digital tool when communicating and interacting as it is the one of the most used apps for instant messaging in Colombia. Followed by this was email with 32.9% and YouTube with 13.9%, being these three the most used platforms for communication among teachers and students.

As interaction in the classroom was changed and reevaluated, teachers had to come up with different resources and ideas to overcome the screen distance. It was a matter of concern for teachers to decide which type of app or platform to use because it would determine the accessibility and capability for students to join and understand the material. As stated by Kholis (2020), teachers need to choose an appropriate app in accordance with the students' needs and consider different accessibility aspects such as "virtual meetings, delivered materials, tasks and assignments, learning facilities, and evaluation" (p. 27). To do so, teachers created and implemented different strategies that had contributed to the development of students' interactions and performance, while motivating them to participate throughout different activities. The implementation of videos in the classes was reported to be one of the best strategies to cope with attention and motivation in times of remote education
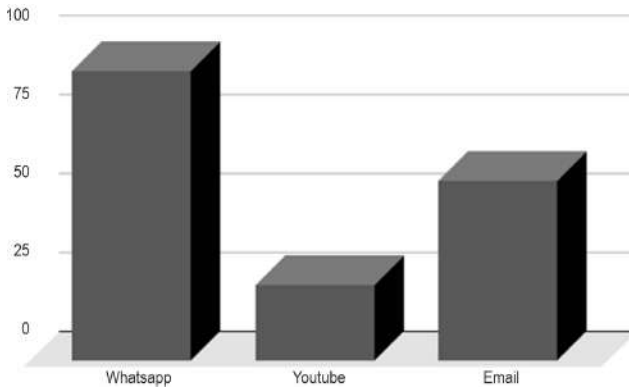
Figure 2. Means of communication and interaction used by the participants
with their teachers and peers.

according to 74.26% of the participants. Based on the previous information, here we present three students' excerpts:

"They play videos and then ask us about the video." (P26/RP20)

"Educational games making a review of the topic seen, video tutorials and tests." (P28/RS02)

"They (teachers) explain to us virtually through applications such as YouTube or through videos that they record themselves." (P28/RS12)

Furthermore, as stated by Bevan (2017), "studies evidenced that the use of videos, permit for more efficient processing and memory recall. This type of material helps the student to get and process the information in a way that's natural to them. In a nutshell, videos are good teachers" (para. 4). As we are living in a digital era, it is noticeable that the strategies involved with the use of technology and digital resources are more effective and efficient in the current generations.

Moreover, as another enhancing factor, parent support played a crucial role in the participants' learning process. In the case of primary school students, 74,3% of the students stated that help was needed to cope with the instructions given by teachers or technological issues in remote sessions. Secondary school students, 45,3%, also agreed with parent support during remote classes; however, almost half of the participants showed that they did not need help from adults, especially students from the secondary level since they showed an interest in overcoming situations on their own without any support. According to students in secondary school:

"I would not like it because I believe that we can solve our doubts." (P35/RS4)

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"No, the truth is that I've already been raised like this and I don't need help from someone else." (P35/RS19)

Due to the pandemic, parents must take on new and unfamiliar roles and responsibilities as their children participate in remote education while experiencing increasing instructional responsibility for their child's learning (Liu et al., 2010). Through her study, Boulton (2008) found out that children enjoyed having parent support, but at the same time, parents did not really know what role they should play in online learning.

Finally, regarding the development of digital skills, Figure 3 shows that before the pandemic, a few participants had previous knowledge about the use of technological devices such as computers, cell phones, or even tablets. 48% of students knew how to use a computer with all its characteristics, nonetheless, 20% said that they poorly knew how to use the computer correctly.
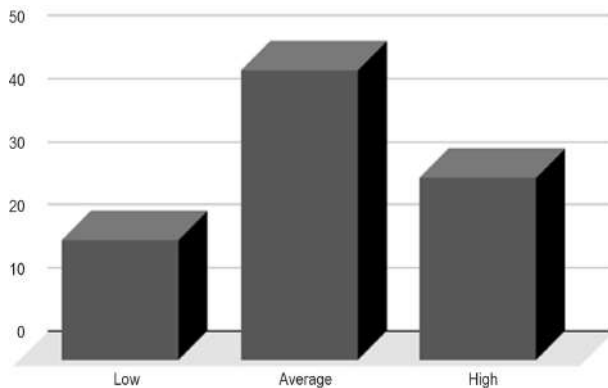

Figure 3. The level of participants' digital skills in using the computer
before remote classes.

Consequently, as presented in Figure 4 below, since most students were required to attend classes at home throughout the use of an electronic device, 71% of them stated that after having experienced eight months of remote classes, they have an outstanding use of the computer. This shows how participants' development of digital skills have also contributed to their learning process.

Conclusions

At the beginning of 2020, the COVID-19 brought challenges to the teaching and learning in many schools around the world, one of them being the shift from traditional face-to-face
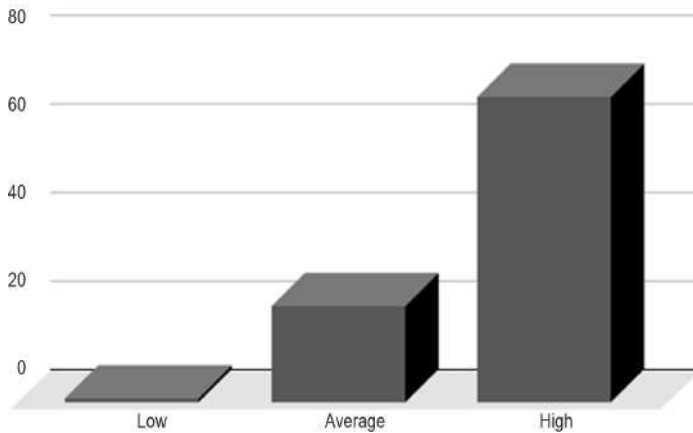
Figure 4. The level of participants' digital skills in using the computer after having experienced eight months of remote classes.

to remote classes. This transition was not easy, especially for those in countries like Colombia in which there was no previous preparation or awareness on remote education practices, and in which the student population with no computer at home was around 67% in 2018 (De Zubiria, 2020). Our main aim with this study was to explore Neiva and Pitalito students' perceptions regarding their experience with remote learning to have a better understanding of the experience, challenges, and difficulties faced after this sudden transition to a remote environment.

Among the factors that hinder students' learning, we found that their learning environment, the quality of the internet connection, and accessibility of resources affected them both positively and negatively; depending on the side of the gap they stand on: public or private education. First, if the accurate setting and resources are not provided, it triggers students' performance to be low or poor, hence students who have enough resources and internet connection to attend lessons are perceived as better candidates to achieve learning in remote times. The students' environment also affects their motivation, level of attention, and concentration since they do not only need one ability, strategy, resource, or tool to accomplish the learning goals at remote education; it is the correlation between them that would make it possible to have a successful learning outcome and performance. Nevertheless, teachers' capacities to guide students in remote scenarios is also a crucial aspect to move forward in achieving learning targets.

In regard to the learning environment, findings reported that students' learning might be affected negatively due to disengagement, internet connection issues and poor accessibility

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and exposure to digital tools. Additionally. results revealed how the number of assignments was negatively perceived among the students since the majority of them (73,3%) manifested an increase on what they had to do after class. Although secondary school students demonstrated to cope better with the assignments, it was found that the primary school students required an adult's supervision or help to complete them. Thus, it is relevant to highlight the importance of parents and legal guardians' support since it becomes another factor that may hinder or enhance learning when it comes to remote education. On this matter, teachers should consider and reflect on the idea that being flexible with the amount of homework and supporting students in the learning process is not related to a decrease in the level of efficiency and demand of the lessons, but it is more aligned with ensuring that students become aware of their adaptation process so that they can accurately reflect on their performance in a remote education environment.

Moreover, another concern in regard to remote education has to do with health issues. Findings showed that spending so much time in front of a screen can result in a variety of physical and psychological issues, such as headache, eye strain, backache, fever, tiredness, constipation, and lack of motivation. The abrupt shift from face-to-face education to ERE compromises aspects that force student's bodies and emotional health to drift, producing the negative effects that have been mentioned. We also highlight that the required levels of social interaction to enhance cognitive development in students were not encountered due to the pandemic restrictions; consequently, the level of motivation on students decreased, creating a higher likelihood of suffering from high-stress levels and mental issues.

These findings triggered motivation and health issues that compromised students' learning during the pandemic. Nonetheless, this study also revealed positive results such as the impact of the channels of communications and platforms used by students and teachers such as WhatsApp, E-mail, and YouTube, since they helped students develop digital skills and knowledge on the matter.

Finally, as researchers, we want to extend an invitation to educators and teachers to reevaluate their practices and to innovate in every possible way so that the teaching and learning practices can be transformed in the future. Veletsianos and Houlden (2020) suggests that there is a need for radical flexibility education that leads us to think about the issues that the pandemic makes distinct. In other words, we must learn from what we are currently experiencing for improvement purposes.

The findings and conclusions from this study cannot be taken as the overall situation in Huila, Colombia, or other regions and countries around the world. Then, it is essential for other institutions, communities, towns, regions, and ethnicities to be considered for further research that can lead to a more complete exploration of the students' perceptions on remote learning. We conclude this research study by reaffirming how important it is to conduct

research on such phenomenon presented in education around the world as a consequence of the COVID-19 pandemic, which can lead teachers, students, policy makers, and stakeholders in general to have a broader perspective and idea of the aspects to be improved and solved for the current and future situations.

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