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covid-19 and ecuadorian education a chasm Digital

El covid-19 y la educación ecuatoriana un abismo Digital

Luis Enrique Vargas Párraga[1]
Vanessa Monserrate Vargas Párraga[2]
Katiusca Katerine Macias Avilés[3]
Gabriela Katiuska Ortega Chávez[4]

Abstract

The COVID-19 crisis has forced the closure of schools worldwide, severely disrupting the learning process of millions of children, youth and adults. Objective. Identify, based on the need to provide, in public education that deserves a constant quality of care that always responds to the needs of students and a high competence in managing technological resources. Methodology. We conducted a systematic review of technical reports, consensus statements, guidelines and documents that provide on National Multipurpose Household Survey of INEC and COVID-19. This research is of a mixed type: quantitative and qualitative, cross-sectional, analytical-descriptive, exploratory and correlational. In the correlational or inferential analysis, a Pearson chi-squared test was used to determine the predictive factors of Internet access against the system (questionnaire 1). A value $p<0.005$ was considered significant. Results. The relationships found between the different levels of

1 Magister, Universidad Laica Eloy Alfaro de Manabí, Manta, Ecuador, luis.vargas@uleam.edu.ec, https://orcid.org/0000-0002-8698-894X

2 Magister, Universidad Laica Eloy Alfaro de Manabí, Manta, Ecuador, vanesssa.vargas@uleam.edu.ec, https://orcid.org/0000-0002-5452-5449

3 Magister, Unidad Educativa Manta, Manta, Ecuador, katt.macias@gmail.com, https://orcid.org/0000-0001-7784-0831

4 Magister, Universidad Laica Eloy Alfaro de , Manabí Manta, Ecuador, gabriela.ortega@uleam.edu.ec, https://orcid.org/0000-0003-4940-1051

Internet access, as well as the cumulative effect of technical resources and digital literacy levels on the academic use of the Internet. Likewise, it was observed that the influence of the student's family status lost strength as the level of access to bandwidth and the different types of connection that can be used increased.

Keywords: Religiosity; Spirituality, Breast Cancer, Women, Diagnosed patients, Surviving patients.

Resumen

La crisis del COVID-19 ha obligado a cerrar escuelas a nivel mundial, interrumpiendo gravemente el proceso de enseñanza aprendizaje de millones de niños, jóvenes y adultos. Objetivo. Identificar en base a la necesidad de aportar, en la educación pública que merece una constante calidad de atención que responda siempre a las necesidades de los estudiantes y una alta competencia en gestión de los recursos tecnológicos. Metodología. Realizamos una revisión sistemática de los informes técnicos, declaraciones de consenso, directrices y documentos que proporcionan sobre Encuesta Nacional Multipropósito de Hogares del INEC y el COVID-19. Esta investigación es de tipo mixta: cuantitativa y cualitativa, de corte transversal, tipo analítico descriptivo, exploratoria y correlacional. En el análisis correlacional o inferencial, se empleó una prueba Pearson chi al cuadrado para determinar los factores predictores del acceso a internet frente al sistema (cuestionario 1). Un valor $p<0.005$, se consideró como significativo. Resultados. Las relaciones encontradas entre los diferentes niveles de acceso a Internet, así como el efecto acumulativo de los recursos técnicos y los niveles de alfabetización digital en el uso académico de Internet. Asimismo, se observó que la influencia de la condición de familia del estudiante perdía fuerza a medida que aumentaba el nivel de acceso al ancho de banda y los diferentes tipos de conexión que se pueden usar.

Palabras clave: COVID-19; Trabajo en Casa; Educación; Acceso a Internet; Uso de Internet

Introduction

In relation to the problematic reality at the global level, educational institutions play an important role in promoting regional development, since they are institutions that are very close to the population and therefore know their main problems and needs (Benítez et al., 2020). In order to help the inhabitants of their jurisdictions, a significant amount of money is allocated to them but for various reasons and management

problems it is not invested in meeting the immediate requirements of the community(Suárez, Chéné, & Jiménez, 2016).

The presence of the Internet is increasingly evident in social relations, economic transactions and production processes in Ecuador (Joslin, 2020). The growing activity on the Internet is a reflection of the economic, social and cultural activities and relations that exist outside the network, including inequalities(Luthe, Wyss, & Schuckert, 2012). In this sense, ownership of technology by the population is a factor of social inclusion(Cranford & Mourato, 2014). Arguments that the Internet has had an effect on social inclusion are reflected in the "digital divide". This type of study is related to research on Internet access related to sociodemographic variables. As physical access to the Internet has been relatively overtaken in developed countries(Suárez et al., 2016), other types of access have been gaining attention in digital divide studies.

The COVID-19 pandemic has forced the closure of educational institutions around the world, severely disrupting the teaching and learning process for millions of children, youth and their families. With the pandemic slowing, governments are now developing the next steps in their strategy to deal with a crisis of unprecedented scope (Rivera-Vargas & Romani, 2020). In many countries, this involves planning for the safe reopening of schools, colleges and universities, which has taken various forms. Some countries, such as France or Germany, have already welcomed students back, while others, such as Spain or Italy, will keep school doors closed until September(Erokhin & Gao, 2020). Despite these different reopening schedules reflecting national preferences and contexts, there is a broad consensus on the need to analyze and evaluate the consequences of school closures(Corral & Gatti, 2020).

Country representatives attending the annual meeting of the OECD Education Policy Implementation Project expressed particular interest in measuring the potential learning loss associated with the closure of educational institutions(Rahman & Farhana, 2020).

The Ecuadorian government suspended on-site school activities due to the health emergency caused by the coronavirus pandemic (Covid-19). Four days later, the Ministry of Education, as the governing body of the national education system, presented the "Plan Educativo COVID-19(Vivanco-Saraguro, 2020) and Barros Bastidas, C., & Turpo Gebera, O. (2018).

One of the government's proposals is Learning Together at Home", and with it confirmed the decision to continue the educational processes through the non-face-to-face modality (teleducation)(Corral & Gatti, 2020).

The training of most public teachers still lacks sufficient information on how these processes are being developed at different school levels. However, the errors of the process in the online educational environment bring queue from family members and staff of educational institutions (Rivera-Vargas & Romani, 2020).

Authorities, teachers, students and parents make enormous efforts to respond to the demands and requirements of non-classroom education. "However, differences such as the socioeconomic level of families, demographic conditions, low levels of coverage and internet access, lack of technological resources, parental support in the educational process, among many others"; are the subject of multiple debates in the current situation due to the closure of educational institutions (Ch, Batool, & Bashir, 2020).

A new disadvantage for students from the lower, lower-middle and middle strata, given their limitations to the continuity of their education through the non-face-to-face modality. This toolkit provides education system leaders with an application framework and questions to consider in developing their educational responses to the COVID-19 crisis (Bragazzi et al., 2020).

It is based on an analysis of educational policy measures taken during the initial stages of the COVID-19 crisis. What dimensions should be considered for the implementation of educational responses to the COVID-19 crisis? Lessons learned show that emergency strategies such as those triggered by the COVID-19 crisis must take into account some constraints: fixed initial contextual factors, limited available evidence, and lack of time for capacity building(Erokhin & Gao, 2020).

The implementation of an educational response to the COVID-19 pandemic that supports equity, quality, and well-being must build on the capacity of schools and education professionals, as well as available technological resources(Chang & McAleer, 2020). Stakeholder involvement in the development of a broadly supported overall solution may need to be limited initially to key players and integrated at later stages, as there is an optimal balance between participation and reactivity(Nicolalde, 2020).

In Ecuador, only "37% of households have internet access, which means that 6 out of 10 children cannot continue their studies through digital platforms. The situation is more serious for children in rural areas, only 16 percent of households have this service" (Bonilla-Guachamín, 2020a).

However, in the "country 9 out of 10 households do have a television or cell phone, which is an alternative to reach children through these media" (Molina-Ríos & Pedreira-Souto, 2020). Anna Vohlonen, Education Specialist at UNICEF Ecuador, tells how these mechanisms and other tools can be used to ensure that children continue learning in this context (Rodenbiker, 2020).

Table 1.
Home technology equipment at the national level

Period	Desktop computer	Laptop computer	Desktop and laptop computer	Fixed telephony	Cellular telephony
Dec-07	20,29	-	-	35,52	-
Dec-08	22,84	-	-	37,10	-
Dec-09	23,37	-	-	35,64	-
Dec-10	24,01	9,00	6,05	38,49	49,68
Dec-11	24,71	9,81	5,76	39,92	78,83
Dec-12	26,41	13,86	8,05	42,37	81,67
Dec-13	27,50	18,06	9,86	39,55	86,42
Dec-14	27,06	20,60	10,16	38,25	89,70
Dec-15	27,66	24,76	11,58	38,93	89,54
Dec-16	26,73	27,60	11,98	38,40	90,10
Dec-17	25,88	26,00	11,16	36,95	90,66
Dec-18	24,47	24,19	11,23	-	-
Dec-19	23,28	28,47	11,17	35,57	91,01

Source: National Multipurpose Household Survey, December 2018 and 2019.
Prepared by: National Institute of Statistics and Census - INEC

But policy can actually be based on schools having scope to design their own approaches, following the shaping of a national or regional vision, generic health and education guidelines, and the provision of support to those who need to manage inequalities(Scheerder, van Deursen, & van Dijk, 2020). An effective implementation strategy will bring these dimensions together and make them feasible in terms of timelines, responsibilities, instruments, and available resources(Rodrigo-Mendizábal, López-Jiménez, & Arribas-Urrutia, 2020).

Table 2.
Percentage of households that have Internet access

Period	National	Urbana	Rural
Dec-08	7,04	9,93	0,90
Dec-09	7,65	10,96	0,67
Dec-10	11,75	16,66	1,30
Dec-11	16,86	23,65	3,54
Dec-12	22,49	31,37	4,75
Dec-13	28,27	37,03	9,14
Dec-14	32,44	40,39	14,57
Dec-15	32,80	40,99	13,73
Dec-16	36,03	44,60	16,41
Dec-17	37,20	46,08	16,62
Dec-18	37,17	46,56	16,07
Dec-19	45,54	56,11	21,64

The management of requirements of the needs in the education sector is a fundamental pillar in the mechanisms of efficiency in the management of institutional purchases and guarantees an optimal and quality attention of public and private services (Salirrosas, 2016). However, one of the tangible problems of service quality lies in the deficit of timely actions by the generators of requirements, who do not make their purchase order as scheduled in the table of needs of the education area at the whole government level(Sharma & Daugbjerg, 2020).

Resulting in administrative disarray while hurting other schools during that period, distance learning solutions, such as online classrooms, television and radio broadcasts, and computer-assisted learning, were implemented to bridge the gap between schools and students, but the overall impact on learning remains uncertain(Del Brutto, Mera, Recalde, & Costa, 2020).

Materials and methods

The objective of this research is to identify the need to contribute to public education, which deserves a constant quality of care that always responds to the needs of students and a high competence in the management of technological resources.

The research applies as logical methods: deduction and induction. The former consists, according to Behar (2015) "in the analysis of general theories leading to

specific hypotheses or ideas". The second consists, according to the same author, "in the use and calculation of particular facts that must culminate in global conclusions."

Indeed, the research starts from the general description of the problem, starting from the state of the art, converging towards the global and specific theories on the variables, to lead to the methodological aspect inherent to the particular results; however, deduction gives way to induction, when the findings obtained are taken and represented through conclusions, which should establish the fulfillment of the objectives and identify the relationship between the management of medical supplies requirements and the level of user satisfaction.

This is a mixed research: quantitative and qualitative, cross-sectional, descriptive analytical, exploratory and correlational. The study population of this research was constituted from the Multipurpose Survey is guaranteed, at national and area level, the sustainability and comparability of information with the ENEMDU, which was previously used as a source of ICT indicators (Ministry of Telecommunications and Information Society, 2019).
The implementation of the Multipurpose Survey had the technical support of the Economic Commission for Latin America and the Caribbean (ECLAC) and the National Institute of Statistics and Geography of Mexico (INEGI)2 for the sample design of the survey and the construction of collection instruments, respectively (Alcázar Ponce, 2019).
The Survey addresses topics such as education; information and communication technologies; perception of discrimination; victimization; housing characteristics and household structures; use, trust, functioning and satisfaction about the services provided by public institutions(Multiprop, 2019).
It is a technique used in the study to scientifically prove the reliability of the questions according to the research objectives, starting with the elaboration of the questions based on each objective.

Each of the questions is classified with each objective, the validity, which is established according to the type of result that will be achieved with the analysis of the possible solution to the problems and Coherence, which is determined by the clarity of the answer, knowledge and content.

Results

The treatment of the information began with the recoding of the scientific research variables in Microsoft Excel for the processing and debugging of the information.

Subsequently, the analysis of the primary base was carried out in Excel in the SPSS V24 statistical program, with the purpose of observing the distribution of the data in relation to the frequencies of the categorical variable, as well as the mean, as a measure of central tendency and standard deviation, as a measure of dispersion, of the continuous numerical variable.

Table 3.
Percentage of people who are digitally illiterate

Period	National	Area	Urbana	Rural	Sex	Man	Woman
Dec-08	32,42		22,95	53,81		28,61	35,95
Dec-09	33,60		25,34	52,32		30,23	36,81
Dec-10	29,22		20,83	48,02		26,28	32,07
Dec-11	25,14		17,68	42,37		22,17	27,91
Dec-12	21,38		15,07	35,62		18,97	23,70
Dec-13	20,04		15,47	30,57		18,13	21,89
Dec-14	14,43		9,80	25,01		12,02	16,70
Dec-15	12,22		7,39	23,48		10,09	14,24
Dec-16	11,45		6,85	21,99		9,37	13,45
Dec-17	10,48		5,99	21,24		8,92	11,96
Dec-18	10,68		7,17	18,98		9,61	11,72
Dec-19	11,39		7,80	20,05		10,63	12,13

The variables will be plotted as follows: for categorical variables a bar chart or pie chart will be used and for numerical variables a histogram will be used.

The importance of households having Internet access lies in the fact that it is potentially available to all household members, including those without ICT skills, as other household members can help them, for example, to search for information, thus improving ICT literacy.

At the national level, there was a significant increase of 8.4 percentage points in the percentage of households with Internet access. Similarly, in urban and rural areas there was a significant increase of 9.54 and 5.56 p.p., respectively.

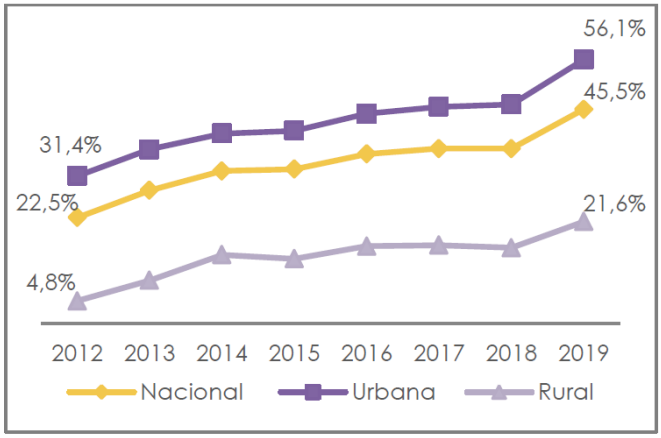

Figure 1. Evolution of the percentage of households with Internet access, by area (2012-2019).

Table 4 shows the changes in the percentage of people using computers, by area, between 2018 and 2019.

Table 4.
Percentage of people using computer, by area (2018 and 2019).

Área	2018	2019	Variación significativa 2018 y 2019
Nacional	50,1%	41,0%	Si
Urbana	55,6%	46,6%	Si
Rural	38,2%	28,9%	Si

Fuente: Encuesta Multipropósito (2018 y 2019).

To present the main theoretical and empirical background underpinning this special issue, we have proposed and developed three main questions that provide a framework for the current context in which digital technology inclusion initiatives are designed and implemented in educational contexts(Lallie et al., 2020).

To understand from an analytical perspective the different types of educational and technological initiatives, it is useful to consider the critical works available in the field. Many of these works have highlighted the need to counteract the enthusiasm generated by digital technologies in the education sector with a more critical analysis that highlights and counteracts the inertia of the digital, defending alternative ways of understanding development (Bonilla-Guachamín, 2020b).

Table 5.
Percentage of people using the internet, by area (2018 and 2019).

Área	2018	2019	Variación significativa 2018 y 2019
Nacional	55,9%	59,2%	Si
Urbana	64,4%	66,7%	Si
Rural	37,9%	42,9%	Si

Fuente: Encuesta Multipropósito (2018 y 2019).

Teachers and school principals receive permanent and adequate support from the public administration, as well as from other key stakeholders, such as platform and content providers, training in the pedagogical use of technologies, as well as support for the effective use of education management information systems, among others. Although fundamental, the introduction of digital technologies in the educational context requires much more than connectivity and devices(Ch et al., 2020).

After the distribution analysis in SPSS, a statistical inference analysis will be performed with the Pearson chi-squared test because most of the scientific variables are categorical. Percentages and frequencies will be taken into consideration for the detail of the results. A p-value <0.005 will be considered statistically significant.

Table 6
Cronbach's Alpha information

Dimension	***Cronbach's Alpha***	***Number of Questions***	***Interpretation***
Home	0,9256	1	ALTA
Job	0,9832		ALTA
Institution Educational	0,9334		ALTA
Centers of access	0,9845		ALTA
Questionnaire	**0,9567**		**ALTA**

Note: Analysis of the questionnaire behavior of the Cronbach's alpha items.

On the other hand, the behavior of each of the items of the questionnaire reveals alpha coefficients in all of them above 0.9567, which confirms the previous statement and allows us to conclude that each of the items of this questionnaire measures a portion of the trait we wish to study and, therefore, the instrument is reliable.

The suspension of face-to-face educational activity at all levels of education (among many other serious social and economic consequences) resulting from this pandemic has placed governments in a situation of manifest instability and uncertainty. The reopening of the educational system and its continuity through virtual environments has become a political and economic priority.

There is a complete correspondence between the theory and the results obtained in this research, of the 4 dimensions a high coincidence could be observed, based on the answers provided by the respondents.

Cronbach's Alpha index is very useful for measuring the internal consistency of reliability.

School education in the world will become increasingly technological, moving largely towards virtual environments. This will be uncharted territory (especially in primary and secondary education). Corrective and integrative measures will be necessary during the design and implementation of the next educational policies.

Conclusions

In Ecuador, as in other Latin American countries, although the prices of Internet connectivity are progressively decreasing, the prices of equipment (desktops, laptops, tablets, smartphones, smart TV) remain high compared to the cost of living in those countries.

This means that Internet connections via smartphones have grown at the same time that they have decreased for desktop computer use. This limits access to the Internet, resources/applications and uses that require a larger screen format that could facilitate multitasking (e.g., academic tasks). Likewise, other studies have shown that the lack of operational proficiency with the Internet can become an obstacle to the acquisition of information analysis and evaluation skills.

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