

MENDIVE



REVISTA DE EDUCACIÓN

Review article

Information and Communication Technologies in education during confinement by COVID-19

Las Tecnologías de la Información y las Comunicaciones en la educación durante el confinamiento por COVID-19

Tecnologias de Informação e Comunicação na educação durante o confinamento por COVID-19

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Received: December 9, 2022
Accepted: February 13, 2023

ABSTRACT

This descriptive bibliographic review addresses experiences of the benefits, risks, scope and limitations in the use of Information and Communication Technologies (ICT) during social isolation. The objective was to identify the most valuable guidelines for the proper use of Information and Communication Technologies from formal and informal education during confinement by COVID-19. The methods used were analytical-synthetic, inductive-deductive, adapted prism method, generalization-abstraction, hermeneutic and argumentative epistemic systematization. As a result, 90 bibliographic inputs were found, 70 articles from scientific databases, 20 from institutional portals; Therefore, it is verified that the adequate use of Information and Communication Technologies contributes to an optimal integral education.

Keywords: digital tools; Internet; challenges; society; teaching.

RESUMEN

La presente revisión bibliográfica descriptiva aborda vivencias de las bondades, riesgos, alcances y limitaciones en el uso de las Tecnologías de la Información y las Comunicaciones (TIC) durante el aislamiento social. El objetivo fue identificar las orientaciones más valiosas para el uso adecuado de las Tecnologías de la Información y las Comunicaciones desde la educación formal e informal durante el confinamiento por COVID-19. Los métodos

utilizados fueron analítico-sintético, inductivo-deductivo, método prisma adaptado, generalización-abstracción, hermenéutico y sistematización epistémica argumentativa. Se encontraron como resultado 90 insumos bibliográficos, 70 artículos de bases de datos científicas, 20 de portales institucionales; por lo que se comprueba que el uso adecuado de las Tecnologías de la Información y las Comunicaciones contribuye a una óptima educación integral.

Palabras clave: herramientas digitales; internet; desafíos; sociedad; enseñanza.

RESUMO

Esta revisão bibliográfica descritiva aborda experiências dos benefícios, riscos, abrangência e limitações no uso das Tecnologias de Informação e Comunicação (TIC) durante o isolamento social. O objetivo foi identificar as orientações mais valiosas para o uso adequado das Tecnologias de Informação e Comunicação da educação formal e informal durante o confinamento pela COVID-19. Os métodos utilizados foram analítico-sintético, indutivo-dedutivo, método do prisma adaptado, generalização-abstração, hermenêutica e sistematização epistêmica argumentativa. Como resultado, foram encontrados 90 insumos bibliográficos, 70 artigos de bases de dados científicas, 20 de portais institucionais; Portanto, verifica-se que o uso adequado das Tecnologias de Informação e Comunicação contribui para uma educação integral ideal.

Palavras-chave: ferramentas digitais; Internet; desafios; sociedade; ensino.

INTRODUCTION

The World Health Organization (WHO) pronounces on March 11, 2020 to announce that the disease caused by the new coronavirus SARS-CoV-2 has reached the category of pandemic, decreeing a long confinement with drastic distancing measures social, prohibition of agglomerations, among others. This long confinement led to a new normality, in which activities that were ordinarily face-to-face became virtual. The use of Information and Communication Technologies (ICT) made it possible to continue with professional, business, educational and social work (Thiel, Altmeier, Frahsa, Eschweiler, Nieß & Sudeck, 2021).

The Economic Commission for Latin America and the Caribbean (ECLAC) and the United Nations Cultural, Scientific and Educational Organization (UNESCO) confirmed that the long confinement to stop the spread of COVID-19 has led to the massive closure of educational institutions in 2020; More than 1,200 million students of all educational levels and modalities stopped receiving face-to-face classes worldwide (ECLAC and UNESCO, 2020).

In this context, the use of ICTs became widespread among children, adolescents, and young people, since in order to carry out their school activities virtually, parents provided their children with equipment, cell phones with an Internet line, exposing them to the risks of virtual spaces. (Schlosser, Maier, Jack, Hinrichs, Zachariae & Brockmann, 2021).

This new reality forced UNESCO to pronounce itself, qualifying the impact of ICTs on users as holistic, indicating that it influences their comprehensive training, state of health, entertainment options, hierarchy of values, among others (UNESCO, 2020). The United Nations Foundation for the

Education of Children and Children (UNICEF) also urged governments and industries in the sector to implement greater security functions in the devices, which help parents and teachers to teach how to use them safely. safe (UNICEF 2020).

This pandemic influenced the entire educational system, with vulnerable students being the most affected, which led to the implementation of educational policies, methodological and motivating strategies for personalized teaching, communication, and co-responsibility between family and school (Carreño-Moreno, 2021).

From formal education it can be affirmed that ICTs were implemented seeking educational continuity and, due to their great contribution, they will be part of this process, even after having overcome the confinement. The permanent incursion of ICT in digital classrooms generated the growing need to identify and implement new strategies for the development of educational activities, from digital literacy, guiding that it should be generic and specific in the different fields of knowledge, in which creative faculties are developed and strengthened such as: connection of simple and complex ideas, identification of similarities and differences, association and combination of data, fundamental capacities to effectively face challenges, problems, among others and that will result in progress and social well-being.

Likewise, it can be affirmed that the use of digital tools in the formal educational system generated important innovations in educational work, in which teachers and students developed increasingly contextualized digital skills to assume their roles, being one of the great strategies. , teach as you would like to be taught, thus generating your own style that leads to enriching diversity in the educational process. Likewise, the value of colorful and attractively designed educational materials

was highlighted as a transformative element in virtual learning.

The strategies to apply the evaluations were also substantially modified, having to be strictly virtual and to be relevant they had to be flexible and adapted to the reality of each student such as: ICT available at home, in flexible hours according to their possibilities of connectivity, taking into account the expectations and learning needs, the limitations and the learning environment at home, in a framework of permanent formative feedback, so as not to affect the levels of emotional health (Vega-Angulo, Rozo-García & Dávila- Gilede, 2021).

At the university level, shortcomings were found in the management of ICT, especially in older teachers, which required arduous training to fully assume the challenge of virtual remote work. However, it is recognized that the Internet is the technology with the greatest demand for educational purposes at this level of education; This shows that in this context, education must also continue to train critical and digitally active citizens (Díaz-García, Almerich, Suárez-Rodríguez & Orellana, 2020).

Likewise, it was found that university students who have greater development of self-efficacy and self-efficiency skills make better use of the Internet, which determines the applications of ICT in educational and professional training. It can be said with certainty that ICTs produce challenges and have a significant impact on Higher Education.

In Higher Education, WhatsApp has had various applications, including its use in communication skills; Their incorporation into the teaching-learning process has often been the result of the initiative of the teachers, together with the personal or group interests of the students (Martínez and Díaz,

2021). Similarly, WhatsApp has been considered an attractive resource for simultaneous communication among young people, which influences the dynamics of interpersonal and intragroup relationships as a virtual and communicative tool that also allows collaborative work between teachers (Monguillot, González & Guitert, 2017).

WhatsApp, from the affective point of view, reaffirms itself as an application that favors group cohesion and with other people, where not only academic content is shared, but others emerge from friendship, recreational and leisure interests (Suárez, 2018). This teaching-learning medium represents the materialization and management of the group and the collective, in environments different from traditional university spaces, facilitating communication between students and professors, and the definition of collaborative tasks, projects and sociocultural activities (Suárez, 2018; Noscué, Pauloni & González, 2019; Vilches & Reche, 2019).

The pandemic has also revealed the shortcomings of many teachers of different levels and educational modalities in their pedagogical and technological training, which was reflected in their performance in remote work. Since teachers do not have mastery of digital tools and teachers and students do not have technological resources in their homes, the WhatsApp application was transformed from a means of instant communication to a virtual support space in the teaching-learning process (Zambrano, 2020). The use of educational platforms was also maintained and increased, for the interaction of teachers, students and parents.

In the same way, the high professional level and selfless work of many other teachers who offered their digital skills, their communication potential and access to information, for the exercise of remote work on time, is recognized, which is why this

confinement also affected their physical and emotional health, presenting symptoms of stress, anxiety, depression, muscle pain, visual problems, etc., data that is a call to the higher bodies of the educational systems to generate policies that contribute to the health care of teachers, which will also contribute to the emotional well-being of the students and guarantee the quality of the teaching-learning processes (Ozamiz-Etxebarria, Dosil, Idoiaga & Berasategi, 2021).

It can also be recognized that the appointed teachers showed better resilience and leadership management in these pandemic contexts, because they have a better knowledge of the reality where they work and because of their economic stability. However, the hours dedicated to virtual teaching were much more than those legally established; that is, they worked without schedules, being available at all times, which made it difficult to reconcile work activity with family life, times and spaces for rest and recreation. This continuous and excessive connection to the Internet invited us to reflect on the need to establish strategies and create mandatory spaces for digital disconnection for a healthy use of it.

This peculiar educational scenario has shown once again that the role of the teacher is fundamental and that it cannot be replaced by technology, since teachers not only transmit knowledge but also provide affective and emotional support to students (Baladrón, Correyero & Manchado, 2020).

However, it can be affirmed that teacher-student interaction, through listening and speaking, replaces presence and corporality; Likewise, this educational digitization has required teachers to train to develop skills in the use of various digital tools and platforms, achieving the exercise of teaching more and more contextualized.

From informal education, it was also sought to contribute to the responsible use of ICT, for which reason health specialists recommended being attentive to behaviors that children and adolescents present at home and that they set off alarms to resort to the competent professional; as in the cases of video game disorders that should receive clinical treatment, if possible, or empirical, based on dialogue, empathy, promotion of skills and responsibilities, promotion of feelings of self-efficacy and offering healthy fun options (Huertas- April, 2021).

Similarly, the offer of active video games was promoted to increase physical activity in lovers of this type of entertainment, seeking to control stress, anxiety and obesity.

The contents of the educational resources that are presented, according to Guardado, (2021) must be precise, current, valid, representative, coherent, interactive, integrated, standardized, significant, attractive and enriched by a variety of formats. In addition to this, learning is better when emotional components are incorporated into the content. Along the same lines, Mora (2013) affirms that through emotion it is possible to "generate empathy, be it with gestures, the intonation of words, the construction of sentences and their content or the ease of approaching and make the listener understand those contents" (p. 176).

In addition, according to Gómez and García (2021), consensus perceptions are revealed that show that emotional competencies are resources that need to be strengthened in the university setting; so that students are trained as professionals capable of offering groups and communities the relevant help to face crisis situations and are people with the necessary skills to face adverse situations such as COVID-19.

The educational, motivating and controlling role of the family was also promoted to guarantee the proper use of the digital tools available at home; Regarding the treatment that adults should give to children and adolescents at home, fluid and assertive communication was recommended with permanent displays of affection, dedication of time and quality spaces to interact as a family, as well as permanent displays of care towards them. They are important protective factors to avoid the compulsive and addictive use of ICTs during confinement, as well as to avoid any other risky behavior (Ceberio & Calligaro, 2020).

The use of social networks did not show a negative impact; however, parents and teachers did not let their guard down. This pandemic has ratified that the proper use of the computer, with an internet line, favors academic performance in all curricular areas. Dialogue and ICT are instruments that expand learning possibilities; However, just as the responsible use of ICT responded positively to this context, excessive use with little contact with people and the environment, predisposed to a difficult management of emotional capacities, causing stress, depression, anxiety, among others, showing in real life the negative consequences of inappropriate use of ICT.

In the classification of emotions, their functional nature is recognized, since they play a significant role in behavior, in the relationships between the person and their internal or external environment, presenting different levels of expression that depend on the degree of involvement of the personality, the significance of the situations and needs experienced by the subject. So, a vision of human nature that does not contemplate its emotional content would be incomplete; For this reason, it is necessary to learn to recognize the wide range of emotions that are experienced, interpret them, self-regulate them and reflect on their usefulness in managing the intrapersonal and

interpersonal world Gómez and García (2023).

At this juncture, ICTs have been more present than ever, which is why they have had to reinvent themselves in a context that also allowed ICTs to be valued as extraordinary tools for innovation in the educational, work, social and personal fields, strengths that will continue being implemented even after having overcome this pandemic. As part of the contribution to the implementation of the strengths for the proper use of ICT in children and young people in society in general, the objective of this research was formulated: to identify the most valuable guidelines for the proper use of ICTs. ICT from formal and informal education during confinement by COVID-19.

DEVELOPMENT

Methodology used

For the gestation of this research work, literature from scientific databases and institutional pages regarding the subject was reviewed, information was sought with the following terms: "education" and "COVID-19", "education" and "pandemic", "virtual education" and "pandemic". It was considered that the parameters for the choice of bibliographic inputs should be free access; between the years 2019-2021 with some exceptions; subject area: Education and Psychology. Those that did not contribute to the study variables and that did not comply with the established parameters were discarded, as detailed in Figure 1.

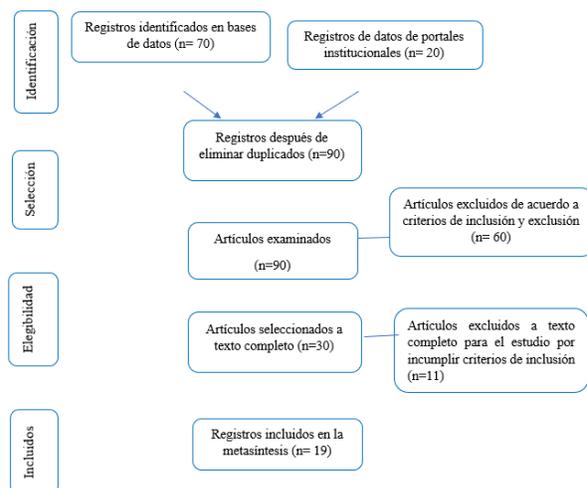


Fig. 1- Adaptation of PRISMA Flow Diagram

The stages involved in the elaboration were: definition of the review objectives, conducting a bibliographic search (establishment of a search strategy, for the adequate consultation of the databases and documented sources), specification of the document selection criteria, organization of information and writing of the article.

For the collection and analysis of information, the following methods were used: analytical-synthetic, inductive-deductive, generalization-abstraction, as well as an adaptation of the Prisma method, which allowed the systematization of established knowledge. To interpret and understand reality in its various manifestations, the hermeneutic method was used until it resulted in a reflection in the educational field and for the development of the text two nuclei were taken into account: the first, which explains the epistemic mapping in the logic of investigative process and the concretion of the epistemic-referential dimension in the processes of scientific-textual construction, likewise the argumentative epistemic systematization is positioned as a transversal method in a general sense (Deroncele, Gross & Medina, 2021).

It is considered that university education must contain spaces for strategic analysis; synthesis of knowledge, skills, values and attitudes within the framework of historical-social relevance, and the ability to organize tasks and deal with unforeseen situations, in order to formulate projects that enable the articulation of science and research to technological change in the industrial and service sectors (Lazo Fernández, Márquez Marrero & García González, 2023).

This type of research allows us to photograph the face of reality and the real problems that exist, as well as help to identify the main aspects that affect the disarticulation of relationships between actors, the little follow-up and evaluation of the results, and in poor socialization and the few technological offers that universities offer to the productive sector, among other aspects (Triana Velázquez, Díaz Pérez, García González and Ferragut Reinoso, 2021).

In this context, the challenge must be focused on collaboration, cooperation, integration, linking and continuous training among all social actors, based on the perspective of knowledge management, innovation and technologies.

Results obtained

19 bibliographic inputs were found for the preparation of this bibliographic review article. Detailing we have: two from the SCOPUS database, five from SciELO, eight institutional portals, one from Dialnet, two from Redalyc, one from EBSCO.

Table 1- Bibliographic sources related to the research topic

No	Author/ year / title	database	Country
1	Baladrón Pazos, AJ, Correyero Ruiz, B. & Manchado Pérez, B. (2020). Digital transformation of university teaching in communication during the COVID-19 emergency in Spain : An approach from students' perspective.	dialnet	Spain
2	Carreño -Moreno, SP (2021). COVID-19, teaching, and service: the challenge of nursing training practices.	SciELO	Colombia
3	Ceberio , MR & Calligaro , C. (2020). "Instructions" to children and adolescents on the COVID-19 pandemic, content and forms of communication.	ebsco	Argentina
4	ECLAC. (2020). Digitization in Latin America in the face of COVID-19.	ECLAC Institutional Portal	Global vision of Latin America
5	ECLAC and UNESCO. (2020). Education in times of pandemic (COVID-19).	ECLAC Institutional Portal	Global vision of Latin America
6	Deroncele Acosta, A., Gross Tur, R., Medina Zuta, P. (2021). Epistemic mapping: an essential tool in research practice.	SciELO	A global vision
7	Díaz-García, I., Almerich Ceveró , G., Suárez-Rodríguez, J. and Orellana Alonso, N. (2020). The relationship between ICT competencies, ICT use and learning approaches in university students of education.	Scopus	Spain
8	Estrada-Lorenzo, JM, Medino -Muñoz, J.,	redalyc	A global vision

	Rebollo-Rodríguez, MJ, Campos-Asensio, C. and Primo-Peña, E. (2021). consequences of production COVID-19 scientist .		
9	Huertas-April, CA (2021). Developing Speaking with 21st Century Digital Tools in the English as a Foreign Language Classroom: New Literacies and Oral Skills in Primary Education.	Scopus	Spain
10	World Health Organization (2020). Opening remarks by the Director General of the WHO at the press conference on COVID-19 held on March 11, 2020.	WHO Institutional Portal	A global vision
eleven	Ozamiz-Etxebarria, N., Dosil Santamaría, M., Idoiaga Mondragon, N. and Berasategi Santxo, N. (2021). Emotional state of the teaching staff of colleges and universities in the north of Spain before COVID-19.	SciELO	Spain
12	Penafiel Chang, LE (2021). Economic, political and health panorama of Latin America and the Caribbean at the beginning of the COVID-19 pandemic.	SciELO	A global vision
13	Schlosser, F., Maier, B., Jack, O., Hinrichs, D., Zachariae, A. & Brockmann, D. (2021). COVID-19 lockdown induces disease-mitigating structural changes in mobility networks.	Institutional portal PNAS	Germany
14	Thiel, A. Altmeier, D., Frahsa, A., Eschweiler, GW, Nieß, A. & Sudeck, G.	EURAPA Institutional Portal	A global vision

	(2021). Saving lives through life-threatening measures? The COVID-19 paradox of infection prevention in long-term care facilities.		
fifteen	Unesco. (2020). The impact of ICT on girls, boys and adolescents.	UNESCO institutional portal	A global vision
16	UNICEF. (2020a). Children are at increased risk of harm online during the global COVID-19 pandemic.	UNICEF institutional portal	A global vision
17	International Telecommunication Union. (2010). World Telecommunication/ ICT Development Report 2010.	ITU institutional portal	A global vision
18	Vega-Angulo, HE, Rozo-García, H. and Dávila-Gilede, J. (2021). Assessment strategies mediated by Information and Communication Technologies (ICT): a literature review.	redalyc	A global vision
19	Zambrano Vacacela, LL (2020). Use of Information and Communication Technology in virtual education and its correlation with the Emotional Intelligence of teachers in Ecuador in the context of COVID-19.	SciELO	Ecuador

Discussion of the results

Benefits and risks of the use of ICT during confinement by COVID-19

It can be affirmed that the use of ICTs has changed the behavior of man: creating information, searching for it and obtaining it are now inherent to human nature; Likewise, the permanent evolution of digital tools makes these activities increasingly easier,

fun and entertaining experiences, which is why the number of users is increasing every day.

Thanks to ICT, the social distancing required by COVID-19 did not prevent social interaction, educational work, among others. In this context, ICTs were an essential element of communication, transmission of knowledge and social relations; however, it is important to differentiate between use skills for search, selection, information processing and to relate assertively.

However, the intensive use of social networks and the Internet in a context of social isolation, predisposed to stress, depression, anxiety, physical weakness, weight gain, joint and muscle pain, among others. The severity of these pictures was related to the frequency and intensity of use, genetic predisposition, physical and emotional state of health, the psychological impact of this confinement was moderate to severe; however, there was less impact in populations with high human development (Peñafiel Chang, 2021).

Likewise, this long confinement favored dependence on technology and digital solutions; but not all of them proved to be able to use ICTs in a profitable and safe way, predisposing themselves to compulsive, addictive, criminal behaviors or victims of cyberbullying and, in the worst case, grooming, sexting, pornography and other forms of exploitation, with the promise of false job offers, trips or payments, high-risk situations in vulnerable populations (UNICEF, 2020).

For the International Telecommunications Union (ITU, 2010), ICTs are deeply embedded in the social interactions of daily life, so there is no other alternative than to strengthen educational processes in which the necessary digital skills are developed to allow the use of effectively and efficiently the

available technological devices and resources, not only for personal benefit but also for knowledge and participation in solving social and environmental problems, etc. This global digital revolution, together with the multiple challenges of today's society, envisions a future full of challenges to face in the search to achieve the much-needed competent digital citizenship.

Scope and limitations of the use of ICT during confinement by COVID-19 and its approach from formal and informal education

Digital transformation is recognized as a scope of this pandemic in many fields, the identification of the digital divide, in others, and due to the demands of the context, the application of policies to reduce it, although the implementation of ICT and the skills for its optimal use in many environments continues to be a great need, since they still do not respond to the profile of the different types of users. In this context, it is complex to conceptualize terms such as: freedom, privacy, citizen participation, digital globalization in the disconnected, the scope of the impact of the exercise of digital citizenship, among others.

Effective and efficient virtual education is possible through the use of different educational platforms, as well as the adaptation of pedagogical inputs to be worked through virtuality, in which teachers and students interact fluently. However, these virtual platforms still do not respond to the wide range of needs and expectations; however, there are other difficulties such as: lack of connectivity (lack of access to equipment and Internet connection); precarious digital skills on the part of teachers and students with less access to digital tools. In other cases, lack of discipline for responsible autonomous use. Evident problem even in more advanced countries (ECLAC, 2020).

We can consider the scientific production on SARS-CoV-2 to be a great scope for the use of ICTs for educational purposes, with more than 66 thousand articles related to this topic being produced (Estrada-Lorenzo, Medino-Muñoz, Rebollo-Rodríguez, Campos -Asensio & Primo-Peña, 2021); however, it still remains a great challenge to neutralize the virus and its form variants. This pandemic must leave as teaching to focus on researching and communicating about epidemics and possible pandemics, seeking to prevent this scourge of humanity from repeating itself.

CONCLUSIONS

After reviewing, analyzing and reflecting on the selected bibliography, it is concluded that the responsible use of ICT during the confinement by COVID-19 was difficult to exercise; It is a challenge for which you will never be sufficiently prepared, since ICTs are constantly evolving. Likewise, the proper use of digital tools is a great contribution to the integral development of humanity and inappropriate use exposes us to risks.

Educating for the proper use of ICT is a task that must be addressed from formal and informal education, to which everyone must contribute from the role they play in society, seeking to promote social inclusion, so that no one is excluded. to be a true digital citizen.

From formal distance education, he was educated in the proper use of ICT through interaction on educational platforms that allowed access to virtual classrooms, facilitating the interaction of students and teachers, with access to educational and teaching materials- learning, in text and/or audiovisual format.

From informal education, during confinement, the safe use of ICTs was taught by: promoting an environment of trust and

empathy at home; avoiding an inflexible attitude towards the use of screens; teaching to be critical and to know better the Internet resources; being an example of proper use; generating balance between the time of ICT use, academic work, home responsibilities and free recreation; encouraging appropriate behaviors when connected *online*; digital publications with a positive and formative approach; exercise of duties and respect for rights in the role of digital citizen.

It can be said that we have an optimal development in the skills for the proper use of ICT when mastery is demonstrated in: learning to handle large volumes of information, interacting in a multi-channel way, protecting privacy rights, addressing new addiction problems, anticipating new types of social exclusion taking care of public identity, changing the way we study and work, but also the way we play and have fun, adapting to the constant cycle of the evolutionary process: new challenges, new skills.

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Conflict of interests:

The authors declare not to have any interest conflicts.

Contribution of the authors:

The authors participated in the design and writing of the work, and analysis of the documents.

Quote as

Tarrillo-Marín, M., Fernández Otoya, FA, Moreno Muro, JP & García González, M. (2023). Information and Communication Technologies in education during confinement by COVID-19. *Mendive. Revista de Educación*, 21(3), e3304.
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