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Technologies applied in the teaching-learning process during COVID-19: An analysis in Basic Education

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ABSTRACT

The objective was to analyze the technological tools applied in the teaching-learning process of Basic General Education during the COVID-19 pandemic period, in educational institutions of the C04-05 circuit belonging to Guacaleo Canton, located in the province of Azuay-Ecuador. For this, a study with a quantitative methodological approach based on positivism and with a non-experimental design was developed. The results show the teachers' predisposition to change when developing the didactic and learning process by accessing video calling platforms and using social networks to send and receive school activities, especially, with students who lack a fixed internet. They also see the students' lack of technological resources as an impediment, since this could be violating the rights of children to receive a quality education in these times of pandemic due to the COVID-19 disease.

Descriptors: Information technology; computer uses in education; computer assisted instruction; electronic learning. (Words taken from the UNESCO Thesaurus).

INTRODUCTION

Education, as stated in the Constitution of the Republic of Ecuador (2008) in its articles 26 and 27, is a duty of the State to guarantee not only the right to education, through public policies and state investment, but also equality and social inclusion for Sumak Kawsayo's good living. In the same way, the (Ministry of Education of Ecuador, 2020) has promoted the COVID-19 Educational Plan, to cope with the continuity of the distance educational process, pretending that, in this modality, there is equality in accessibility to education. Likewise, in consideration of the National Curriculum of Ecuador and even more in the face of the health crisis caused by the COVID-19 disease, both globally and nationally, it is necessary to consider Information and Communication Technologies [ICT] as a regular part of the educational process (Quevedo-Álava, et al., 2020).

In this sense, in recent years with the incorporation of ICTs in education in connection with globalization processes, people have been insistently questioned about the

necessary learning and cultural knowledge to constitute the frame of reference and develop an education with quality in educational centers. Hence, it is important to address the implementation of Information and Communication Technologies in educational centers of Basic General Education, as a strategy to deploy the teaching-learning process, strengthen teaching staff and improve student learning in these times of pandemic due to the COVID-19 disease (García-Cedeño, et al., 2020).

Given the above, it is relevant to consider: first, the motivation for learning, which is what leads the student to learn; and, second, as (Echeverry-Arcila, et al., 2017) show, the apprehension, in order to 'learn to communicate'; in this way, the students will understand the opinions of others with respect, giving the same importance to each contribution to later help them improve their learning needs. Then it may be affirmed that the implementation of active, motivating and flexible methodological strategies such as collaborative work [CT] mediated by ICT, favors the development of learning and allows learners and the educator to improve educational processes.

Thus, in this scenario of the closure of educational institutions, caused by the pandemic of the COVID-19 disease, and that has impacted on education forcing teachers to use and implement ICT in the teaching-learning process; this is presented as one of the most versatile alternatives within distance education. The implementation of ICT allows the learner to be a participant in the activities proposed by the educational centers according to their needs. However, it has also revealed the inequality of opportunities due to the fact that not all apprentices have adequate technological resources (Vélez-Loor, et al., 2020).

In this same context, it is also important to highlight the educator’s role that must be consistent with educational quality. In this sense, (Rodríguez-Torres & Sánchez-Antolín, 2016) express that with the adaptation and implementation of technologies in various digital devices in public educational centers, didactic quality have improved and taken advantage of greater opportunities in the development of the educational process; for

this reason, teacher training in technology has been promoted. In this respect, (Argandoña-Mendoza, et al., 2020) say that the educators must be prepared in active and motivational strategies; likewise, they must get knowledge about technology both in its use and in its application.

Educator training

Currently, educational centers face changes and face new visions in which the teachers are forced to maintain a constant update, the same that allows them to face the emerging processes of the Educational System, taking advantage of its potential to improve and optimize their teaching performance both in person and virtually in these circumstances of a pandemic due to the COVID-19 disease.

In this context, teachers play a central role in achieving the implementation of ICT, who must have competencies and positive attitudes towards change and transformation for the improvement of educational practices. In this way, (Valdés-Cuervo, et al., 2011) reveal that the correct incorporation and integration of ICT in Basic Education is a necessity in the Educational System; therefore, it is necessary for the teacher to be prepared in this matter, since their basic training is directly related to the educational discipline they teach.

In the same way, (Almerich-Cerveró, et al., 2011) state that the competencies and the use of ICT are related to the dimensional structure of the educator at the time of teaching their classes, which means that the digital skills of the teacher and the use of ICT are made evident in the way of deploying the didactic act.

Likewise, (Lores-Gómez, et al., 2019) affirm that teacher training is important for the integration of ICT in Primary Education. Also, they evidence that the initial and continuous training of teachers in reference to ICT in educational centers is fundamental, since they must have digital skills in order to know how to design materials with innovative and active didactic applications that significantly improve the student learning.

The foregoing and the hasty introduction of ICT in educational centers due to the COVID-19 pandemic, highlights the need to prepare teachers to respond, theoretically and instrumentally, not only to the needs and demands that entail a quality education; but also in the face of large relevant situations, such as the current one generated by such a health crisis.

METHOD

The study was developed from a quantitative methodological perspective based on the positivist paradigm. In this sense, the research design was characterized by being non-experimental field, transactional, since the information was collected directly from reality, in a single moment and without deliberative manipulation of the study variables. Likewise, the research was developed at a correlational level with a sample of 52 teachers from public institutions in both the urban and rural sectors.

Results

With the results obtained, it can be stated that due to the temporary closure of the institutions because of the COVID-19 pandemic, changes have occurred in educational environments; since teachers have seen the need to apply ICT in the teaching-learning process. In this scenario, it is evident that the teachers although they have the basic knowledge for the implementation of ICT in the educational process, do not have the necessary skills to use appropriate applications to look after all students. In addition, not all students have fixed internet services for their learning.

The following graph expresses the information on the percentage of teachers who believe that the implementation of ICT is essential in the teaching-learning process in the face of the health crisis of COVID-19. Therefore, the variable studied is the implementation of ICT.

Teachers were asked if they consider necessary to implement ICT in the Teaching-Learning process during the health crisis generated by COVID-19. In this sense, 84.62% of them stated that it is always necessary and 9.62 said that the implementation of technology tools is almost always essential, especially considering that institutions have been closed, both at the national level as worldwide due to the pandemic. Also, 5.77% of teachers indicated that the use of ICT is sometimes essential.

With these results, it may be inferred that 94.24% of the teachers surveyed recognized and expressed the importance of the implementation of ICT in the educational process, especially, in these times of the Covid-19 pandemic. It is also worth mentioning that they have considered the suggestions of the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2020) in its struggle to lessen the impact of the closure of educational centers, which is why the teachers saw the need to rely on ICT for continuing their work remotely. In addition, the teachers indicated that they have technological resources which facilitate communication with students.

Types of social networks

Regarding the question about social networks that allow them to communicate with students effectively, they indicated that they use applications such as: WhatsApp with 100% and Facebook (Messenger) with 61.54%, as they have allowed the sending and receiving of activities proposed to work weekly.

These data showed that teachers in the face of the COVID-19 pandemic have established communication with their students, allowing them to continue with the educational process. In addition, it showed the influence of ICTs in education, as well as the most common technological applications used by teachers during the health crisis. In this sense, technologies have gained strength in the educational field both nationally and globally.

ICT in the teaching-learning process

65.3% of the surveyed students stated that, with the use of ICT, they have always or almost always been motivated towards learning and thereby they have improved their academic performance. This result was corroborated with Pearson's Chi-square test, when it was observed that the asymptotic (bilateral) significance was 0.006, being less than 0.05, showing that the affirmative hypothesis (H1) was positive and the variables significantly correlated.

With this information, it was shown that technological tools have motivated and helped students to improve their learning. Likewise, it has been considered that students were digital innate according to their age.

Use of platforms and / or applications during the COVID-19 pandemic

In the face of the COVID-19, the in-person education is affected, forcing educators to seek alternatives in the educational process. That is why teachers were consulted about the use of the platform to teach their online classes; in this respect, the most commonly tool used was the platform called zoom with 90.38%, besides, the video-calling and virtual meeting software accessible from desktop computers, laptops, mobiles and tablets. It must be taken into account that teachers have had limited access by using a free account, which gives them 40 minutes to interact.

Another of the programs used to teach their classes was Messenger with 28.85%, in addition, Microsoft Teams with 26.92%, the latter was the proposal issued by the Ministry of Education of Ecuador to implement in the Educational System, since that allows teachers to create collaborative classrooms, connect with video calls with unlimited time and work with Office 365 that includes Microsoft Teams, being free for the entire educational community. The initiative of this platform is to allow teachers to implement the pedagogical files found on the MINEDUC website, in order to continue

with their activities through the “My Online Classroom” project.

This information, which revealed whether teachers were using online platforms to teach their classes also evidence if students have had continuous access to the internet. In this sense, 57.7% of the students stated that they ‘sometimes’ had access to the internet, demonstrating that not all students have received their classes online during the pandemic. In turn, this analysis suggests a pedagogical proposal that activates ICT measures with tools and accesses available to the student.

Types of application that are used by teachers to teach their classes.

The teachers were consulted regarding the applications they have used to present information or activities to their students during the Covid-19 pandemic period. In this sense, the result showed that 78.85% of teachers used Microsoft Office applications such as Word and PowerPoint and 34.62% used Google forms. These types of applications allowed the teacher to prepare questionnaires for their students.

These results demonstrated the insufficient levels of knowledge that the teachers had with reference to the use of technological applications with an educational sense in teaching practice. Well, it has also been observed that they only used part of the office software package provided by Microsoft, since in spite of these programs facilitate the automatization and perfection of the usual activities in an office, they are not in accordance with the needs and demands of the teaching-learning process.

To show that this is not an exclusive reality of Ecuador, it is important to bring up (Brítez, 2020) when he argues that education in the face of the advance of COVID-19 in Paraguay has resorted to virtual classes as a way for avoiding losing the school year, enabling digital platforms and using different technologies such as: WhatsApp, videoconferences, sending files, classroom, among others; although not all teachers are prepared for the correct use of educational technologies.

Despite this, there is evidence of a propensity for change when developing the didactic and learning process, accessing video calling platforms and using social networks to send and receive school activities, especially, with students who lack internet permanently. However, the students' lack of technological resources has been an impediment and has been a violation of the boys' and girls' rights to receive a quality education in these times of pandemic due to the COVID-19 disease, since it proves that the country is not prepared for this kind of emergency.

PROPOSAL

Considering the results obtained in the research and to cope with the teaching-learning process between students and teachers in these times of pandemic, a proposal is presented to implement ICT in the didactic process, considering the WhatsApp service as the most commonly social network used for the deployment of such process.

For improving the learning of Basic General Education students in these circumstances, the use of WhatsApp is assumed because with it a synchronous, active and continuous communication is maintained with all students to carry out the proposed activities.

Proposal for the WhatsApp App implementation in the teaching-learning process in times of COVID-19 pandemic. Source: Own elaboration (2020).

It is important to know that WhatsApp will allow teachers to communicate with the students in real time.

Authorization and Commitments. Considering that the students are minor and that they do not have the minimum age suggested for the use of WhatsApp (13 years old), the authorization of the father, mother and / or legal representative must be requested, so that the student may use this App. By having the consent, commitments must be established with the legal representatives, who must be vigilant of the correct use and

operation of the application.

Identity- Group. Creating a group in this App will allow better student learning in times of health crisis not only because the majority of them use this application but also because many of the mobile operators offer promotions to be able to enter easily and at low costs for a whole month.

In reference to identity, a name will be assigned to the educational group according to the proposed activities. The teachers who intervene in the year of Basic General Education and the students will be part of the group, who will be identified with the name and surname. Likewise, the legal representatives will have the responsibility to have their children in this group for educational purposes only. The teacher tutor will be the group administrator and moderator of the information.

Standards - Objective. Standards for correct use will be established including:

a. Respect each of the group members
b. Do not turn the group into an agenda
c. Verify the information to share
d. Only share content according to the silver activities
e. The student must have some freedom to learn to use the group correctly.
f. Maintain order and organization
g. The teacher will delete the content not relevant to the topic
h. Respect the established hours (7:00 am - 2:00 pm)

The objectives to create the group must be clear and directed in the activities to improve the educational process; children must be protagonists in the exchange of material, photos, images and content.

Identification of the Apps. It should be known that WhatsApp has tools that will allow people to communicate in real time, benefiting the educational purposes that we suggest in this proposal. It must be clear about the functions provided by this application, so the environment will be known to properly manipulate:

a. Consider that this App will allow you to send and receive messages through the internet.

b. You can share and receive images, videos, audios, audio recordings, documents, links to enter other applications or pages on the web, so you can also share locations, contacts, gifs.

c. Calls and video calls with several participants at the same time will be available.

Messaging. Take into account the following parameters:

a. Instant messaging or communication between peers or several members of the group in real time.

b. Read the message well before sending, watch the spelling.

c. Use it correctly and when necessary.

d. Share information that is relevant, meaningful and necessary.

Sending and receiving activities. Consider the following:

a. The activities must be short, clear and concise, they must take into account the activities worked or proposed.

b. Homework should be in accordance with the ability and level of students' knowledge.

c. The activity must fulfill a purpose of review and interests of the student.

d. The activities must be reviewed, commented and fed back between the teacher and student, and then graded.

e. For the execution and sending of activities, the hours of the working day will be taken into account.

f. A schedule will be established for the delivery of activities according to the subject, determining one day a week.

Didactic Resources. Regarding images - videos and files.

a. You must take care of the content of the images that you send both as a teacher and as the student.

b. Make videos with a clear intention, they should be short and focus on educational purposes.

c. They can be shared from other platforms such as YouTube.

d. The videos must be downloaded and later sent for the student's ease by only having the plan to use WhatsApp.

e. Videos must impact, motivate and interest students.

f. It is possible to send files of any type (Word, Excel, PowerPoint, etc. but it is recommended to send large files in PDF extension.

Calls-Video calls. Use according to need:

a. Calls and video calls are free.

b. Video calls may be made in small groups.

c. They will be used to provide tutoring and feedback.

d. A schedule should be established to avoid call saturation.

Evaluation. It will allow knowing if the App is adequate, pertinent to continue and improve the teaching-learning process with students of Basic General Education in times of coronavirus COVID-19.

In addition, if students have permanent internet, they may prepare structured questionnaires in various applications on the web such as Khoot, a tool that allows you to create contests on the topics learned to reinforce the student in their teaching-learning process.

CONCLUSIONS

In this scenario of a pandemic due to the COVID-19 disease, virtual education has become habitual with digital platforms that have been established. Teachers have made use of some technological resources, available in their environment and based on their knowledge. However, it has not been possible to maintain adequate communication during the pandemic, since it is evident that many students do not have the technological resources and the necessary fixed internet. Consequently, communication between teacher-student is difficult, which possibly affects the development of the learning process during this health crisis.

With regard to social networks, it is worth saying that these have become very common in these times of health crisis. Therefore, they should be used by giving them the appropriate and correct use, so that the students may continue with their learning and also overcome their goals.

Although teachers implement ICT in the educational process, it is evident that in terms of digital applications, there is a lack of knowledge and skills for it. Therefore, a training plan for the teacher is needed around ICT as a strategic educational resource because this will contribute to the improvement of the teaching-learning process and, therefore, to a quality education. In this way, the teachers will be able to implement didactic resources mediated by them in order to generate significant learning processes according to the needs of the student in daily living.

REFERENCES

Almerich-Cerveró, G., Suárez-Rodríguez, J., Jornet-Meliá, J., & Orellana-Alonso, M. N. (2011). Competencies and the Use of Information and Communication Technologies (ICT) by the Teaching Staff: Dimensional Structure *Revista Electronic Journal for Educational Research, 13*(1), 28-42.

Argandoña-Mendoza, M., García-Mejía, R., Ayón-Parrales, E., & Zambrano-Zambrano, Y. (2020). Educational research and innovation: School challenge for COVID-19 in Ecuador. *EPISTEME KOINONIA, 3*(5), 162-182. http://dx.doi.org/10.35381/e.k.v3i5.726

Audiffred-Hinojosa, A. (2019). WhatsApp for Education. Available from https://n9.cl/63hg

Bonilla-Guachamín, J. A. (2020). The two sides of education in covid-19. *CienciAmérica*, 1-10. http://dx.doi.org/10.33210/ca.v9i2.294

Boude-Figueredo, Ó., & Sarmiento, J. A. (2016). Tools web 2.0: Impact on learning of Colombian youths. *Option, 32*(11), 143-163.

Brítez, M. (2020). Education before the advance of COVID-19 in Paraguay. Comparative with countries of the Triple Frontier. Preprint / Version 2. https://doi.org/10.1590/SciELOPreprints.22

Cacheiro-González, M. L. (2011). ICT educational resources for information, collaboration and learning. *Pixel-Bit. Media and Education Journal,* (39); 69-81.

Castro, S., Guzmán, B., & Casado, D. (2007). ICT in the teaching and learning processes. *13*(23); 213-234.

Constitution of the Republic of Ecuador. (2008). Constitution of the Republic of Ecuador. Available from https://n9.cl/hd0q

Echeverry-Arcila, C. P., Quintero-Vergara, H., & Gutiérrez-Giraldo, M. C. (2017). Collaborative pedagogical strategies in practices. *Latin American Journal of Educational Studies, 13*(1), 83-104.

García-Cedeño, G., Vélez-Loor, M., Franco-Zambrano, C., & Ormaza-Bermello, M. (2020). Competency based Learning: A Curricular Rearrangement during School Emergency by COVID-19. *EPISTEME KOINONIA, 3*(5), 221-235. http://dx.doi.org/10.35381/e.k.v3i5.770

González-Vargas, J. E. (2014). A look at collaborative work in primary school from social representations. *Ra Ximhai, 10*(5), 115-134.

Islas-Torres, C., & Carranza-Alcántara, M. (2011). Use of social networks as learning strategies. Educational transformation?. Opening, *3*(2), 1-20.

Lores-Gómez, B., Sánchez-Thevenet , P., & García-Bellido, M. R. (2019). Digital Competency preparation in teachers. *Journal of Curriculum and Teacher Training, 24*(4), 234-260.

Maenza, R., & Sgreccia, N. (2011). Use of web 2.0 tools with future teachers of Mathematics. *Faculty, 15*(3), 280-295.

Ministry of Education of Ecuador. (2020). Covid-19 Educational Plan was presented on March 16. Available from: https://n9.cl/3w6t

Palella, S. & Martins F. (2015). Methodology of quantitative research. Venezuela. FEDEUPEL

Pérez-de-A., M., & Telleria, M. (2012). ICT in education: new learning environments for educational interaction. *Journal of Theory and Didactics of Social Sciences,* (18); 83-112.

Pérez-Alcalá, M. D., Ortiz-Ortiz, M. G., & Flores-Briseño, M. M. (2015). Social networks in Education and methodological proposals for their study. *Science, Teaching and Technology, 26*(50); 188-206.

Quevedo-Álava, R., Corrales-Moreno, L., Palma-Delgado, G., & Mendoza-Suárez, G. (2020). Psychopedagogy and ICT in the COVID-19 period. A Reflection for Meaningful Learning. *EPISTEME KOINONIA, 3*(5), 202-220. http://dx.doi.org/10.35381/e.k.v3i5.769

Rodríguez-Torres, J., & Sánchez-Antolín, P. (2016). Inclusion of ICT in the Public School: Realities and Prospects. Actions «Escuela 2.0» y «Conectar Igualdad» *Option, 32*(8), 641-655.

Saltos-Cedeño, A., Vallejo-Valdivieso, P., & Moya-Martínez, M. (2020). Innovation in higher basic mathematics education during confinement by COVID-19. *EPISTEME KOINONIA, 3*(5), 142-161. http://dx.doi.org/10.35381/e.k.v3i5.723

Soto-Ortíz, J. L., & Torres-Gastelú, C. A. (2016). The perception of collaborative work through the didactic support of tools. *Opening, 8*(1), 1-12.

United Nations Educational, Scientific and Cultural Organization (UNESCO, 2020). UNESCO's support: educational response to COVID-19. Available from https://n9.cl/6rxp

United Nations Educational, Scientific and Cultural Organization. (UNESCO, 2019). ICT in education. Available from https://n9.cl/0dWQ

Valdés-Cuervo, A. A., Arreola-Olivarría, C. G., Angulo-Armenta, J., CarlosMartínez, E. A., & García-López, R. I. (2011). Basic education teacher's attitudes towards ICT. *Magis. International Journal of Research in Education, 3*(6), 379-392.

Vélez-Loor, M., Vallejo-Valdivieso, P., & Moya-Martínez, M. (2020). Virtual teaching resources in natural science projects during confinement period by COVID-19. *EPISTEME KOINONIA, 3*(5), 183-201. http://dx.doi.org/10.35381/e.k.v3i5.760