



USE OF TECHNOLOGY IN THE QUALITY OF EDUCATION IN TIMES OF PANDEMICS

FREDDY OCHOA-TATAJE¹, JEIDY PANDURO-RAMIREZ², LUIS VELARDE-VELA³,
MARIA ALZA-SALVATIERRA⁴, JUAN PAUCAR-ELERA⁵, YOHNNY HUARAC QUISPÉ⁶,
LINO ANDRÉS QUIÑONES VALLADOLID⁷

¹ Universidad César Vallejo, Perú

² Universidad Tecnológica del Perú, Perú

³ Universidad Peruana de Ciencias Aplicadas, Perú

⁴ Universidad César Vallejo, Perú

⁵ Universidad Nacional Federico Villarreal, Perú

⁶ Universidad Nacional de Huancavelica, Perú

⁷ Universidad Nacional de Huancavelica, Perú

KEYWORDS

Education Quality
Higher Education
Virtual Learning
Environment
ICT
COVID-19
Teaching
Education

ABSTRACT

Technology has been fundamental in current education, promoting the integration of technology in the teaching and learning process. The COVID-19 pandemic has affected student achievement, especially those with less access to technology. Teachers need to develop digital skills and use ICT effectively in the classroom. It is necessary to support the education and training of teachers, use the data in an informed way and encourage critical thinking in students. ICTs must be used in a pedagogical way to improve educational quality. Teachers need institutional support and must face the challenge of using ICT in a meaningful way.

1. Introduction

In the international context, the health crises experienced in the world require diagnoses for subsequent decision making in the various economic, social, educational and productive sectors in the states of the world, and the unstoppable advance of technology will always be an innovative topic and its impact on the quality of education, it is necessary to be studied, even more so in these times of pandemic, whose emergence has resulted in drastic changes in our country and worldwide. These changes have occurred at all levels of education, both in RBE and technological education, and in university higher education, these changes are being experienced and therefore the study is justified, since it has relevance (Aroquipa et. al. 2019).

The advance of 21st century technology has forced society to insert itself into the so-called network society in which the individual of the third millennium consumes technology by exposure, although it could be a problem, if we analyze the current situation of teachers on the management of

technology, many could say that it is a great opportunity, since this exposure, if properly managed, would be very significant for the individual (Alanya-Beltran et al., 2021). At the current juncture of Covid-19, the various socioeconomic sectors have suffered a strong setback: in the educational space, it refers that 70% of the world's student population has been affected; social isolation, the indefinite closure of educational institutions, the transition from face-to-face to virtuality has marked the pace of educational events in recent weeks and months. Also emphasizing educational quality models given is the case was carried out in the city of Quito the study of the EFQM model, conducted by Cantos and Reyes (2018), which obtained as results where approximately 53% of the rectors or vice rectors have bachelor's degrees in education and barely 5% have a master's degree or doctorate; likewise, 20% have non-university teacher training offered by the Higher Pedagogical Institutes (ISPED), as well as 11% are teachers with normalist training, bachelor's degrees in education and 7% with degrees in other specialties.

Likewise, Ecuadorian education through the Ministry of Education, has changed vertiginously throughout history becoming an unprecedented revolution, since 2016 there has been talk of a new curricular adjustment in the application of educational quality standards, under the levels of General Basic Education and General Unified High School, where it is taken for granted that students should acquire knowledge, enhance their skills and attitudes in specific contexts in adverse situations to provide solutions to different problems (Castagnola et al., 2021). In this sense, the realization of a diagnosis about the nature of the decisions taken, the opportunities that arise in a scenario of danger to the health of people, especially those linked to the education sector (managers, directors, teachers, students, support staff, parents, community, etc.), the way in which technology went from being a support to the educational work and became the fundamental tool of the educational task (in the administrative and classroom work). Considering these aspects could summarize the successes and mistakes, thus constituting a platform to be activated in the face of a new established moment.

While it is important to increase access to education, the real goal of providing education and teaching skills to students in the classroom. This input is based on the results of schooling: the quality of education (Holguin-Alvarez et al., 2020). In the national context, day by day more and more schools are certifying their ISO quality management system and implementing quality models, with the sole purpose of certifying the teacher's skills, in order to enhance the school's management to strengthen the relationship with students and parents. Likewise, teachers still do not have strong practices, which allow them to acquire systematic skills, aimed at results and goals, which incorporate the assessment as a continuous process and that the consequences are of high quality according to the proposed objectives in the educational quality provided in the school premises to publicize the levels of achievement, related to data and information. The pandemic of COVID-19 has evidenced its low digital training in remote or virtual work has meant for a great majority of teachers in the institutions, a frustrating and exhausting work because teachers are not prepared for such activity (Alanya-Beltran & Panduro-Ramirez, 2021). This research aims to explain the reality of many teachers. Since the Ministry of Education has treated the use of technology in an irregular way. In fact, as such, it does not even exist explicitly in the Framework for Good Teaching Performance.

Therefore, the general problem posed in this research is: What were the practices and considerations taken into account in the use of technology in education to improve the quality of education?

The realization of the present study is justified because it is convenient to carry out the study of technology and educational quality is relevant, because it is a specialized system that provides the educational community the same that is carried with good planning, taking into account the context,

continuously, respectful and interactive knowledge that teachers have acquired as well as managers, the same that are aimed at improving the educational quality of students in terms of their learning, educational management and performance of teachers.

2. Development of the research

In order to develop this systematic review research work, the review research method was applied with a descriptive approach; in addition, an analysis was made by means of descriptive comparisons of the results obtained. The inclusion criteria in the selection of the articles were research related to educational quality; for this purpose, the information was searched in the Scopus databases, and the information search was carried out between 2020 and 2022, in open access articles, in Spanish and English, related to the area of social sciences. The information search was conducted using the keywords: ("Educational Technology" OR ICT OR "Electronic Learning" OR "Virtual Learning Environment") AND ("educational Quality" OR accreditation) AND (COVID-19 OR pandemic).

The exclusion criteria were related to systematic reviews, conference abstracts, letters to the editor, reports and essays. When the documents were scanned and in accordance with the inclusion and exclusion criteria, 16 articles were obtained; these are shown below:

Table 1. List of articles selected for the study

N°	Author	Title
1	Ling et al. (2023)	Bibliometric Visualization of Literature on Information and Communications Technology (ICT) in Education
2	De la Ossa & Domínguez (2022)	Impact of ICT on test results standardized during COVID-19. The performance of students in Colombia and Panama
3	López & Martínez-Puente (2022)	ICT and functional diversity. Reference values for the diagnosis and training of Canarian teachers.
4	González Bravo et al. (2022)	Higher education managers' perspectives on quality management and technology acceptance: A tale of elders, mediators, and working bees in times of Covid-19.
5	Carrillo-López & Hernández-Gutiérrez (2022)	ICT and functional diversity. Knowledge of teachers in the Canary Islands
6	Kline (2022)	Programmatic Assessment in a Virtual Learning Environment: Supporting Faculty Engagement for a Successful Quality Assurance System
7	Solano-Barliza et al. (2022)	Democratization of knowledge in times of pandemic among teachers
8	Hell et al. (2022)	Estimating the usefulness of ICT tools for implementing critical thinking in higher education
9	Diaz Dumont et al.	Educational quality and philosophical considerations in

	(2022)	a pandemic context COVID-19
10	Ferede et al. (2022)	Estimating the usefulness of ICT tools for implementing critical thinking in higher education
11	Mikhail et al. (2022)	Changing the Status Quo: Developing a Virtual Sub-Internship in the Era of COVID-19
12	Theodorou et al. (2021)	Multi-institutional Collaborative Surgery Education Didactics: Virtual Adaptations During a Global Pandemic
13	Martinelli et al. (2021)	Educating Anesthesiologists During the Coronavirus Disease 2019 Pandemic and Beyond.
14	Otero & Ortega (2020)	An educational metamorphosis to achieve sustainable human development. Curricular proposal from the Atlántida innovation experience.
15	Abdelhadi (2020)	Effect of COVID-19 pandemic on academic accreditation
16	Flores-Tena et al. (2020)	The use of digital ICT by teachers and their adaptation to current models

Source: Own elaboration

3. Results

The analysis of each of the 16 documents was carried out and the results and conclusions of each are described below:

Table 2. Conclusions of the selected articles

N°	Author	Conclusions
1	Ling et al. (2023)	The incorporation of technology in almost every aspect of education characterizes the era of Education 4.0; moreover, education today relies primarily on the Internet, as well as mobile devices, computers and virtual worlds, as the primary means of sharing knowledge. The integration of technology in education is a necessity that offers significant benefits in the teaching and learning process, thus, with the endless development of technology and the increasing integration of this technology in all disciplines, education studies tend to be on the rise, therefore, extensive studies and innovation in this subject are demanded.
2	De la Ossa & Domínguez (2022)	Three conclusions are presented, due to COVID-19 there was an impact on student performance that was

	evidenced by their low grades, affecting more the population with less access to internet and technological tools, also, after the return to face-to-face teaching, good performances in the evaluations are not expected. Second, the pedagogical strategies implemented by teachers in the process were not the most optimal or pertinent for the context, showing inexperience and improvisation, given their lack of training in technological tools. Third, it is expected that future census exams will begin to indicate the ravages of the pandemic on student learning.	
3	López & Martínez-Puente (2022)	Teachers have incompletely developed digital competence, and use ICT in the classroom in an insufficient way to contribute to the development and generation of knowledge in students; therefore, students should receive good ICT training from teachers, in this sense, despite technological progress, functional diversity is still unknown to the technology sector and has a high potential for development.
4	González Bravo et al. (2022)	Digital transformation implies a strategic approach that must consider the particular and individual characteristics of academics, staff and managers, involving new uses and augmentation of existing information resources, interactions and understanding of ICT.
5	Carrillo-López & Hernández-Gutiérrez (2022)	Teachers in primary and early childhood education obtain greater ICT training than those in secondary education. Likewise, teachers in private schools have greater auditory development and access than those in public institutions. These results should make it possible to identify and improve the quality of the teaching and learning process in order to achieve quality education for students at all educational stages and in all types of schools.
6	Kline (2022)	To support quality educational outcomes, the quality preparation of teachers and school building leaders must be supported. Quality educator preparation relies on assessment and credentialing, as these are the continuous improvement mechanisms that foster ongoing conversations informed by data. How educators engage, educate, and teach deep thinking about data becomes the foundation for how they approach their work with students.
7	Solano-Barliza et al. (2022)	ICTs are considered an important part of the knowledge society, which is why it is important for teachers to be

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- able to count on tools, both in terms of infrastructure and pedagogical mediation, to carry out training actions. The pedagogical sense of the use of ICT provided a learning scenario to favor the enrichment of teachers' practices, based on a class design mediated with technological tools, access to contents, resources and activities that are useful for learning. It is necessary to point out that the use of ICT by teachers was forced by the pandemic, which could indicate that in the event of a return to normal conditions, teachers could return to previous practices.
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- 8 Hell et al. (2022) The availability of diverse information is enormous and creates a false sense of knowledge in any field, on the other hand, regardless of the new situation of COVID-19, the quality of the teaching process is questioned. The critical factor of this work is to highlight the importance of students' perception about the development of critical thinking and the possibilities of using ICT tools in the teaching process, the survey conducted revealed students' preferences in ICT and its implementation in the teaching process.
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- 9 Diaz Dumont et al. (2022) Educational quality is the adequate level of training provided by educational institutions to the student population, which includes motivated and trained teachers, a welcoming, safe and equipped environment, a curriculum in line with reality, updated plans and programs, incorporation of ICTs, among others; which will allow students to develop skills to assertively solve the challenges they face in their daily work and insert themselves appropriately in society, which is constantly evolving, contributing to it and helping to solve social problems. In the unprecedented pandemic situation, the incorporation of ICT in education played an important role. It is impossible in these times to talk about education without thinking about the use of ICTs, since thanks to them it is possible to continue providing education; in addition, it has several benefits, such as awakening the motivation of current students since they have the potential to be important sources for the construction of their learning in an autonomous, didactic and motivating way, which contributes to the quality of education.
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- 10 Ferede et al. (2022) Educational use of ICT for teachers is related to classroom management support, course-related factors and students' ICT competence and access to infrastructure. teachers seek support, encouragement and guidance from university management bodies when they
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		decide to integrate technology in their teaching. In addition, teachers perceive the importance of considering the students' perspective as determinants of their use of ICT; instructors highlighted the importance of considering the students' situation; teachers would be challenged to integrate ICT into their teaching in a meaningful way, thus requiring the right level of ICT competence, attitude, support and access to ICT infrastructure
11	Mikhail et al. (2022)	The virtual clerkship is a novel initiative to maintain high quality medical student urologic education despite the disruption caused by the COVID-19 pandemic. Produced by a national collaboration of experts, ensuring medical students' exposure to important topics in urology and lightening the curricular development burden of residency programs. Virtual internships have enormous potential to expand access to education for medical students and could easily be adopted across all fields of medicine.
12	Theodorou et al. (2021)	Virtual didactics for surgical residents are feasible, well attended, both live and recorded, and have high levels of viewer participation. We have found that careful coordination of time and topics is ideal. Asynchronous viewing capability is particularly important for attendance. As the COVID-19 pandemic continues to impact healthcare systems, training programs must continue to adapt to education via virtual platforms.
13	Martinelli et al. (2021)	In the aftermath of the COVID-19 pandemic, the world of medical education will not be the same; therefore, new and innovative solutions to old education problems must be sought rather than waiting for a return to normalcy. While there are hurdles to overcome in terms of logistics and cost, some tools that are already being introduced and used can and should be adapted based on the best evidence and educational theories. However, novel approaches will need to be developed, with a focus on enabling interactivity without physical proximity. By balancing costs and benefits, there is an opportunity to bring the community together and improve the education of students in this new reality.
14	Otero & Ortega (2020)	Talking about digital transformation with the arrival of COVID-19 entails a reflection on the curriculum, educational centers, teaching-learning methodological processes and the irruption of technology as a facilitator of information. Access to information and its management is the great challenge that the school must

face in order to make possible a qualitative training of all educational agents. Teacher training and student accessibility to technology acquire a fundamental value in the digital transformation of the educational landscape. Completing the new digital teaching profile must be coordinated with the consequences and learning of the COVID stage, and they are called to integrate not only the means at their disposal, but the integrative approach that nature, the urban and technological world can and must address. This challenge of a new culture for a new sustainable and inclusive educational model represents the work of innovation that the new society is entrusted with, and the reconstruction phase.

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- 15 Abdelhadi (2020) The fact that different educational administrations have had to move the educational system from face-to-face to online teaching at a speed of real urgency is causing the use of the Internet to change from being a source of teaching and learning assistance to a necessary solution for the teaching and learning process to continue, thus avoiding the collapse of educational processes. In this sense, education professionals must adapt to the new situation that will influence other aspects of education related to teaching and learning, such as academic accreditations. On the other hand, in order for accreditation processes to be more effective, a proposal for managing academic accreditation processes must be adapted. Finally, online teaching is becoming a solution to further develop academic curricula, not only for institutional leaders or teachers and school administrators, but also for the accreditation body.
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- 16 Flores-Tena et al. (2020) Teachers emphasize the use of ICTs in an easy and dynamic way, improving the development of teaching and learning and at the same time favoring the development of their students. So there is no doubt that the preparation in the use of ICT by teachers is essential; in addition, the debate on the need for teachers to be updated in technology involves time and cost that is becoming more necessary every day; however, teachers who use digital competence in the classroom may be because they are afraid to use ICT for fear that the students know better digital competence. Educational innovation thanks to ICT has been immersed in the classroom as another new methodology of the teaching-learning process. Thus, the demands of ICT in the classroom have led to changes in the teaching methodology that can constitute a didactic tool that increasingly generates greater interest in teaching activities. In addition, the current educational reality
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implies a renewal of the educational system to address latent socio-educational needs in order to better adapt to the new challenges facing society.

4. Conclusions

The incorporation of technology in education has been a fundamental aspect in the era of Education 4.0. Today, education relies heavily on the Internet and mobile devices, which has driven the need to integrate technology into the teaching and learning process. As technology continues to develop and integrate into all disciplines, educational studies are constantly growing, requiring extensive research and innovation in the field.

The COVID-19 pandemic has had a significant impact on the performance of students, especially those with less access to the Internet and technological tools. The implementation of pedagogical strategies during the distance education process has been a challenge, due to the lack of experience and training of teachers in the use of technological tools. Future census exams are expected to reflect the negative effects of the pandemic on student learning.

It is essential that teachers develop digital competencies and effectively use information and communication technologies (ICT) in the classroom. Digital transformation in education involves considering the individual characteristics of academics, staff and managers, as well as using information resources, promoting interactions and understanding ICTs. However, it is important to note that some teachers in primary and early childhood education receive more ICT training than those in secondary education, and teachers in private schools have more resources and access to technology than those in public institutions.

To ensure quality education, it is necessary to support teacher education and training. Assessment and accreditation are important mechanisms to continuously improve educational quality. Educators must be able to use data in an informed manner and foster critical thinking in students. ICTs are considered an integral part of the knowledge society and should be used pedagogically to enrich teaching practices.

Access to information through ICTs is widespread, but it is important to question the quality of the teaching process. Quality education is based on motivated and trained teachers, a safe and equipped environment, updated curricula and the integration of ICTs. During the pandemic, ICTs have played a crucial role in the continuity of education, awakening students' motivation and facilitating the autonomous construction of meaningful learning.

Teachers need support and guidance from educational institutions to effectively integrate ICT into their teaching. The students' perspective should be considered, and teachers should be challenged to use ICT in a meaningful way. Internships and virtual platforms have proven their effectiveness in medical education, and new and innovative solutions should be sought in education rather than waiting for a return to business as usual.

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