

# Innovative education

ISSN 3007-097X

– **1** –  
2025.1



ISSN 3007-097X



9 773007 097007 >

# ICT in the rurality of Peruvian education: Systematic review

**María Rosario Salas Bazalar<sup>1</sup>, Elba María Andrade Díaz<sup>2</sup>, Ana Berta Pacheco Saavedra<sup>3</sup>,  
Rosemary Oblitas Paucar<sup>4</sup>**

1. Universidad César Vallejo, Perú msalasba@ucvvirtual.edu.pe

2. Universidad César Vallejo, Perú emandraded@ucvvirtual.edu.pe

3. Universidad César Vallejo, Perú apachecos@ucv.edu.pe

4. Universidad César Vallejo, Perú roblitasp@ucv.edu.pe

## ABSTRACT

The objective was to analyze articles on the methodology of the insertion of ICT in rural schools in our country, evaluating the research from 2011 to 2021, referring to the information and the results of the improvement indicators regarding the subject. Inclusion was used in the methodology, where the titles of the investigations were considered; the reading, analysis of the summary and conclusions of the investigations; objectives; range of publications of the last ten years, approximately. The search strategy were the following ones in the databases: Scielo, academic Google, La Reference, Virtual Library Concytec, Alicia and Scopus and Boolean operators AND and NOT. In addition, search equations were established alternating the words: ICT, RURAL EDUCATION, BASIC EDUCATION. This shows that the use of digital resources and ICT tools favor the significance of learning, as they develop the ability to understand and understand technology, establishing the closing of the digital gap that marks the learning results of students in these areas.

**Keywords:** ICT (information and communication technology), learning process, digital tools, rural education.

## 1. Introduction

The current context in world education showed, due to the onset of the pandemic, the technological gaps in all its modalities. Moreover, this situation highlighted the real

level of education, especially in rural areas, and its enormous deficiencies in the use of the tools offered by ICTs to make learning viable in these circumstances. Granda, Espinoza and Mayón (2019, p. 105); Esteban, García, Morte and Nogales (2020) affirm that these are key

elements for the development of the various sectors of today's society, particularly in educational systems as they facilitate an interactive teaching-learning process, within the context of communicative skills.

However, in the real context, according to GRADE, Grupo de Análisis para el Desarrollo, 20.8% of Peru's population lives in rural communities (2020, para. 2). According to the Economic Commission for Latin America and the Caribbean—ECLAC (2020), in Latin America, 90% of rural households do not have access to the Internet and, within this group, there is a group of children between five and twelve years of age; to this problem, the low connection speed is added, which limits or does not allow distance education in an adequate manner.

This reality evidences that the work done in the rurality of Peruvian education is still going through a process of change and improvements, such as the insertion of ICT. Unesco (2015) and Soto and Molina (2017, p. 282) mention that the use of digital and technological resources allowed teachers and others to successfully execute education planning at the national level. These resources make it possible for learning improvements to be routed in such a way that equality options are viable and contribute to the growth of rural communities, providing their students and inhabitants, in general, with socialization and empowerment tools to act in the future. In addition, it corroborates the improvement

options that can be produced in these communities, from the insertion of ICT, and, after analyzing the necessary literature, it is affirmed that improvements in these areas are necessary to generate equal opportunities in the improvement of learning.

Núñez (2019), regarding communication and the search for information, mentions the evolution of these, including the teaching role. A few years ago, "the teacher was the only one who knew the contents" or to clarify any doubts, one would check an encyclopedia; today, however, from any device with internet access, a wide range of information can be accessed. Then, the teacher acquires the role of educational guide, since he/she will finally lead the process in discerning between valid and false information.

Taking into account the above, this research aims to analyze articles on the methodology of ICT insertion in rural schools in our country, assessing research from 2011 to 2021, since it is necessary to highlight the changes in education and how the use of ICT can be a decisive factor for the reality of these areas to be transformed, assuming the fact that the authorities need to act to bring, where appropriate, the technological plans to these geographical areas.

## **Background**

De La Serna, Gonzáles and Navarro (2018) worked a literature review of 50 articles and

scientific papers of the last decades on the problem of incorporating ICT in the educational context of the preschool level and its effectiveness results. The physical-psychological, pedagogical and sociological dimensions were identified. It is concluded that ICT should be considered within the educational process, as well as in the school environment.

Huerta (2021) investigated the use of ICT in the development of communicative competencies in first grade children. The objective was to determine the influence that the use of ICT has on the development of competencies, according to the reality observed from a positivist paradigm. The population and sample consisted of 30 students. It is concluded that ICTs are capable of directly influencing the development of the proposed competencies.

Galindo (2021) conducted research on meaningful learning through virtual environments in 5-year-old children in public institutions. She used a qualitative approach and humanistic-interpretative paradigm, and also used the ethnographic and phenomenological methods to interpret and understand the phenomena observed in the context. Its objective was to understand the learning strategies that contribute to meaningful learning in virtual environments. It is concluded that technology allows to evolve in the teaching-learning process and students, parents and teachers should be involved.

Medina Sánchez, Velásquez Tejada,

Alhuay-Quispe and Aguirre Chávez (2017) analyzed the creative aspect in young children, responding to a purpose of the Ministry of Education of Peru, which seeks new proposals to improve pedagogical practice. This was of qualitative approach. The sample was intentional and selected by criterial sampling. It was concluded that the application of ICT contributes to the development of creativity.

## **2. Methodology**

This systematic review contemplates the evaluation of relevant researches referred to the topic of ICT insertion in rural areas, considering their methodology and the results that show indicators of improvement regarding the topic.

### **2.1. Data collection process**

For this purpose, the following databases were selected: Scielo, Google Scholar, La Referencia, Concytec Virtual Library, Alicia and Scopus. The Boolean operators AND and NOT were also used, as well as search equations alternating the words: ICT, RURAL EDUCATION, BASIC EDUCATION.

### **2.2. Inclusion and exclusion criteria**

The following aspects were considered for inclusion: Title of the research, reading and analysis of the abstract, conclusions of the research, research objective of the articles, and range of publications from 2011 to 2021. For exclusion, the following were taken into account: articles not available or without access,

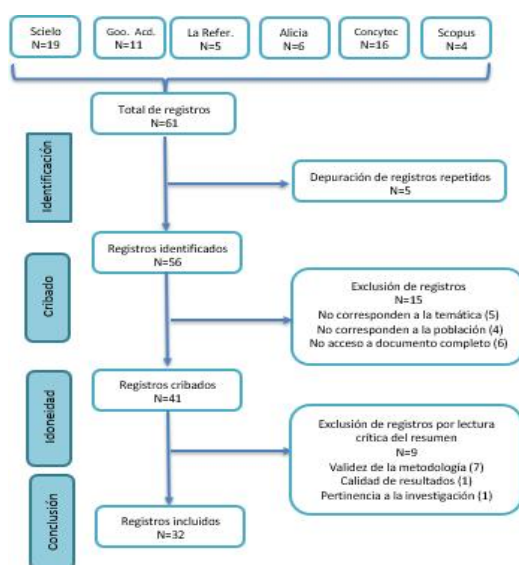
articles that did not relate to the characteristics of the research and books or theses. A total of 76 publications were found, of which 61 turned out to be aligned with the research objective; although upon reading in depth, 15 more articles that did not fully fit the established

criteria were excluded. Finally, the data were consolidated as follows: 19 articles in Scielo: 11, Google academic; 5, The Reference; 16, Concytec virtual library; 6 in Alicia; 4, in Scopus.

**Table 1.** Included and excluded articles.

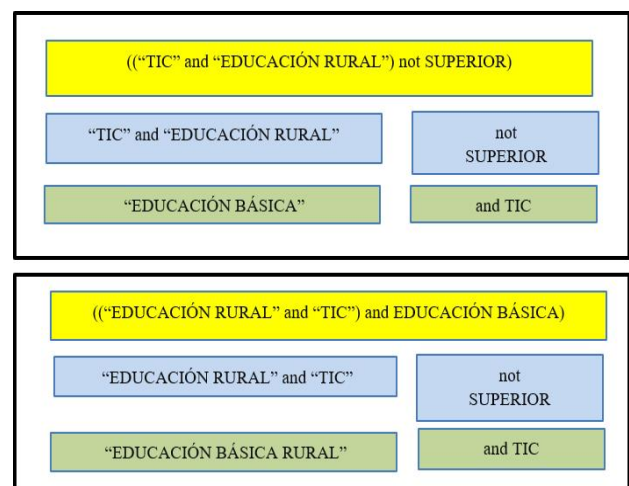
Data base	Items included	Excluded items
Scielo	22	3
Academic Google	11	0
The Reference	8	3
Alicia	9	3
Concytec	19	3
Scopus	7	3

The number of articles selected and how many were purified to be able to know and open the subject in a convenient way can be appreciated.



**Figure 1.** Flow chart.

The process of exclusion of the selected articles from the database until the suitability of the articles is reached is observed.



**Figure 2.** Search equation.

Boolean operators and search equations are used alternating the words: ICT, RURAL

EDUCATION, BASIC EDUCATION

3. Results

A total of 61 articles were selected, but only 53 were left when the discard or exclusion

criteria were used. Table 2 below shows the databases for the systematic review and the number of scientific articles included and discarded or excluded.

Table 2. Selected research articles.

N.*	Base de datos	Autor	Título del artículo	País	Año	Inclusión
1	Scopus	Dillon, Freire, Rojas, Espinoza	Educación y TIC: El uso de la teoría de redes en el análisis de relaciones sociales y académicas en contextos educativos.	Ecuador	2020	Se alinea al objetivo del artículo
2	Scopus	Orellana, Hernández, Baz y Rodríguez	Evaluar competencias digitales en Educación Infantil desde las prácticas de aula.	España	2021	Se alinea al objetivo del artículo
3	Scopus	Hung, Cobos, Sartori	Factores determinantes del aprovechamiento de las TIC en docentes de educación básica en Brasil Un estudio de caso.	Brasil	2016	Se alinea al objetivo del artículo
4	Scopus	Romo	Las TIC y los escolares del medio rural, entre la brecha digital y la educación inclusiva.	España	2018	Se alinea al objetivo del artículo
5	Alicia	Padilla, Medina	TIC, desarrollo y jóvenes. Un estado de la cuestión	Perú	2018	Se alinea al objetivo del artículo
6	Alicia	Instituto de Estudios Peruanos	Digitalización y desarrollo rural: ¿Hasta qué punto van de la mano?	Perú	2020	Se alinea al objetivo del artículo
7	Alicia	Milla	El uso de las TIC en el desarrollo del proceso enseñanza – aprendizaje en los docentes de las instituciones educativas de la zona rural, Yungay, 2017	Perú	2018	Se alinea al objetivo del artículo
8	Alicia	Florián	"integración de las TIC'S en un modelo educativo a distancia y calidad de aprendizaje en estudiantes de zona rural	Perú	2020	Se alinea al objetivo del artículo
9	Alicia	Laura	Una laptop por niño en escuelas rurales del Perú: un análisis de las barreras y facilitadores	Perú	2011	Se alinea al objetivo del artículo
10	Alicia	Huaranoca, Lima	Tecnologías de información y comunicación (TIC) y estilos de aprendizaje en estudiantes de una institución educativa estatal de Huancavelica	Perú	2020	Se alinea al objetivo del artículo
11	Coneytec	Vargas, Vega	Acercamiento al perfil de uso de TIC por docentes en el sector rural colombiano	Colombia	2015	Se alinea al objetivo del artículo
12	Coneytec	Hernández, Jurado, Romero	Análisis de publicaciones hispanoamericanas sobre TIC en escuelas y zonas rurales	Colombia	2014	Se alinea al objetivo del artículo
13	Coneytec	Álvarez, García	Brecha digital y nuevas formas académicas en la escuela rural española durante el confinamiento	España	2021	Se alinea al objetivo del artículo
14	Coneytec	Salinas, De Benito	Competencia digital y apropiación de las TIC: claves para la inclusión digital	España	2020	Se alinea al objetivo del artículo
15	Coneytec	Boix	Competencias del profesorado de la escuela rural catalana para abordar la dimensión territorial en el aula multigrado	España	2020	Se alinea al objetivo del artículo
16	Coneytec	Salgado, Gómez, Pintor	Educación rural y la adquisición de competencias laborales: una innovación mediante el uso de recursos digitales	España	2017	Se alinea al objetivo del artículo
17	Coneytec	Anaya, Montalvo, Ignacio, Arispe	Escuelas rurales en el Perú: factores que acentúan las brechas digitales en tiempos de pandemia (COVID-19) y recomendaciones para reducirlas	Perú	2021	Se alinea al objetivo del artículo
18	Coneytec	Ramírez, Cañedo, Orgaz, Domínguez	Evaluar competencias digitales en Educación Infantil desde las prácticas de aula	España	2020	Se alinea al objetivo del artículo

19	Concytec	Piaseencia-Gonzales	Infancia y tele-escuela en preescolares rurales: reflexiones a partir de experiencias docentes previas a la pandemia	México	2020	Se alinea al objetivo del artículo
20	Concytec	Marín, Cruz	La apropiación social de tecnologías móviles, una oportunidad para la formación ciudadana	España	2016	Se alinea al objetivo del artículo
21	Concytec	Soto, Molina	La escuela rural en Colombia como escenario de implementación de TIC	Colombia	2017	Se alinea al objetivo del artículo
22	Concytec	Cucumbá, Alfonso, Cepeda	Las TIC en el aula multigrado. Una experiencia de formación de profesores	Colombia	2020	Se alinea al objetivo del artículo
23	Concytec	Guerrero	Las TIC, educación rural y currículum	Venezuela	2014	Se alinea al objetivo del artículo
24	Concytec	Ibarra, Atzacusi, Huamán, Barzola	Mejorando la disponibilidad de recursos educativos digitales para enseñar en escuelas rurales sin acceso a internet	Brasil	2017	Se alinea al objetivo del artículo
25	Concytec	Ramón, Vilchez	Tecnología étnico-digital: recursos didácticos convergentes en el desarrollo de competencias matemáticas en los estudiantes de zona rural	Colombia	2019	Se alinea al objetivo del artículo
26	Concytec	Avendaño-Porras	Uso de tic en la educación primaria indígena multigrado de comunidades del sur de México	México	2020	Se alinea al objetivo del artículo
27	Google Académico	Montes, Díaz, Uribe	Educación rural y TIC: una revisión de la literatura académica desde una perspectiva bibliométrica	España	2020	Se alinea al objetivo del artículo
28	Google Académico	Campos	Competencias Profesionales Docentes en Educación Inicial: Revisión Sistemática.	Peru	2021	Se alinea al objetivo del artículo
29	Google Académico	Ramos, Cáceres, Soler, Marín	El uso de las TIC para la animación a la lectura en contextos vulnerables: una revisión sistemática en la última década	España	2020	Se alinea al objetivo del artículo
30	Google Académico	Forero	Escuela nueva una revisión descriptiva de su evolución en la educación rural	Colombia	2019	Se alinea al objetivo del artículo
31	Google Académico	Roma	La accesibilidad en los entornos educativos virtuales: una revisión sistemática 2021	Argentina	2021	Se alinea al objetivo del artículo
32	Google Académico	Gonzales, Guijarro	La aplicación e implementación de las TIC en el alumnado con NEE	España	2020	Se alinea al objetivo del artículo
33	Google Académico	Jiménez, Muñoz, Sánchez	La competencia digital docente, una revisión sistemática de los modelos más utilizados	España	2021	Se alinea al objetivo del artículo
34	Google Académico	Boza, Torres	Perspectiva sobre la educación inicial y el acceso a las TIC: Revisión crítica de la literatura	Ecuador	2021	Se alinea al objetivo del artículo
35	Google Académico	Esteban, García, Nadal, Nogales	The Rural Digital Divide in the Face of the COVID-19 Pandemic in Europe—Recommendations from a Scoping Review	España	2020	Se alinea al objetivo del artículo
36	Google Académico	Segura, Solano, Sánchez	Uso didáctico de las TIC en los colegios rurales agrupados de la región Murcia	España	2018	Se alinea al objetivo del artículo
37	Google Académico	Tárraga, Sanz, Pastor, Fernández	Análisis de la autoeficacia percibida en el uso de las TIC de futuros maestros y maestras de Educación Infantil y Educación Primaria	España	2017	Se alinea al objetivo del artículo
38	Scielo	Chávez, Cantú, Rodríguez	Competencias digitales y tratamiento de información desde la mirada infantil	México	2015	Se alinea al objetivo del artículo

39	Scielo	Peirano, Puni, Astorga	Educación rural: oportunidades para la innovación	Uruguay	2015	Se alinea al objetivo del artículo
40	Scielo	Urquidi, Calabor, Tamarit	Entornos virtuales de aprendizaje: modelo ampliado de aceptación de la tecnología	México	2017	Se alinea al objetivo del artículo
41	Scielo	Lagos, Tarifeño, Abello	Exploración de actividades digitales asincrónicas escritas en futuros docentes de Educación Básica	Colombia	2019	Se alinea al objetivo del artículo
42	Scielo	Hernández, Gómez, Balderas	Inclusión de las tecnologías para facilitar los procesos de enseñanza-aprendizaje en ciencias naturales	Costa Rica	s.f	Se alinea al objetivo del artículo
43	Scielo	Da Silva, Sommer, Rocha	Integration of technology in education: proposal for a teacher training model inspired by Tpack	Brasil	2021	Se alinea al objetivo del artículo
44	Scielo	Porrás, López, Huerta	Integración de TIC al currículum de telesecundaria	México	2010	Se alinea al objetivo del artículo
45	Scielo	Pérez	La competencia mediática en el currículo escolar: ¿Espacio para innovaciones educativas con tecnologías de la información y la 2019 comunicación?	España	2016	Se alinea al objetivo del artículo
46	Scielo	Granda, Espinoza, Mayón	Las TIC como herramientas didácticas del proceso de enseñanza aprendizaje	Cuba	2019	Se alinea al objetivo del artículo
47	Scielo	Trejo, Marcano	Propuesta de innovación educativa mediante el uso de las TIC para la promoción de valores ambientales en la educación primaria venezolana	Venezuela	2013	Se alinea al objetivo del artículo
48	Scielo	Cuberos, Vivas	Relación entre didáctica, gerencia y el uso educativo de las TIC	Costa Rica	2017	Se alinea al objetivo del artículo
49	Scielo	Villarreal, López, Bernal, Escobedo, Valadez	Rendimiento académico de alumnos de secundaria beneficiarios del Programa Oportunidades en comunidades rurales y semirurbanas de Chiapas y Nuevo Leon	México	2009	Se alinea al objetivo del artículo
50	Scielo	Mellado, Rivas	Riesgos en el uso de TIC en alumnos de enseñanza básica El caso de un colegio en Chillán, Chile	Bolivia	2015	Se alinea al objetivo del artículo
51	Scielo	Vértiz, R. Pérez, Faustino, Vértiz, J.	Tecnología de la información y comunicación en estudiantes del nivel primario en el marco de la educación inclusiva en un Centro de Educación Básica Especial	Perú	2018	Se alinea al objetivo del artículo
52	Scielo	Cabello, Ochoa, Felmer	Tecnologías digitales como recurso pedagógico y su integración curricular en la formación inicial docente en Chile	Chile	2020	Se alinea al objetivo del artículo
53	Scielo	Varela, Valenzuela	Uso de las tecnologías de la información y la comunicación como competencia transversal en la formación inicial de docentes	Costa Rica	2019	Se alinea al objetivo del artículo
54	Scielo	Acosta, López, Donoso	La lúdica como estrategia para el desarrollo de la creatividad en los niños del nivel inicial.	Ecuador	2020	Se alinea al objetivo del artículo
55	Scielo	Navarro, Morales, Carbo	Diseño de aula virtual para la formación Blended Learning: Asignatura Desarrollo Humano y calidad de vida	Ecuador	2017	Se alinea al objetivo del artículo
56	Scielo	Grilli, Caleros	Hacia una biología escolar significativa: Programación didáctica desde una postura socioconstructiva, con utilización de recursos TIC	Uruguay	2018	Se alinea al objetivo del artículo
57	La Referencia	Núñez	Las TIC y las nuevas metodologías	España	2019	Se alinea al objetivo del artículo

58	La Referencia	Baño, Arboleda, Inmaculada	Types of ICT and their use in education and entertainment	España	2016	Se alinea al objetivo del artículo
59	La Referencia	Guzman, Arriaga, Cobos	Las TIC y su influencia en el desarrollo psicosocial	Ecuador	2019	Se alinea al objetivo del artículo
60	La Referencia	Lizcano, Barbosa, Villamizar	Aprendizaje colaborativo con apoyo en TIC: concepto, metodología y recursos	Colombia	2017	Se alinea al objetivo del artículo
61	La Referencia	Real	Materiales didácticos digitales: un recurso innovador en la docencia del siglo XXI	España	2018	Se alinea al objetivo del artículo

Here you can see all the articles selected from the following databases: Scielo, Google Scholar, La Referencia, Biblioteca virtual Concytec, Alicia and Scopus.

**Table 3.** Research conducted by country.

Country	Number of items	Percentage
Spain	19	32%
Peru	9	14.7%
Colombia	8	13.1%
Mexico	6	9.8%
Ecuador	5	8.1%
Brazil	3	4.9%
Costa Rica	3	4.9%
Uruguay	2	3.2%
Venezuela	2	3.2%
Argentina, Cuba, Bolivia, Chile	4	6.5%

Table 3 and Figure 3 show the research carried out by country and percentages.



**Figure 3.** Research conducted by country.

One of the most important points to consider was the countries where these researches have been carried out, which point to the success in learning that ICTs can generate in rural environments. The 61 research articles show that Spain has 19 (32%), followed by Peru with 9 (14.7%). These are the countries

with the most research related to the objective of this systematic review. In Colombia, there are 8 investigations (13.1%), followed by Mexico with 6 investigations (9.8%), Ecuador with 5 (8.1%), Brazil and Costa Rica with 3 (9.8%) and 6 other countries with 8 investigations (12.9%).

**Table 4.** Research conducted by year.

Year	Number of items	Percentage
2021	8	13.5%
2020	16	26.2%
2019	8	13.1%
2018	8	13.1%
2017	8	13.1%
2016	4	6.5%
2015	4	6.5%
2014	2	3.2%
2013	1	1.6%
2011	1	1.6%
s.f.	1	1.6%



**Figure 4.** Investigations carried out per year.

Table 4 and Figure 4 show the number of articles included from 2011 to 2020. Therefore, a sample of 32 research articles is taken where

it is evident that the year in which more articles were published is the year in which they were published.

Table 5 shows the benefits achieved after the application of ICT in the rurality of our education:

**Table 5.** Benefits achieved by the application of ICT.

Benefits	No. of items
Improvement of learning achievements	6
Development of digital competencies	5
Closing of digital gaps	7
Insertion of ICTs in rural schools	7
Role of the teacher as a technological mediator	7

Articles according to the research objective was 2020 with 16 (26.2%). An analysis was made of the most recurrent and relevant benefits of the research articles included in this systematic review. From the sample of 32 articles, 6 indicate that the most recurrent benefits are the improvement of learning achievements in rural areas; 5 show the development of digital competencies; 5 indicate the closing of digital gaps; 7 show the insertion of ICT in rural schools and 7 mention the role of the teacher as a technological mediator.

## Development

Today's world requires a transformation in all aspects; but it must start with education, especially, in the new technological trends that are inserted from the early years of training and are perfected throughout the basic education of students.

Real (2019) states that technological

progress is unstoppable and is found in the classroom through the use of new teaching methods. This use of ICT has transformed the elaboration, acquisition and transmission of knowledge; it also promotes the use of innovative tools for the achievement of learning. The broad educational possibilities offered by these tools are given in digital materials with access, in many cases, free of charge. Also, they reach a great importance because it is a source of information and axis for the development of innovative educational methods. These represent the doors to improve the quality of education.

Ricardo Barreto (2017), citing Zabalza (2007), mentions that the use of ICT generates creativity and innovation in students and, also, new possibilities of interaction. However, for this to be realized, it is necessary the transformation of the rural context and that the new resources are integrated into the formative curriculum.

ICTs, within the reach of children and adolescents, provide the possibility of access to new paradigms of relationship with the social context. That is, to the generation of new social skills (Guzmán, Arriaga and Cobos, 2019, citing Espinoza and Rodríguez, 2017; Grilli and Calleros, 2018).

The management of digital tools in all areas of the country should be established as an educational priority, since digital content can be adapted to favor educational groups within daily learning practices; since the educator is a transforming agent of his reality. For this, he must be permanently trained in his work, in the construction and reconstruction of his educational practices. The development of new ICTs seeks to articulate the formative accompaniment with learning communities in b learning mode so that an environment of preparation, cooperative work, dialogue of knowledge, reflection of practice that help transform their environment with innovative tools is consolidated (Briceño and Herrera, 2018; Lizcano, Barboza and Villamizar, 2019).

This affirms the relevance of ICT in rural schools for the development of not only digital skills; but social skills among students, including creativity and logical reasoning.

#### 4. Conclusions

The use of digital resources and ICT tools, throughout the literature analyzed, favors the significance of learning, as they develop the

capacity for technological understanding and comprehension, establishing the closing of the famous digital gap that marks the learning results of students in these areas, since it allows them to acquire a new form of digital literacy that opens possibilities throughout their school life.

#### Bibliographic References

1. Briceño, M. y Herrera, R. (2018). Comunidad de aprendizaje b-Learning para acompañar equipos de calidad en los colegios de Fe y Alegría. Vol. 18. 13.
2. Cepal (2020). Universalizar el acceso a las tecnologías digitales para enfrentar los efectos del COVID 19. Informe especial COVID 19 N° 07. <https://bit.ly/3mqytGm>
3. De la Serna, A., González, J. y Navarro, Y. (2018). Las tecnológicas de información y Comunicación en el preescolar: Una revisión bibliográfica. *Campus Virtuales*, 7(1), 19-31.
4. Esteban, M., García, M., Morte, T., y Nogales, A. (2020). The Rural Digital Divide in the Face of the COVID-19 Pandemic in Europe—Recommendations from a Scoping Review *Informatics*. doi:10.3390/informatics7040054. [www.mdpi.com/journal/informatics](http://www.mdpi.com/journal/informatics)
5. Galindo, D. (2021). Aprendizaje Significativo a través de los entornos virtuales en niños de 5 años de instituciones públicas. [Tesis Doctoral] Universidad César Vallejo.
6. GRADE. (2020). Cifras sobre la educación rural en el Perú. <http://www.grade.org.pe/creer/educacion-rural-en-el-pe-ru/cifras/>
7. Granda, L., Espinoza, E., y Mayon, S. (2019). Las TIC como herramientas didácticas del proceso de enseñanza-aprendizaje. *Revista Conrado*, 15(66), 104-110. <http://conrado.ucf.edu.cu/index.php/Conrado>
8. Grilli, J. y Calleros, G. (2018). Hacia una biología escolar significativa. Programación didáctica desde una postura socio-constructiva, con utilización de recursos tradicionales y TIC. *Revista Biografía*.

Escritos sobre la Biología y su enseñanza. Vol. 11.

9. Guzmán, K., Arriaga, P. y Cobos, A. (2019). Las TIC y su influencia en el desarrollo psicosocial. Apuntes universitarios. DOI: <https://doi.org/10.17162/au.v10i2.434>

10. Huerta L., E. (2021). El uso de las TIC en el desarrollo de las competencias comunicativas en niños de primer grado. [Tesis doctoral, UCV] <https://hdl.handle.net/20.500.12692/57997>

11. Lizcano, A. R., Barboza, J. W. y Villamizar, J. D. (2019). Aprendizaje colaborativo con apoyo en TIC: concepto, metodología y recursos. *Revista Internacional de Investigación en Educación*, 12 (24), 5-24. doi: 10.11144/Javeriana.m12-25.acat.

12. Medina Sánchez, N., Velásquez Tejada, M., Alhuay – Quispe, J. y Aguirre Chávez, F. (2017). La creatividad en los niños de preescolar, un reto de la educación contemporánea. *Revista Iberoamericana sobre Calidad, Eficacia y Cambio en Educación*, 15(2), 153-181. doi:10.15366/reice2017.15.2.008.

<https://www.redalyc.org/pdf/551/55150357008.pdf>

13. Núñez, M. (2019). Las TIC y las nuevas metodologías. Entrevista.

14. Real, C. (2019). Materiales didácticos digitales: un recurso innovador en la docencia del siglo XXI. *3C TIC. Cuadernos de desarrollo aplicados a las TIC*, 8(2), 12-27. doi: <http://dx.doi.org/10.17993/3ctic.2019.82.12-27>.

15. Ricardo Barreto, C. (2017). Ambientes virtuales de aprendizaje. Retos para la formación y el diálogo intercultural. <https://doi.org/10.2307/j.ctt2050wjh>

16. Soto, D. y Molina, L. (2017). La escuela rural en Colombia como escenario de la implementación de las TIC. *Saber, ciencia y libertad*. Vol. 13, No. 1.

17. Unesco. (2015). *Replantear la educación: ¿Hacia un bien común mundial?* Place de Fontenoy, 75352 PARÍS 07 SP, Francia.