Contemporary Educational Researches Journal

Volume 15, Issue 1, (2025) 45-57

www.cerj.eu

The role of ICT in developing Peru's 'I learn at home' distance education strategy

Enaiby Enaidy[a1,] Universidad César Vallejo, Lima, Perú ereynosa079@gmail.com

Suggested Citation:

Enaidy, E. (2025). The role of ICT in developing Peru's 'I learn at home' distance education strategy. *Contemporary Educational Research Journal*. *Contemporary Educational Research Journal*, *15*(1), 45-57. https://doi.org/10.18844/cerj.v15i1.9630

Received from August 8, 2024; revised from November 3, 2024; accepted from January 18, 2025.

Selection and peer review under the responsibility of Assoc. Prof. Dr. Deniz Ozcan, Samsun Ondokuz Mayıs University, Turkey.

Abstract

This study examined the pedagogical use of information and communication technologies in teachers of the Local Educational Management Unit, Chiclayo, Peru, during the COVID-19 pandemic and evaluated the implementation of the distance education strategy "I learn at home." ICTs played a crucial role in enabling remote learning and fostering high-impact pedagogical strategies. Prior research emphasized their importance in developing digital competencies essential for professional and everyday life. However, there was a need to assess their effectiveness in pedagogical management within the local educational context. A quantitative, descriptive, and non-experimental approach was adopted, using stratified probability sampling with a finite population of 6111 teachers and a sample of 909 from Initial, Primary, and Secondary Education. Data were collected through a structured questionnaire with 30 items distributed via Google Forms. The findings indicated no significant differences in teachers' pedagogical use of ICTs for implementing the distance education strategy. Despite this, teachers who regularly integrated ICTs into learning activities contributed to the development of conceptual knowledge, skills, and critical evaluative judgment, fostering comprehensive student development. These findings underscore the importance of continuous teacher training to enhance ICT-based pedagogical strategies in distance education.

Keywords: Computer-aided teaching; educational software; ICT; long-distance education; online learning; teacher

* ADDRESS FOR CORRESPONDENCE: Name, Surname, Universidad César Vallejo, Lima, Perú
E-mail address: ereynosa079@gmail.com

Enaidy, E. (2025). The role of ICT in developing Peru's 'I learn at home' distance education strategy. *Contemporary Educational Research Journal*. *Contemporary Educational Research Journal*, *15*(1), 45-57. https://doi.org/10.18844/cerj.v15i1.9630

1. INTRODUCTION

According to the United Nations Children's Fund (UNICEF), with the global outbreak of COVID-19, around 1,576,021,818 students were out of school worldwide. More than 160,000,000 belonged to Latin America and the Caribbean Caribe (UNICEF, 2020; UNESCO, 2020). In this context, Information and Communication Technologies (ICT) were positioned as unavoidable allies for the new educational scenario as a fundamental support for sharing knowledge, ideas, and experiences, generating learning, and demonstrating attitudes and behaviors, especially in school social networks (Becerra Ortiz, 2016).

However, before COVID-19, ICTs were being used poorly, so much so that in Spain, the incorporation of ICTs demanded the training of teachers so that they could know how and for what ICTs are used in schoolchildren (Palomo, 2018). In Spain, it was found that 53% of the participants had basic ICT skills, this figure being lower than the European average (56%) (Sánchez, 2018). In Barcelona, numerous teachers reluctant to use ICT were identified; for this reason, institutions needed to undertake training programs for teachers to develop the necessary digital skills required by the educational process to limit technological and pedagogical training deficiencies (Vega-Gea et al., 2021). However, in the same country, other studies highlight the importance of ICT in the educational system to promote the teaching-learning process, generating different roles for teachers and students, allowing them to work constructively, and fostering greater autonomy and responsibility to the teacher when they have to make decisions with the support of technologies (Colás Bravo et al., 2018). Research shows that the aspects that have the most significant impact are the incorporation of ICT in educational institutions, training in digital skills, pedagogical and didactic use of the curriculum, and the performance of teachers will contribute to leadership to accept the use and application of technologies as innovative elements in the Classroom (Haarala-Muhonen et al., 2023; Fernández Cruz et al., 2018; Vandeyar & Adegoke 2024).

Studies carried out in Colombia warn that, for the participating teachers, the use of technological elements in the Classroom is not necessary because they constitute potential distractions; according to them, video games and cell phones contribute little or nothing to teaching (Ghitis Jaramillo & Alba Vásquez, 2019); They also identified educational centers where only 20% of the available computers worked and were used by the authorities. Therefore, students did not have access to them (Peláez, 2019). Consequently, in Ecuador, teachers received training in the use of ICT to have more excellent communication and participation among students, with forums, blogs, email, and others. They were motivated to use synchronous tools to promote constructive learning in real-time (Alcívar Trejo et al., 2019). However, in Chile, training for the use of ICT for educational purposes offers a wide range of opportunities to strengthen and innovate in the teaching-learning process, thereby providing access to the global knowledge that today's society requires (Arancibia et al., 2020).

With the start of the quarantine in Peru, teachers were suddenly forced to implement methodologies, strategies, and techniques related to ICT; In this way, a new way of educating was legitimized whose supports rest on the dialectical relationship between teachers, students, parents, and ICT; testing the adaptability of all agents in this new educational scenario. Teachers needed to make adjustments and assume the updating of their skills and training in the use of ICT as a permanent and incremental need, essential to develop a quality, comprehensive, systemic, and transformative education that contributes to the socio-educational development of the being (García González et al., 2010). However, the use of ICT for educational purposes in Peru currently continues to be a multidimensional problem, which in addition to the deficit of available technological equipment, is also linked to the lack of training for teachers, students, and parents, the economic difficulties in accessing high-speed Internet, the uneven distribution of internet access nationwide, as well as the economic and cognitive limitations of students and parents; however, a large mass of teachers are sensitized and trained to deal with ICTs following the current demands of modernity and the global commitment to implement ICTs for educational purposes (Guizado Osco et al., 2019). In this sense, the Ministry of Education, Peru, through MINEDU (2020) Ministerial Resolution No. 160-2020, as of April 6, 2020, ordered the national implementation of the distance education strategy "I learn at home", to guarantee the educational service in the institutions of regular basic Education; levels of initial, primary, secondary Education

for minors, alternative basic education and special primary education (public and private) (MINEDU, 2020; MINEDU, 2021; Prado, 2020).

1.1. Purpose of study

"I learn at home" is broadcast on various channels of Peruvian television, radio, and social networks in the form of distance education. Working using this strategy means that the teacher fulfills the role of facilitator of the educational process and focuses, fundamentally, on enabling the active participation of families in the accompaniment of their children (MINEDU, 2020). This strategy has been used throughout 2020 and 2021; Because 100% of teachers carry out their work at a distance; however, students and teachers have shown limitations to working in this way due to the lack of Internet, weak connectivity signal, outdated technological equipment to capture quality signal, distance from teachers' housing, marginal urban and rural areas of the country, little knowledge of technologies and software on the part of teachers. This reality motivated the approach to the use of ICT in teachers of the Local Educational Management Unit, Chiclayo-Peru (UGEL, Chiclayo-Peru; for its acronym in Spanish) in the context of COVID-19.

The question arises: At what level is the pedagogical use of ICT in teachers at UGEL, Chiclayo-Peru, to develop the "I learn at home" strategy? This research aimed to identify and evaluate the pedagogical use of ICT in teachers at UGEL, Chiclayo, Peru, to develop the "I learn at home" strategy. It is based on the hypothesis that there is a medium level in the pedagogical use of ICT in teachers at UGEL, Chiclayo, Peru, to develop the "I learn at home" strategy.

2. METHOD AND MATERIALS

2.1. Study design

The research responds to a positivist paradigm under a quantitative, descriptive approach and a non-experimental design. The indicators to assess were sociodemographic data and pedagogical and technological use of ICT.

2.2. Participants

The population consisted of 6111 teachers of Initial, Primary, and Secondary Education. It was worked under a stratified probability sampling with a finite population and a margin of error of 3.08% and a confidence level of 95%; Using the formula: n = Z2 (p * q) / (e ^ 2 + (Z ^ 2 (p * q)) / N), selecting 869 participants from the total population at a rate of 305 (35.1%) Education teachers Initial, 299 (34.4%) from Primary Education, and 265 (30.5%) from Secondary Education. Inclusion criteria: teachers of the initial, primary, and secondary levels with continuous access to the Internet, who were working on the "I learn at home" strategy; teachers with knowledge and mastery of the Google drive application, voluntary participation in research, such as exclusion criteria, teachers with health problems, licensed at work, those who do not have technological equipment and internet access.

Of the 869 teachers included, 79.6% were women, and 20.4% were men. Regarding geographical location, 67.3% are located in urban areas and 32.7% in rural areas in the Lambayeque region of Peru. Regarding teaching experience, 79.2% had between 6 and 30 years of teaching experience; only 9.2% accredited 1 to 5 years of experience. Regarding the age group, the highest concentration was located between 36 and 60 years, with 79.5% of the total sample. Next, the group from 21 to 35 with 13.7%, the group from 31 to 40 was located at 11.6%, and in the range from 61 to 65 with 6.8%.

2.3. Data collection tool

As a technique for collecting information, the survey was considered, consisting of a questionnaire structured by 30 questions. Questions 1 to 15 corresponded to the pedagogical dimension and were answered through a Likert scale. Questions 16 to 30 belong to the technological dimension and were questions with multiple response alternatives. The questionnaire was programmed using the Google Forms application. An official letter was sent to UGEL, Chiclayo, Peru, for information collection. This institution then called a working meeting with the research team to finalize some details related to ethical procedures before distributing the

questionnaire. From this meeting, authorization was obtained from the Director of UGEL, Chiclayo-Peru, to apply the questionnaire; Such authorization is legitimized in Official Letter No. 007742-2020-GR.LAMB / GRED-UGEL.CHIC. Then, from the direction of the UGEL, Chiclayo-Peru, the form was sent to the pertinent educational institutions, whose directors served as support for the socialization of the questionnaire. Some managers sent the questionnaire directly to their teachers, others provided the team of researchers with how to contact the participating teachers. To convince the participants to be part of the study, a letter was sent to their emails that explained in detail the importance of the study to improve the pedagogical use of ICT in teachers of the Local Educational Management Unit, Chiclayo-Peru, 2020.

2.4. Analysis of data

The data processing was carried out using the modified Lawshe model (Tristán-López, 2008), then it was applied to the teachers who met the inclusion criteria for the pilot test via Google Form; the collected data was processed through the software SPSS, V.25. Cronbach's alpha coefficient was used to determine reliability (Fernández Cruz et al., 2018). The questionnaire was also subjected to content validation using the modified Lawshe model, with the content validity index of the entire instrument being 96% acceptance; Cronbach's Alpha was used for reliability, the value being 0.756 for the instrument, following Nunnally (1978) the minimum acceptable score was 0.70, and the maximum value was 1 (Castillo-Sierra et al., 2018).

2.5. Ethical considerations

The Declaration of Helsinki (World Medical Association Declaration of Helsinki, 2013) was taken into account, among which the principles of autonomy are considered because teachers have had the freedom to decide to participate or not in the research; justice deals with the right of the participants to benefit from the results of the investigation; of beneficence and non-maleficence, principles referring to the goodness that researchers have in maximizing benefits and reducing harm (Siurana Aparisi, 2010; Moscoso Loaiza & Díaz Heredia, 2017). The institution's ethics committee that supports this study carried out a rigorous evaluation of the legal, ethical, and methodological aspects, guaranteeing that the investigative process does not affect the rights of the human beings who participate in the investigation and contribute to the advancement of the investigation. science and humanity (Martín-Arribas et al., 2012).

3. RESULTS

Table 1 shows that 92.1% of teachers always plan their learning sessions using the distance education strategy "I learn at home"; 84.0% always carry out their learning activities using ICT as fundamental support within the educational process; 78.5% mention that they continuously develop conceptual content with the use of ICTs; 67.9% of teachers responded that ICTs help develops students' abilities; 54.4%, that ICT always allows students to express their ideas, opinions and value judgments; 74.5% always use ICT to organize academic information; 54.3% always use different ICT tools; 63.4% always use ICT tools, changing them with didactic strategies; 65.9% always prepare educational materials taking advantage of ICTs; 62.7% always use ICT to organize teamwork; 86.3% always contextualize the material provided by the Ministry of Education with the socio-educational context. About the feedback of the students who use the radio, 29.5% always responded and 36.8% sometimes; 73.3% assure that they always use the TV, while 60.2% assure that they always use the web for feedback issues. Regarding their predisposition to continue with virtual Education, 51.3% favor it.

Table 1

Pedagogical utility of ICT

Nº	Items	Evaluation Category	Total	%
1	You respect the planning of the "I learn at home" strategy	Always	800	92.1
		Sometimes	66	7.6

		Never	3	0.3
		Always	730	84.0
2	You develop their learning activities using ICT	Sometimes	133	15.3
		Never	6	0.7
		Always	682	78.5
3	You develop conceptual content using ICT	Sometimes	175	20.1
		Never	12	1.4
		Always	590	67.9
4	ICTs help develop students' abilities	Sometimes	273	31.4
		Never	6	0.7
		Always	473	54.4
5	Students express their ideas, opinions, and value judgments using ICT	Sometimes	373	42.9
		Never	23	2.6
		Always	647	74.5
6	You use ICT to organize information with students	Sometimes	206	23.7
		Never	16	1.8
		Always	472	54.3
7	You use different ICT tools with students	Sometimes	375	43.2
		Never	22	2.5
		Always	551	63.4
8	Didactically use ICT tools with students	Sometimes	299	34.4
		Never	19	2.2
		Always	573	65.9
9	You prepare educational materials using ICT tools	Sometimes	286	32.9
		Never	10	1.2
		Always	545	62.7
10	Use ICT tools to organize teamwork	Sometimes	290	33.4
		Never	34	3.9
		Always	750	86.3
11	You contextualize the material of the Ministry of Education to the reality of the students	Sometimes	117	13.5
		Never	2	.2
		Always	256	29.5
12	You give feedback to students who use the radio	Sometimes	320	36.8
		Never	293	33.7
		Always	637	73.3
13	You give feedback to students who use television	Sometimes	187	21.5
		Never	45	5.2
		Always	523	60.2
14	You give feedback to students who use the web	Sometimes	166	19.1
		Never	180	20.7
		Always	353	40.6
15	Would you agree to continue with distance education	Sometimes	446	51.3
		Never	70	8.1

Table 2 shows that the leading technological equipment used by the participating teachers to work on the distance education strategy "I learn at home" were smartphones 310 (35.67%), laptops 289 (33.26%), and desktop computers 225 (25.89%). The use of other devices, such as tablets and low-end phones, was below 3%. Regarding the type of Internet they used, 481 teachers (55.35%) connected through Wi-Fi, and 326 (37.51%) used personal data plans. The percentage of teachers who had to share the Internet with other family members was 6.79%, and only 0.35% of teachers used subsidized Wi-Fi services. Related to the sources of information used to contextualize the materials of the Ministry of Education, 355 (40.85%) of the teachers were helped by materials provided on websites in their academic area, 333 (38.32%) were supported by videos published on YouTube and 169 (19.45%) in digital books available on the Internet. Only 0.69% of teachers sought support from scientific articles. In item 19, the essential source to search for academic information in your area was Google 831 (95.63%); however, more recommendable sites, such as Google Scholar and other high-impact scientific databases, received scores below 1% due to the lack of training and initial induction on

the subject. Of the total, 311 (35.79%) teachers produced videos, 273 (31.42%) audio, and 235 (27.04%) slides, these being the primary multimedia materials produced by the participants.

Table 2

Use of ICT according to gender and employment status

Nº	Items	Evaluation Category	Gender		Total	%
			Female	Male		
			Labor Condition			
16	What technological equipment do you use to work on the "I learn at home" educational strategy?	Smartphone	248	62	310	35.67
		Laptop	250	39	289	33.26
		Desktop	160	65	225	25.89
17	The Internet you use is:	Home Wi-Fi	400	81	481	55.35
		Personal mobile data plan	243	83	326	37.51
18	What sources of information do you use to contextualize the material from the Ministry of Education?	Websites of your academic area	297	58	355	40.85
		YouTube videos	275	58	333	38.32
		Internet digital books	114	55	169	19.45
19	To access/search for academic information in your area, you use:	Google	659	172	831	95.63
20	What multimedia materials do you produce?	Videos	292	19	311	35.79
		Audio	212	61	273	31.42
		Slideshow	159	76	235	27.04
21	What software, program, or application do you use to produce educational materials?	YouTube	384	115	499	57.42
		Filmora	115	4	119	13.69
22	Do you receive the support of another person to prepare your digital materials?	Sons	244	44	288	33.14
		Teachers from the same area	120	62	182	20.94
		Head of the pedagogical innovation classroom	79	38	117	13.46
23	Do you use any software for collaborative work?	Google Drive	562	155	717	82.51
24	Where do you look for tutorials that allow you to learn other software?	Google	556	143	699	80.44
		YouTube	133	31	164	18.87
25	What medium do you use to communicate with students?	WhatsApp	690	173	863	99.31
26	When students do not have Internet, what means of communication do you use?	Llamadas telefónicas	676	165	841	96.78
27	What means do you use to receive academic evidence from students?	WhatsApp	632	138	770	88.61
		Mail	58	34	92	10.59
28	What video conferencing platforms do you use to communicate with students (for teaching)?	Zoom	77	19	96	11.05
		Google Meet	120	40	160	18.41
		Other (please specify	490	118	608	69.97
29	What virtual platforms do you use to send and receive student evidence?	Classroom	205	56	261	30.03
		Other (please specify	451	107	558	64.21
30		In Word	286	89	375	43.15

How do you present educational materials to students?	On video	249	54	303	34.87
	In PowerPoint slides	112	19	131	15.07

For the production of educational materials, 499 (57.42%) participants preferred YouTube, and 119 (13.69%) used Filmora. Those who leaned toward platforms like Audacity, Duolingo, and Jamboard did not even reach 7.5%. Of the total, 288 (33.14%) indicate that they received support from their children to develop their digital materials, 182 (20.94%) from teachers in the same area, and 117 (13.46%) indicate that they received support from the person in charge of the pedagogical innovation classroom. On the other hand, 717 (82.51%) indicated that the Google Drive application was the fundamental support to promote collaborative work in the classroom. Apps like Draw.io, Mindmup, Cmaptools, and others got shallow scores. In item 24, they indicate that 699 (80.44%) searched for tutorials on Google, and 164 (18.87%) on YouTube to learn how to handle more complex software. With very little relevance for the participants, applications such as Vimeo and Blogger appear. Of the total sample, 863 (99.31%) indicated using WhatsApp to communicate with students. Applications such as Facebook, Messenger, Telegram, or email presented irrelevant scores. According to these data, 841 (96.78%) of the participants indicate that when students do not have the Internet, they use the telephone to maintain communication. Other options, such as text messages, going to the student's house, or sending messages to third parties, presented very little relevance.

Item 27 indicates that the essential means to receive evidence of student learning were WhatsApp, with 770 (88.61%) of teachers, and email, with 92 (10.59%). Other options, such as Messenger, Classroom, or Telegram, presented irrelevant scores. According to the data, 160 (18.41%) of the participants use Google Meet for the development of teaching; while 96 (11.05%) use Zoom; the "Others" option presented 608 (69.97%), which means that many teachers, due to lack of knowledge, confuse videoconferencing platforms with other technological tools; Applications such as Jitsi Meet, Microsoft Teams, Messenger Rooms, and others, presented scores of very little relevance. Of the participants, 261 (30.03%) use Classroom to upload and receive evidence of student learning. Other platforms and applications, such as Moodle, Edmodo, Claroline, and Dokeos, presented scores of very little relevance. Finally, regarding how they present educational materials to students, 375 (43.15%) teachers answered that they send Word documents, 303 (34.87%) through videos, and 131 (15.07%) through slides. Options such as manual elaboration, audio, and others received shallow scores.

Table 3

Relationship between the level of pedagogical use of ICT, gender, IE location, and employment status

		Mean	S_x	K independent groups		
				Statistic	p	Effect size
Gender	**Female**	21.060	3.956	73182	0.205	0.059
	Male	20.876	4.568			
Location of the IE	**Urban**	20.961	4.020	89085	0.658	-0.018
	Rural	21.145	4.241			
Labor condition	**Designate**	20.913	4.040	80468	0.192	-0.055
	Contracted	21.284	4.211			

Table 3 shows the results obtained in the group of women (n=692) and men (n=177). Although both groups are homoscedastic (Levene's test: F=0.766; p.=0.382), applying the normality test we observe that both groups are generally not distributed in the variable pedagogical use of ICT, using the Shapiro- Wilk (W(women)=0.950, p=<0.001 and W(men)=0.864, p=<0.001). Therefore, the previous assumptions are not fulfilled, and we apply the non-parametric Mann-Whitney U test in this case. Observing the results of the hypothesis contrast, it is concluded that there are no significant differences in the means (p> 0.05). Teachers of both sexes do not have significant differences in the pedagogical use of ICT in the "I learn at home" strategy.

Regarding the urban or rural location of the educational institutions, the results obtained in the group of teachers from the urban area (n=585) and the rural area (n=284), even though both groups are homoscedastic (Test Levene: F=0.279; p=0.598), applying the normality test, we observe that both groups are generally not

distributed in the variable pedagogical use of ICT, using the Shapiro-Wilk test (W(urban)=0.941, p=<0.001 and W(rural)=0.909, p=<0.001). Therefore, the previous assumptions are not fulfilled, and in this case, the non-parametric Mann-Whitney U test is applied. Observing the results of the hypothesis contrast, there are no significant differences in the means (p> 0.05). Teachers in urban and rural areas do not have significant differences in the pedagogical use of ICT.

In the same way, in the groups by gender and location of the educational institution, in the labor condition, it is observed that there are no significant differences in the pedagogical use of ICT in the "I learn at home" strategy.

Figure 1

Scheme Q-Q normality test

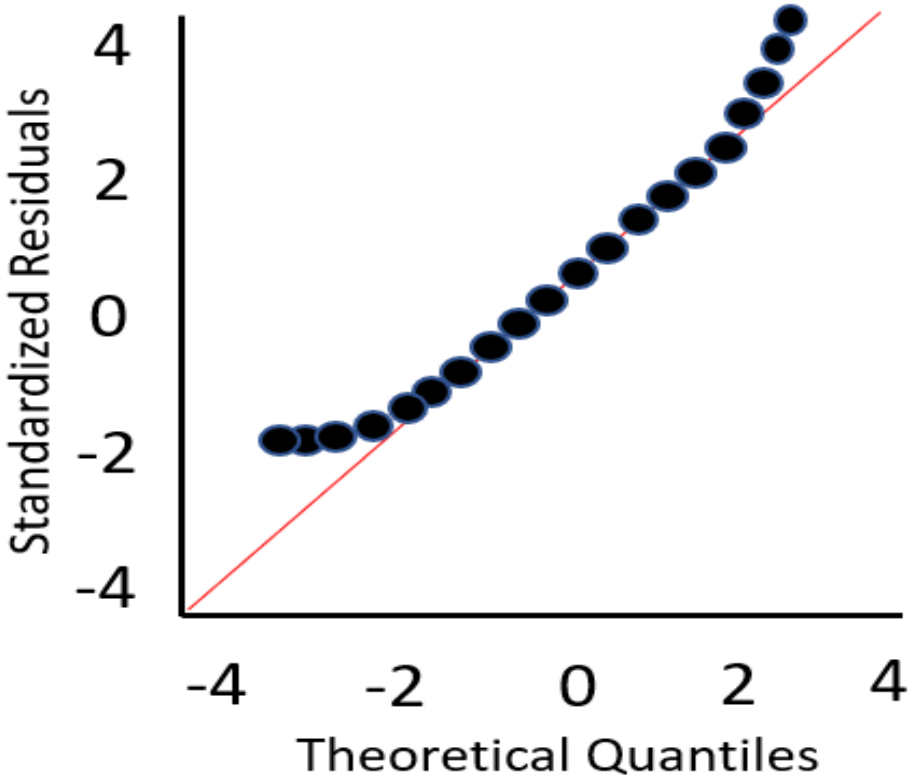

Figure Q-Q shows that it complies with the normality conditions, for which a non-parametric contrast is applied (Kruskal-Wallis test). The results indicate that there are significant differences between educational levels and the pedagogical use of ICT in the "I learn at home" strategy (p= <0.001 Kruskal-Wallis Test), with a moderate effect size (n^2 = 0.039).

Table 4

Relationship between level of pedagogical use of ICT, educational level

		Mean	S_x	K independent groups		
				Statistic	p	n^2
Education level	Initial	21.600	4.235	32.580	<0.001	0.039
	Primary	19.863	3.206			
	Secondary	21.577	4.476			

The posthoc test was applied to verify which groups the differences are found. Significant differences are observed in the pedagogical management of ICT in the "I learn at home" strategy between primary level

teachers with the initial level and between secondary and primary level teachers, in both cases with moderate effect sizes.

Table 5

Post-hoc tests (Tukey)

	Mean difference	t	Sig	d
Initial – Primary	1.737	5.316	<0.001	0.462
Initial – Secondary	0.023	0.071	0.997	0.005
Primary – Secondary	-1.714	-5.246	<0.001	0.440

Table 5 shows that initial education teachers have a better pedagogical use of ICT than those at the primary level and teachers at the secondary level do better than the primary level. It is also observed that the primary level has been significantly relegated in the pedagogical use of ICT in the distance education strategy "I learn at home."

4. DISCUSSION

This research aimed to identify and evaluate the pedagogical use of ICT in teachers of the UGEL, Chiclayo-Peru, to develop the "I learn at home" strategy. The research hypothesis maintains that there is a medium level in the pedagogical use of ICT in teachers of the UGEL, Chiclayo-Peru, to develop the distance education strategy "I learn at home." All the data processing and the contrast with previous studies allow us to maintain that the research hypothesis is fulfilled.

A total of 74.5% of teachers reported using ICT in a didactic manner to organize information with students and to develop and contextualize educational materials based on students' realities (Table 1). This finding reinforces the argument that teachers must integrate technological tools into their pedagogical practices to foster meaningful learning experiences (Hernández, 2017; Rubach et al., 2023) through innovative, creative, and engaging methods (Vértiz-Osores et al., 2019; Gerick & Killus, 2024). Additionally, teachers provide feedback to students who engage with classes via different platforms, including Radio (29.5%), Television (73.3%), and the Web (60.2%) (Table 1). This feedback process encourages both individual and group reflection, helping students identify their strengths and weaknesses to achieve their learning goals while also ensuring that instructional content aligns with their capacities (Rodriguez Aramendiz & Gallardo Córdova, 2019). However, the majority of teachers expressed dissatisfaction with the continuity of distance education (Table 1), citing challenges such as insufficient training in technological tools, limited internet access, and outdated technological equipment (Murillo & Duk, 2020). These barriers highlight the urgent need for improved infrastructure, digital literacy training, and policy interventions to enhance the effectiveness of technology-based education.

The pedagogical use of ICT in the distance education strategy "I learn at home" is shallow according to age and employment status (figure 1) because teachers are not adequately prepared to use technological tools for didactic purposes. In this sense, teachers must be permanently trained to acquire and master digital tools and have an ideal performance with today's educational needs (Peciuliauskiene et al., 2022; Levano Francia et al., 2019; Lv et al., 2024). Likewise, it is emphasized that teaching will be ineffective if the teacher does not learn to handle ICT as a highly relevant teaching resource (Varela-Ordorica & Valenzuela-González, 2020); for this, it must be based on didactic and pedagogical criteria with ethical and moral awareness (Martínez-Garcés & Garcés-Fuenmayor, 2020). The deficiencies found in the use of ICT in the distance education strategy "I learn at home, in the participants, are further evidence for the Peruvian State, through the Ministry of Education, to implement teacher training processes (Rivera et al., 2018), to face the second year of distance education 2021 and the commitment that higher education institutions must assume by training through ICT (Fajardo Pascagaza & Cervantes Estrada, 2020).

A high percentage of teachers use their internet data to guarantee the state educational process, therefore, when the quality of the teaching process is affected by problems of connectivity or internet speed, the teacher should not be held responsible for it. However, the data found agree that teachers who use their data have

better learning results than those who do not (Fajardo Pascagaza & Cervantes Estrada, 2020). In this sense, improving the Internet connection would help increase the teachers' performance and the quality of the process (Varela-Ordorica & Valenzuela-González, 2020; Almenara & Cejudo, 2020). The most used technological equipment during the educational process is smartphones and laptops. To contextualize the Ministry of Education material, teachers use YouTube and Google videos to access sources of information in the area they develop; they produce multimedia videos and audio material for students. This aspect is one of the weakest skills because it presents many difficulties in editing existing digital material; these difficulties become more acute when they try to generate unpublished audiovisual material (Martínez-Garcés & Garcés-Fuenmayor, 2020). The preferred application was YouTube (table 2); through YouTube, teachers can freely access numerous videos and educational tutorials that allow students to learn autonomously (Fajardo Pascagaza & Cervantes Estrada, 2020). Another essential element is that many teachers request support from their children and consult Google tutorials to learn how to do efficient searches; WhatsApp is the most important means they have used to communicate and receive evidence from students according to what they say; this application favors permanent, direct communication and allows sharing resources between teachers and students (Rodríguez Valerio, 2020; Gómez-Castells et al., 2021). The most used video conference platforms are Google Meet and Zoom; the virtual platform he has used is the classroom; however, teachers require more training for professional use. The preferred application for collaborative work is Google Drive, which is used as a teaching and communication resource and information exchange between students and teachers (Arancibia et al., 2020).

Teachers use their technological equipment (table 2) to connect with students during distance education; many of them have produced multimedia materials using YouTube, Audacity, and other software because they favor teaching-learning activities (Maraza-Quispe et al., 2020); these materials are sent to students through WhatsApp, text messages, email or other means. Teachers disagree with distance education's continuity because connectivity problems commonly ruin all effort and didactic preparation. Likewise, due to their poor command of ICT, in the most extreme cases, many of them have had to turn to their families and co-workers to learn how to use technological tools didactically.

5. CONCLUSIONS

There are no significant differences in the pedagogical management of ICT for the development of the distance education strategy "I learn at home" between male and female teachers from rural and urban areas or contractual modalities; however, there are significant differences between educational levels, with the differences between pre-school and primary level in favor of the former and between primary and secondary in favor of the latter. The common problem is that teachers have had to use personal technological and economic resources such as mid-range and high-end equipment, internet plans to have better connectivity, and energy consumption to ensure that the educational teaching process does not stop.

Teachers who usually develop learning activities using ICTs encourage the development of conceptual content, skills, and attitudes of critical judgment in students; Likewise, within the "I learn at home" strategy, information has been organized in a didactic way, preparing educational material, contextualizing the teaching material of the Ministry of Education to the reality of the students, training feedback has been given to the students who have made use of radio, television and the web, through a pedagogical and didactic use of ICT, respecting the guidelines issued by the Ministry of Education for times of pandemic.

The limited support from authorities within agencies affiliated with the Ministry of Education in Peru initially hindered the implementation phase of the questionnaire. To address this challenge, coordination efforts were undertaken with the representative of the Chiclayo-Peru Directors' Association to facilitate and expedite the survey administration process among teachers.

Conflict of Interest: The authors declare no conflict of interest.

Ethical Approval: The study adheres to the ethical guidelines for conducting research.

Enaidy, E. (2025). The role of ICT in developing Peru's 'I learn at home' distance education strategy. *Contemporary Educational Research Journal*. *Contemporary Educational Research Journal*, *15*(1), 45-57. https://doi.org/10.18844/cerj.v15i1.9630

Funding: This research received no external funding.

REFERENCES

Alcivar, C., Vargas, V., Calderon, J., Triviño, C., Santillan, S., Soria, R., & Cardenas, L. (2019). El uso de las TIC en el proceso de enseñanza-aprendizaje de los docentes en las Universidades del Ecuador. *Revista Espacios*, *40*(02). http://ww.revistaespacios.com/a19v40n02/19400227.html

Almenara, J. C., & Cejudo, C. L. (2020). The adoption of technologies by the elderly: Contributions from the TAM model (Technology Acceptance model). *Publicaciones de la Facultad de Educacion y Humanidades del Campus de Melilla*, *50*(1), 141-157.

Arancibia, M. L., Cabero, J., & Marín, V. (2020). Beliefs on teaching and the use of information and communication technologies (ICT) by higher education professors. *Formacion Universitaria, 13*(3), 89–100. https://doi.org/10.4067/S0718-50062020000300089

Becerra Ortiz, J. A. (2016). The relationship of responsibility between the state and telecommunications service providers. *Prolegomena* , *19*(37), 57-66. http://www.scielo.org.co/scielo.php?pid=S0121-182X2016000100004&script=sci_arttext

Castillo-Sierra, D. M., González-Consuegra, R. V., & Olaya-Sánchez, A. (2018). Validity and reliability of the Spanish version of the Florida Patient Acceptance Survey. *Revista Colombiana de Cardiologia*, *25*(2), 131-137. http://www.scielo.org.co/scielo.php?pid=S0120-56332018000200131&script=sci_abstract&tlng=en

Colas Bravo, M. P., de Pablos Pons, J., & Ballesta Pagan, J. (2018). The impact of ICT on Teaching in the Spanish Education System: A literature review. *RED-REVISTA DE EDUCACION A DISTANCIA*, (56).

Fajardo Pascagaza, E., & Cervantes Estrada, L. C. (2020). Modernization of virtual education and its incidence in the context of Information and Communication Technologies (ICT). https://repository.unimilitar.edu.co/handle/10654/42487

Fernández Cruz, F. J., Fernández Díaz, M. J., & Rodríguez Mantilla, J. M. (2018). El proceso de integración y uso pedagógico de las TIC en los centros educativos madrileños. https://docta.ucm.es/entities/publication/9adcdf7a-e27d-4ff0-b39d-57a06ca71ac5

Garcia Gonzalez, I., Peña-López, I., Johnson, L., Smith, R., Levine, A., & Haywood, K. (2010). Informe Horizon: edición iberoamericana 2010. https://openaccess.uoc.edu/handle/10609/2661

Gerick, J., & Killus, D. (2024). Tolerance of uncertainty and its role for teachers' use of ICT in classroom in times of digital transformation. *Zeitschrift für Bildungsforschung*, 1-18. https://link.springer.com/article/10.1007/s35834-024-00431-y

Ghitis Jaramillo, T., & Alba Vásquez, A. (2019). Perceptions of Future Teachers on the Use of Technology in Early Childhood Education. *Revista electrónica de investigación educativa*, *21*. https://www.scielo.org.mx/scielo.php?pid=S1607-40412019000100123&script=sci_abstract&tlng=en

Gómez-Castells, M. R., Venegas Álvarez, G. S., & Mena Vargas, N. P. (2021). Mensajería en Wasap y millennials universitarios de Cotopaxi, desafíos para la educación superior de Ecuador. *Actualidades Investigativas en Educación*, *21*(1), 29-57. https://www.scielo.sa.cr/scielo.php?script=sci_arttext&pid=S1409-47032021000100029

Guizado Osco, F., Menacho Vargas, I., & Salvatierra Melgar, A. (2019). Digital competence and professional development of teachers from two institutions of regular basic education of Los Olivos district, Lima-Peru. *Revista Cuatrimestral de Divulgación Científica, 6*(1), 54–70. https://doi.org/10.21503/hamu.v6i1.1574

Haarala-Muhonen, A., Myyry, L., Pyörälä, E., Kallunki, V., Anttila, H., Katajavuori, N., ... & Tuononen, T. (2023). The impact of pedagogical and ICT training in teachers' approaches to online teaching and use of digital tools. In *Frontiers in Education, 8,* 1223665. https://www.frontiersin.org/articles/10.3389/feduc.2023.1223665/full

Hernandez, RM (2017). Impact of ICT in education: Challenges and Perspectives. *Purposes and representations*, *5* (1), 325-347. https://dialnet.unirioja.es/servlet/articulo?codigo=5904762

Enaidy, E. (2025). The role of ICT in developing Peru's 'I learn at home' distance education strategy. *Contemporary Educational Research Journal*. *Contemporary Educational Research Journal*, *15*(1), 45-57. https://doi.org/10.18844/cerj.v15i1.9630

Levano-Francia, L., Sanchez Diaz, S., Guillén-Aparicio, P., Tello-Cabello, S., Herrera-Paico, N., & Collantes-Inga, Z. (2019). Digital Competences and Education. *Journal of Educational Psychology-Propositos y Representaciones*, *7*(2), 579-588. https://eric.ed.gov/?id=EJ1220548

Lv, B., Zhou, D., Rong, Z., Tian, X., & Wang, J. (2024). Effects of professional development program on primary science teachers' ICT use in China: mediation effects of science teachers' knowledge, beliefs and instructional practice. *Disciplinary and Interdisciplinary Science Education Research*, *6*(1), 11. https://link.springer.com/article/10.1186/s43031-024-00099-4

Maraza-Quispe, B., Alejandro-Oviedo, O., Fernández-Gambarini, W., Cisneros-Chavez, B., & Choquehuanca-Quispe, W. (2020). Análisis de YouTube como herramienta de investigación documental en estudiantes de educación superior. *Publicaciones*, *50*(2), 133-147. https://revistaseug.ugr.es/index.php/publicaciones/article/view/13949

Martín-Arribas, M. C., Rodríguez-Lozano, I., & Arias-Díaz, J. (2012). Revisión ética de proyectos. Experiencia de un comité de ética de la investigación. *Revista Española de Cardiología*, *65*(6), 525-529. https://www.sciencedirect.com/science/article/pii/S0300893212000887

Martínez-Garcés, J., & Garcés-Fuenmayor, J. (2020). Digital teaching skills and the challenge posed by virtual education as a result of COVID-19. Educación y Humanismo, 22(39), 1–16. https://doi.org/10.17081/eduhum.22.39.4114

MINEDU. (2020). *Diario Oficial El Peruano*. Resolución Ministerial N° 160-2020-MINEDU.

MINEDU. (2021, August 6). *Aprendo en casa.* https://www.gob.pe/institucion/munirazuri/campañas/3779-aprendo-en-casa

Moscoso Loaiza, LF, & Díaz Heredia, LP (2018). Ethical aspects in qualitative research with children. *Latin American Journal of Bioethics*, *18* (1), 51-67. http://www.scielo.org.co/scielo.php?pid=s1657-47022018000100051&script=sci_arttext

Murillo, F. J., & Duk, C. (2020). The COVID-19 and the Educational Gaps. *Revista latinoamericana de educación inclusiva*, *14*(1), 11-13.

Nunnally, J. C. (1978). An overview of psychological measurement. *Clinical diagnosis of mental disorders: A handbook*, 97-146. https://link.springer.com/content/pdf/10.1007/978-1-4684-2490-4_4?pdf=chapter%20toc

Palomo, E. (2018). *El reto de los profesores de América Latina: pasar del cuaderno a las 'apps.'* https://elpais.com/internacional/2018/03/22/america/1521738265_438491.html

Peciuliauskiene, P., Tamoliune, G., & Trepule, E. (2022). Exploring the roles of information search and information evaluation literacy and pre-service teachers' ICT self-efficacy in teaching. *International journal of educational technology in higher education*, *19*(1), 33. https://link.springer.com/article/10.1186/s41239-022-00339-5

Peláez, A. (2019). *La tecnología no termina de aterrizar en los centros educativos del país*. El Espectador. https://www.elespectador.com/educacion/la-tecnologia-no-termina-de-aterrizar-en-los-centros-educativos-del-pais-article-882679/

Prado, E. (2020). *Ministro Benavides expone experiencias de 'Aprendo en casa' en encuentro latinoamericano*. La República. https://larepublica.pe/politica/2020/06/30/ministro-benavides-expone-experiencias-de-aprendo-en-casa-en-encuentro-latinoamericano/

Rivera, P., Lindín, C., Celdrán, M., & Gracia, M. (2018). Tecnologías digitales para transformar la sociedad.

Rodriguez Aramendiz, V. R., & Gallardo Córdova, K. E. (2019). Decisions in evaluation: virtual postgraduate environments, ex post-facto study. RevistadeEducaciónaDistancia, 59, 2–19. https://doi.org/10.6018/red/59/06

Rodríguez Valerio, D. (2020). Beyond instant messaging: WhatsApp as a mediation and support tool in the teaching of Library Science. *Información, Cultura y Sociedad*, *42*, 107–126. https://doi.org/https://doi.org/10.34096/ics.i42.7391

Rubach, C., Quast, J., Porsch, R., & Arndt, M. (2023). Exploring the link between basic ICT competence beliefs and technology use for student teachers and teachers: A use of bifactor exploratory structural

Enaidy, E. (2025). The role of ICT in developing Peru's 'I learn at home' distance education strategy. *Contemporary Educational Research Journal*. *Contemporary Educational Research Journal*, *15*(1), 45-57. https://doi.org/10.18844/cerj.v15i1.9630

equation models. *Unterrichtswissenschaft*, *51*(4), 533-557. https://link.springer.com/article/10.1007/s42010-023-00188-9

Sánchez, B. (2018). *Digitalizar la escuela, sí, ¿pero para qué?* El País.

Siurana Aparisi, J. C. (2010). The principles of bioethics and the growth of an intercultural bioethics. *Veritas*, *22*(22), 121-157.

Tristán-López, A. (2008). Modificación al modelo de Lawshe para el dictamen cuantitativo de la validez de contenido de un instrumento objetivo. *Avances en medición*, *6*(1), 37-48. https://dialnet.unirioja.es/servlet/articulo?codigo=2981185

UNESCO. (2020). *Responding to COVID-19: Education in Latin America and the Caribbean*. UNESCO. https://en.unesco.org/fieldoffice/santiago/covid-19-education-alc

UNICEF. (2020, August 6). *Regresar a la escuela en época de pandemia.* UNICEF.

Vandeyar, T., & Adegoke, O. O. (2024). Teachers' ICT in pedagogy: A case for mentoring and mirrored practice. *Education and Information Technologies*, *29*(14), 18985-19004. https://link.springer.com/article/10.1007/s10639-024-12603-4

Varela-Ordorica, S. A., & Valenzuela-González, J. R. (2020). Use of information and communication technologies as a transversal competence in teacher training. *Revista Electronica Educare*, *24*(1), 172–191. https://doi.org/10.15359/ree.24-1.10

Vega-Gea, E., Calmaestra, J., & Ortega-Ruiz, R. (2021). Percepción docente del uso de TIC en la Educación Inclusiva:[Teacher perception on the use of ICT in inclusive Education]. *Pixel-Bit. Revista de Medios y Educación*, *62*, 235-268. https://recyt.fecyt.es/index.php/pixel/article/view/90323

Vértiz-Osores, R. I., Pérez-Saavedra, S., Faustino-Sánchez, M. Á., Vértiz-Osores, J. J., & Alain, L. (2019). Information and Communication Technology in Primary School Students within the Framework of Inclusive Education at a Special Basic Education Center. *Journal of Educational Psychology-Propositos y Representaciones*, *7*(1), 157-164. https://eric.ed.gov/?id=EJ1212510

World Medical Association Declaration of Helsinki. (2013). Ethical Principles for Medical Research Involving Human Subjects. *Clinical Review & Education*, *310*(20), 2191–2194. https://www.wma.net/wp-content/uploads/2016/11/DoH-Oct2013-JAMA.pdf