Digital Competence And Intercultural Praxis Of Rural Secondary Education Teachers

Jesús Vilchez Guizado[1], Julia Ángela Ramón Ortiz[2], Victor Enrique Cabrera Abanto[3]

[1]National University Hermilio Valdizán, Huanuco, Peru
Email: jvilchez@unheval.edu.pe,
ORCID: https://orcid.org/0000-0002-5962-8703
[2] University of Huanuco, Huanuco, Peru.
Email: julia.ramon@udh.edu.pe,
ORCID: https://orcid.org/0000-0003-4532-1476
[3]National University Hermilio Valdizán, Huanuco, Peru
Email: vcabrera@unheval.edu.pe,
ORCID: https://orcid.org/0000-0002-5721-9172

ABSTRACT

In the multicultural and interconnected society, digital technology has become an essential pedagogical tool for teachers in rural areas, whose fundamental task is to integrate digital technology into the educational context. This study analyzes and evaluates the self-perception of teachers about their digital competence and the relationship with their performance in the intercultural environment of rural secondary education. The research approach was quantitative, non-experimental descriptive-correlational design, with a sample of 192 rural secondary education teachers from Huánuco-Peru, using the survey technique through the questionnaire instrument, validated by expert judgment. The results indicate that the digital competence and intercultural vision of teachers in rural areas is direct, on average more than 58% assume to have developed their digital competence at a high or very high level, while more than 71% have a positive perception about intercultural education; the Spearman correlation coefficient between the two variables is 0.75. It is concluded that there is a direct and complementary relationship between the development of digital competence and the interculturality of teachers, which leads to an efficient management of the teaching-learning process.

Keywords: digital technology; intercultural education; digital content, multiculturalism; digital competence.

INTRODUCTION

At the beginning of the third decade of the twenty-first century, education has undergone a process of transformation in the global context; also abrupt transformations such as those caused by the pandemic generated by COVID-19; which has forced the use of the internet and social networks in all activities of people, both individual and group, with emphasis on the educational process. Posing new demands, demands and challenges to the pedagogical field, immersed in a postmodern and multicultural society that aspires to the construction of interculturality in the social, and digiculturality in the cultural and virtual (Leiva & Priegue, 2012).

Currently, many teachers still do not understand the usefulness that the use of digital technology can have in the development of the student training process; therefore, many show reluctant attitudes to its use, since they seem to understand that information and communication technologies (ICT) are a distraction or a threat to the smooth running of classes (Rodríguez-García et al., 2019). ICTs led to the change of focus in the realization of educational activities, from those focused on teacher teaching, to new methodologies based on a significant learning process, associated with higher levels of information understanding (Contreras et al., 2013; Eleizalde et al. , 2010).

The issue of digital competences of teachers is a current and future task, its importance is increasingly increasing, and when it is integrated into the environment of interculturality, it shows greater relevance and importance. In this orientation, educational and methodological approaches are appropriate to adapt them to the changing social reality, through the incorporation of the elements of ICT, which enable the implementation of new didactic practices that dynamize and motivate teaching and learning processes (López & Ortiz, 2018).

The educational process is evoked to seek innovative pedagogical models that facilitate more meaningful, active, participatory and effective learning (Barreiro, 2018; Torrecilla, 2018). In this line, the use of digital technology in the teaching-learning process is plausible, through learning strategies in the context of virtuality such as collaborative work, flipped class and project-based learning; that contribute to the integral formation of students. Hence the relevance of the integration in teaching of programmatic contents and teaching strategies mediated by digital technology to

ensure the development of competencies in students (Marcelo et al., 2016).

According to Cedeño (2019) and Soto-Villegas (2018), the new social and educational scenario requires the combination and integration of digital technology and local culture, in correspondence to the training demands demanded by the current reality. Opening a range of possibilities for the use of ICT for the development of interculturality, as a model of carrying out an inclusive and networked education, where digital skills, technological resources and interculturality converge harmoniously in inclusive, interconnected and networked educational spaces. The integration of digital technology into education requires relevant interventions in the teaching-learning process, which must prioritize not only the acquisition of knowledge based on digital resources, but also support the process of appropriation of this knowledge by the student (Marcelo et al., 2016).

Digital competence

Digital competence encompasses the body of knowledge, which is used in digital technologies to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build effective, efficient, appropriate, critical, creative, autonomous, flexible, ethical, reflective knowledge for work, participation and learning (Guzmán-Simón et al., 2017). The development of digital competence, as one of the challenges of teachers in the digital age, involves the development of critical thinking, problem solving, communication, collaboration, creativity and innovation through knowledge of content and digital media; skills in the management of ICT, through information processing, The ability to create, evaluate and use information efficiently.

Digital competence is a complex learning process, which is also gradual and recurrent. This competence includes the ability to properly use digital tools and resources for the search, management, analysis of information in knowledge in a critical way (Perdomo et al., 2020). In this line, the digital competence of teachers is expressed in the ability to use media, resources and digital content in the design and implementation of learning activities, from the updating, selection and permanent evaluation for their integration into educational action. The development of digital competence is expressed in a gradient that begins with technological acceptance, continues with the management of

resources and content and, its highest level is the generation of digital information.

Technology acceptance

The first level of use of digital resources and content refers to the willingness to use technology to support a certain activity (Teo, 2008). At this level, technological acceptance is a category that needs to be studied from various dimensions; Since it begins with the expectation that one has regarding the use of a digital tool, through the approach to information and evidences the need to develop different digital skills.

Acceptance translates into a set in which perception, appreciation, and evolution are articulated, from which teachers can produce and reproduce their teaching practice (Regil, 2014). Technological acceptance is based on the motivation of mathematics teachers for the choice of digital technologies, which implies taking into account social and communicative factors; contexts and circumstances, modelling elements of teachers' performance in the context of virtual education.

Management of resources and digital content

A digital resource is any item that is in digital format and that can be viewed and stored on an electronic device. They are designed to obtain information on a topic, to enable the acquisition of knowledge, reinforce the achievement of learning, improve an unfavorable situation, strengthen the development of a certain competence and evaluate knowledge (García, 2010). On the other hand, as a learning tool, priority is given to the use of freely accessible resources, free or open to the public; which are teaching, learning or research materials that are in the public domain to access quality teaching materials through a virtuous circle of creation, improvement and adaptation of materials over time and in the most varied contexts, being used, adapted and distributed free of charge (UNESCO, 2020).

Digital content is made up of all the information that can be displayed in a digital medium, both on a web page, on social networks or on any other website. These contents can be in the form of text, image, video, maps, among others; being the fundamental thing that it has a quality content as one of the essential pillars to dynamize the teaching-learning activities. They also enable virtual training focused on different activities that

students must perform, and interaction with different learning objects (Cabero, 2015).

For an adequate management of digital resources and content, it is important to recognize that the level of their use involves a non-linear process in which a sequence of actions are linked, such as: search, detect, select, weight, classify, filter, compare, contextualize, interpret, take advantage of, use, give meanings, reflect, store and share (Regil, 2014).

Digital content creation

The creation of content and digital information means producing texts, articles, images, videos, audios, which offer information or entertainment and meet particular objectives of attracting web traffic and potential customers, in order to distribute them on various channels or platforms and attract the attention of users. In an ideal educational scenario, the experience of creating content collaboratively (teacher and students) in the classroom is essential to boost learning. Therefore, the creation of digital content and information in education enables the teacher's scaffolding to promote good practices for future production on the network (Castillejos, 2019). In this activity the teacher exploits his ability to integrate devices, content and digital resources in order to optimize the teaching-learning process; through the adaptation, management and organization of teaching strategies with the mediation of digital technology.

Interculturality

Interculturality is based on the equitable exchange between different cultures in conditions of equality in the same space and time, without one culture overlapping the other, creating relationships based on integration with a good climate of coexistence and harmony, through dialogue, mutual listening or collaboration and respect, Based on ethnic, religious, language or cultural criteria, this approach does not impose the superiority of one culture over another, but rather promotes equality, integration and understanding of different cultures.

Interculturality is an approach to contact and communication between cultures, in a respectful way, without one culture overlapping the other, creating relationships based on integration with a good climate of coexistence and harmony (Garrote et al., 2018). It fosters, negotiations, exchanges and development of culture from the interaction between people, knowledge and

culturally different practices; therefore, interculturality does not come by itself, since it has to be sought and built (MINEDU, 2005).

In the educational field, interculturality aims to build a more inclusive and egalitarian society, where teachers must position themselves before a way of assuming, organizing and guiding pedagogical actions aimed at managing the existence, in the same space and time, of cultural content, belonging to different cultures (Peiró & Merma, 2012). Promoting the realization of activities from a global perspective, using and developing for the common benefit, oriented to social construction, involving the student in a critical analysis of reality and development of action projects, which involves the search for equality.

A process of intercultural education is evoked to the integral formation of the student, combining the understanding of cultural diversity in society, the ability to communicate between people of different cultures, the creation of attitudes favorable to the diversity of cultures, and the increase of social interaction between culturally different people; taking into account diversity, equity and social cohesion (Peiró & Merma, 2012). Therefore, the praxis of intercultural education implies the approach of innovation strategies in order to produce changes in educational processes, to adapt them to the needs of students and the social demands of the moment.

In today's education, the integration of digital technology favors network cooperation from an intercultural perspective and the promotion of intercultural competences are fundamental elements to transform the training scenarios of a society in permanent change (Leiva & Priegue, 2012). Thus, the convergence of digital technology and knowledge of culture enables effective action in the teaching exercise in the socio-cultural context where the educational process is carried out, with the relevant integration of technology in line with the needs of the student. Being fundamental for this purpose some dimensions of educational interculturality, such as cultural dynamism, integration, empathy, flexibility and creativity.

The use of digital technology in its different manifestations enables a significant expansion of learning scenarios thanks to the various opportunities for communication and interrelation they offer for the achievement of an efficient education, according to the needs of the current moment, technological and intercultural, crossing the walls of the school to impregnate itself in the social and community spheres (Castañeda & Adell, 2013).

Currently, digital technology is the main ally of teachers to face the challenge of interculturality in face-to-face and virtual learning environments (Barreto & Tulia, 2013). Therefore, the role of digital technology in a process of educational innovation "are not only a means of information, knowledge and training experience, they are also forms of transformation of the processes themselves that are integrated into the competences to be acquired" (Pérez, 2013, p. 214). The supports provided by digital technology to educational activity significantly favor the development of intercultural competences and the structuring of networked cooperative activities (Santos et al., 2013).

From the above, the work presented seeks to answer the question: What is the level of digital competence of teachers and its relationship with their practice of interculturality in rural secondary education? The objective of the study is to analyze and evaluate the self-perception of teachers about their digital competence and the relationship with their performance in the intercultural environment, in rural secondary education. The same that is operationalized through the specific objectives:

- Know the level of digital acceptance and the intercultural approach of secondary education teachers in the context of rural education.
- Analyze the level of management of resources and digital content and the knowledge of the interculturality of secondary education teachers in rural areas.
- Identify the level of generation of digital content by teachers in the context of intercultural education in rural areas.
- Determine the relationship between digital competence and intercultural praxis of teachers of rural intercultural secondary education.

METHODOLOGY

Research design

The design used for the study is quantitative non-experimental cross-sectional and is considered descriptive-correlational (Hernández et al., 2014). The research was oriented to the description and analysis of the attitudes and perceptions of teachers about the development of their digital competence and the practice of intercultural education during their teaching action, as well as the relationship between them.

Participants

The study population is made up of 496 teachers between stable and temporary secondary education who work in rural institutions of the twelve districts of the province of Huánuco. The type of sampling used has been non-probabilistic, in its intentional modality with groups formed in advance (Creswell, 2014). The sample was composed of 192 secondary school teachers of both sexes, belonging to four areas of training: mathematics, communication, natural sciences and social sciences (Table 1). The number of teachers chosen as members of the sample is proportional to the population of teachers in each of the 12 rural districts of the province that make up the study population. For the fieldwork, the chosen professors were contacted by the researchers through the telephone number recorded in their work file, then visited to collect data. As criteria for inclusion of the subjects to the sample, three criteria were considered: (a) to be teaching in a rural secondary school, (b) to be using digital technology in their teaching activity, and (c) to have basic notions of interculturality and intercultural education.

Table 1. Distribution of the population and study sample by districts

N°	Rural district	Number of schools	Number of teachers	Study sample
1	Amaryllis	8	47	18
2	Chinchao	10	64	25
3	Churubamba	9	56	21
4	Margos	5	24	9
5	Pillcomarca	4	28	11
6	Kichki	7	46	18
7	San Fco. of Cayrán	4	36	14
8	San Pedro de Chaulán	4	32	12
9	Santa Maria del Valle	12	72	28
10	San Pablo de Pillao	4	30	12
11	Yacus	3	16	6
12	Yarumayo	7	45	18
	Total	66	496	192

Instruments

The instrument used to collect information is the questionnaire, both for the variable digital competence and interculturality with items of an evaluative nature. The first was a questionnaire of

"assessment of the digital competence of teachers" (table 2), whose objective was to investigate the level of digital competence of secondary education teachers, the items are presented as affirmations and were valued by the participants according to their own perception, through: very low (1), low (2), medium (3), high (4) and very high (5).

Table 2. Dimensions of the digital competence assessment questionnaire.

Dimension	Conceptual definition	Items
Digital acceptance	Referring to the incursion into the use of technology by teachers, based on the decision of how and when they use it for their activity.	4
Use of digital content	Referring to the use of existing content on the network such as texts, images, videos, maps ..., with the purpose of carrying out teaching.	4
Digital content generation	It is expressed in the production of texts, images, videos, audios, which offer information and meet educational objectives.	4
Information management	Acquisition of information from one or more sources, custody and distribution to students in its various manifestations	4

The second variable is intercultural praxis, where information is collected on the assessment of teachers during their teaching action (Table 3), through four response scales: deficient (1), fair (2), good (3) and very good (4).

Table 3. Dimensions of the intercultural education assessment questionnaire.

Dimension	Conceptual definition	Items
Cultural integration	Process by which teachers adapt to a new organization, and to the particular culture of the new context where they work.	4
Cultural dynamism	Know the cultural practices and beliefs of students as a dynamic phenomenon, which are strengthened from individual and group interaction.	4
Cultural empathy	Ability to share, negotiate and exchange cultural meanings by putting oneself culturally in place of another.	4
Creativity and cultural flexibility	Acquisition of knowledge and the development of attitudes and skills in different contexts, through cognitive strategies that encourage flexible and creative thinking.	4

The content validity of the questionnaires was carried out through the judgment of experts, who evaluated the correspondence of the

items with their respective grouping dimensions according to the criteria of clarity, relevance and univocity, of the processing of the information collected in the pilot test was obtained on average a validity coefficient of .856 and reliability of .825, both results considered as very good. The information collected by the questionnaire was complemented with other techniques, such as interviews and informal observations made to teachers, as well as literature reviews related to the topic.

Data collection and analysis procedure

For the collection of information, teachers working in educational institutions in rural districts of the province of Huánuco were contacted, who were informed of the research work and ethical criteria, which was concretized with the signing of the informed consent of the directors of the educational institutions taken as a sample. The application of the data collection instruments is carried out at the end of the second half of 2021. Prior to the administration of the questionnaire for the two variables under study, each respondent was explained the purpose of the study in the process of execution.

Descriptive statistics and non-parametric statistics were used for the analysis of the results. In the analysis of the quantitative information, corresponding to the questionnaire for the assessment of digital competence and interculturality, descriptive statistics were used, with presentation of results in tables and graphs, which allows comparing the percentage of teachers who valued the items corresponding to each dimension of the variables under study. Because the study variables are ordinal, the use of Spearman's Rho correlation was determined. Non-parametric statistics were applied to establish the correlation or influence between the dimensions of digital competence and the self-perception of intercultural education.

RESULTS

The results analyzed in this section come from the questionnaire administered to rural secondary education teachers, both for the variable digital competence (DC) and intercultural education (EI); The same ones that constitute an input to understand the relationship between the use of digital technology and interculturality in the context of rural education.

Results related to digital competence (DC)

The digital competence referred to the digital acceptance dimension in the context of virtual education, 47.2% of teachers have a high acceptance, while 30.6% accept digital technology at a medium level, 11.1% accept at a low level and only 8.3% have a very high level of acceptance. In the above, it can be noted that there is a level of acceptance of digital technology in teachers that is progressing progressively, strengthening their digital competence (table 4).

Table 4. Level of acceptance of digital technology - use of digital resources and content

Level	Acceptance of digital technology		Use of digital resources and content	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Very low	5	2.8%	8	4.2%
Low	21	11.1%	16	8.3%
Middle	59	30.6%	64	33.3%
High	91	47.2%	80	41.7%
Very high	16	8.3%	24	12.5%
Total	**192**	**100.0%**	**192**	**100.0%**

The teachers participating in the study regarding the use of digital resources and content for their teaching action during the implementation of virtual education; 41.7% of respondents consider that they have a high level of use of digital resources and content, while 33.3% use them at a medium level, and only 12.5% consider that their level of use is very high (see table 4). This result shows the almost widespread use of technology by secondary school teachers in their teaching activity.

Regarding the dimension generation of digital content for teaching action, 40.3% consider that it is done at a medium level, followed by 30.6% who consider it to be at a high level, and only 11.1% consider that their level of digital content production is very high (see table 5). This result shows some weaknesses of secondary school teachers to create or generate their own digital content to carry out their teaching-learning activities.

Table 5. Level of generation or creation of content and digital resources - management of content and digital information.

Level	Digital content generation		Content and digital information management	
	Frequency	**Percentage**	**Frequency**	**Percentage**

Very low	6	2.9%	11	5.73%
Low	29	15.3%	24	12.50%
Middle	77	40.3%	74	38.5%
High	59	30,6%	56	29.2%
Very high	21	11.1%	27	14.0%
Total	**192**	**100,0%**	192	100.00%

With regard to the management of digital content and information, in the context of virtual education, 38.5% of teachers consider that they do it only at a medium level, followed by 29.2% who say they do it at a high level, while 13.9% assume that they do it at a very high level (table 5). According to the result described, most teachers are in the process of evolution in the management of digital information, as they show weaknesses in the process of integrating digital technology in the teaching-learning process.

In summary, of the four results described referring to the development of digital competence of rural secondary education teachers, on average approximately represent more than 81.0% of the respondents, answered their performance in this competence, from their personal perspective as very high, high or medium; while the low and very low responses only reach 18.1%high, the same that indicates that there is a level of progressive empowerment in the use of digital technology in the development of classes in rural secondary education.

Results related to intercultural education (EI)

Regarding cultural dynamism, teachers who carry out their teaching activity in the intercultural context of rural areas, 56.6% of the participants consider interculturality as good, while 26.7% rate it as very good, 11.1% assume that it is regular and only 5.6% consider it as deficient. The results show that most teachers in rural secondary education have a positive self-perception exercising intercultural dynamism for teaching, Figure 1.

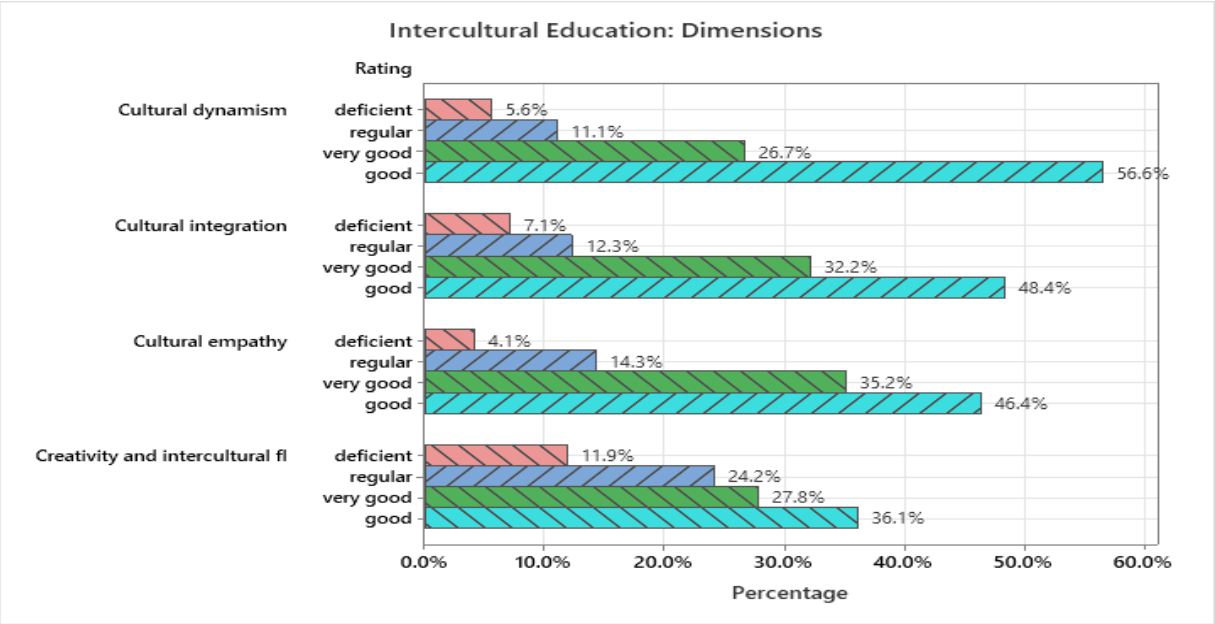

Figure 1. Qualification of the perception of intercultural education by dimensions.

For the cultural integration dimension, the majority of the teachers surveyed, representing 48.4% of the total, consider that cultural integration is good to carry out the educational process, while 32.2% assume it as very good, and only 19.4% consider it as fair or deficient. Thus, on average, more than 80.0% of respondents consider intercultural integration to be fundamental, which should prevail in the context of intercultural education (see figure 1).

For the cultural empathy dimension, 46.4% of the teachers surveyed consider that cultural empathy is good to carry out the educational process, while 35.2% classify it as regulating the praxis of empathy and only 14.3% consider that this practice is very good. The low percentage of perception of this dimension of empathy is due to the differences in perception and cultural development that exist in educational institutions (see figure 1).

In the items corresponding to the dimension creativity and intercultural flexibility, 36.1% of the teachers surveyed consider it as good, 27.8% consider that it has a regular importance, followed by 22.2% who assume that the practice of these two activities is very good and only 13.9% consider that it is carried out poorly (see figure 1). This result shows that approximately 58.2% of respondents have a positive self-perception, but with many limitations, referring to the realization of activities of creativity and cultural flexibility in rural secondary education.

Correlational analysis of digital competence and intercultural education

Because they are ordinal variables, the normality test is dispensed with, the relationship between the variables is calculated using Spearman's rho, and the hypothesis test is performed at a significance level of 0.05.

When relating the digital acceptance dimension to the educational interculturality variable, Spearman's Rho 0.687 is obtained, there is a moderate positive relationship between the two variables; in addition, the p-value = 0.060 (> 0.05); Therefore, the digital acceptance of teachers does not significantly influence the practice of interculturality in rural secondary education. On the other hand, Spearman's Rho between the dimension management of virtual platforms and the educational interculturality variable is 0.810, which indicates that there is a strong positive relationship; the p-value = 0.008 (< 0.05); indicates that there is a direct relationship between the management of the virtual platform and interculturality in rural secondary education teachers (Table 6).

In the relationship of the use of digital resources and content with the educational intercultural variable, Spearman's Rho = 0.782 is obtained, so there is a good positive relationship between the two variables; on the other hand, as the p-value = 0.013 (< 0.05); It can be said that the use of digital resources and content influences the practice of interculturality in rural secondary education. From the relationship of generation of digital content with educational interculturality, Spearman's Rho 0.736 is obtained, a moderately high positive relationship; also the p-value = 0.015 (< 0.05); leads to the conclusion that the generation of digital content is directly associated with the practice of educational interculturality in secondary education in rural areas (Table 6).

Spearman's Rho for the dimension information management and interculturality is 0.850, which indicates that there is a very good positive relationship; while the p-value = 0.002 (< 0.05); It means that information management significantly influences the intercultural praxis of rural secondary school teachers. On the other hand, Spearman's Rho = 0.585 means that there is a moderate direct relationship between digital pedagogy and interculturality; while the p-value = 0.127 (> 0.05); implies that the management of pedagogy based on the use of digital technology does not significantly influence educational interculturality (Table 6).

Table 6. Spearman's correlation in pairs: digital competence and educational interculturality.

Variable1	**Variable2**	**Correlation**	**95% CI for ρ**	**P-value**
Digital acceptance	Interculturality	0.687	(-0.132; 0.948)	0.060
Variable1	**Variable2**	**Correlation**	**95% CI for ρ**	**P-value**
Platform Management	Interculturality	0.810	(0.202; 0.967)	0.008
Variable1	**Variable2**	**Correlation**	**95% CI for ρ**	**P-value**
Use of cont. and digital recuse	Interculturality	0.782	(0.134; 0.961)	0.013
Variable1	**Variable2**	**Correlation**	**95% CI for ρ**	**P-value**
Generation of cont. digital	Interculturality	0.736	(0.106; 0.944)	0.015
Variable1	**Variable2**	**Correlation**	**95% CI for ρ**	**P-value**
Cont. management digital.	Interculturality	0.850	(0.372; 0.972)	0.002
Variable1	**Variable2**	**Correlation**	**95% CI for ρ**	**P-value**
Digital pedagogy	Interculturality	0.585	(-0.271; 0.925)	0.127
Variable1	**Variable2**	**Correlation**	**95% CI for ρ**	**P-value**
Digital competence	Interculturality	0.810	(0.202; 0.967)	0.008

Finally, the relationship between the teacher's digital competence and self-perception about educational interculturality yields a Spearman's Rho value = 0.810, which evidences the existence of a strong positive relationship between these variables; and the p-value = 0.008 (< 0.05); indicates the level of development of digital competence significantly influences the praxis of educational interculturality among students and teachers of secondary education in rural areas.

DISCUSSION AND CONCLUSIONS

In current education, the concern focuses on the teaching model that teachers develop in the classroom and the level of their digital competence in secondary education (Fernández, 2016). Therefore, the research was aimed at knowing the relationship between digital competence and the intercultural perception of rural secondary education teachers in the province of Huánuco, Peru; where education is conceived as a multicultural phenomenon and pedagogical action is carried out with an intercultural approach.

This new reality requires new strategies and innovative intercultural training so that students are not only able to read and

decode information (digital competence) but also be able to interact positively with an intercultural environment with different cultures (Garrote et al., 2018). In this line, the literature consulted, warns that one of the most tedious activities for secondary school teachers is the integration of digital technology to perform in a multicultural environment, to overcome personal and contextual barriers and achieve effective communication between all members of the educational community.

According to Díaz-Arce & Loyola-Illescas (2021), digital competences are a set of interrelated skills and attitudes that cover technical, informational, content creation, media, communicative, problem-solving-oriented aspects, as well as ethical and strategic decision-making. This competence was developed mostly by teachers, in its first dimension referred to digital acceptance, which is directly concatenated with the management of multiculturalism in rural areas. The same that is expressed in the ability to interact with others, to accept other perspectives and perceptions of the world, to mediate between different perspectives and to be aware of their own valuations about diversity (Gil-Jaureana, 2013).

The use of digital resources and content is a social phenomenon that has transformed the dimensions of communication and collaboration through the internet, since it requires the use of digital content and resources for various purposes in education (De Haro, 2011). As evidenced in the study, the use of resources and content is increasing and constantly changing, teachers show having developed different digital skills, which allow them to explore and integrate correctly in their teaching action, showing an attitude of openness to creativity and flexibility of educational content, compatible with intercultural learning needs, tending to the development of attitudes, skills, knowledge appropriate to the professional, interpersonal and affective requirements that emerge from multicultural contexts.

The creation of new virtual spaces for intercultural exchange and learning facilitates the transmission of intercultural competence (Mira, 2017). Related to this statement, this study shows that the creation or generation of digital content is one of the weakest points of rural secondary education teachers, since teachers show cognitive and technical limitations for the generation of learning content, an activity that represents the highest level in the use of digital technology. This activity is carried out with relative success in intercultural secondary education; in it, the social (cooperative and solidary character) and cultural (free and creative character) of

the person is highlighted (Gil-Jaureana, 2013); requiring a cultural dynamism for the realization of educational activities.

As stated by Borrero & Yuste (2011), the inclusion of ICT in educational systems provides many and diverse ways of obtaining, accessing and managing information and with it knowledge. Coincident with this premise, the management of information carried out in this study, evaluates theacquisition of information from various sources, care and distribution to students, is one of the activities most frequently performed by teachers in their teaching action; the same, which enables the embodiment of activities in an environment of creativity and flexibility, synonymous with a permanent practice of interculturality from the teaching perspective of teachers.

There is a direct relationship between digital competence and the management of interculturality by secondary education teachers in rural areas, which is the result of creative and contextualized didactic strategies implemented in the classroom, making a harmonious convergence of digital competence with the multiculturalism that is cultivated in the community.

In short, the integration of digital technology for the realization of activities in the intercultural environment of rural secondary education promotes the realization of teaching and learning activities for the improvement of educational quality. Here, teachers value the cultural diversity that students carry with them, as well as a positive relationship of integration into the local culture diversified in the years of work experience and intercultural coping, in response to the educational demand of rural schools.

This research work has some limitations in its realization, highlighting: the study sample was extracted only from rural educational institutions, any inference is only valid for that population; scarce recent literature on intercultural education; difficulty in accessing research subjects due to the restrictions caused by COVID-19 and the limited collaboration of teachers in the data collection process. However, overcoming the aforementioned barriers, it was possible to verify the digital competence and self-perception of the interculturality of teachers that has a significant impact on their teaching and learning activity in rural secondary education.

Finally, it is necessary to consider for future studies, deepening the analysis of the variables digital competence and interculturality of teachers of the different educational levels with the pertinent use of digital technology appropriate to different educational contexts. Overcoming problems through the design and implementation of

increasingly efficient strategies that dynamize and optimize the teaching and learning process, in the search for quality education.

DECLARATIONS

Funding: The present study had no funding from individuals or institutions, the cost of the research was funded by the authors themselves.

Conflicts of interest: The authors declare that they have no conflict of interest in this research.

Ethical standards and informed consent: All procedures followed were in accordance with respect for individuals, through voluntary consent, protection of privacy, confidentiality and the right to participate without retaliation. The informed consent of the directors and teachers of the educational institutions that took part in the study was obtained.

REFERENCES

[1] Barreiro, M. (2018). Proposal for the introduction of the classroom invested in teaching in Economics. Hekademos: digital educational magazine, 24, 52-59.

[2] Barreto, R. & Tulia, C. (2013). Training and development of intercultural competence in virtual learning environments. National University of Distance Education (Spain). Faculty of Education. Department of Didactics, School Organization and Special Didactics

[3] Borrero, R., & Yuste, R. (2011). Digiculturalidad.com. Interculturality and ICT united in the development of the competency approach of the curriculum, Interculturality and school. Pedagogical perspectives in the community construction of the intercultural school. Editorial Octaedro.

[4] Cabero, J. (2015). Trends for digital learning: from closed content to activity-focused material design. Journal of Distance Education (RED), (32). https://revistas.um.es/red/article/view/233041

[5] Castañeda, L. & Adell, J. (2013). Personal learning environments: key to the networked educational ecosystem. Alcoy: Ivory.

[6] Castillejos, B. (2019). Information management and digital content creation in the millennial prosumer. Apertura, 11(1), 8-21. http://dx.doi.org/10.32870/Ap.v11n1.1375

[7] Cedeño, E. (2019). Virtual learning environments and their innovative role in the teaching process. Refuse, 4(1), 119-127. https://revistas.utm.edu.ec/index.php/Rehuso/article/view/1888

[8] Contreras, L. E., Escobar, I., & Tristancho, J. A. (2013). Educational strategies for the use of ICT in higher education. Technura, 17 (1), 161-173, 2013, https://doi.org/10.14483/22487638.7246

[9] Creswell, J. (2014). Research design. Qualitative, Quantitative and Mixeed Methods Approaches. SAGE, Publications, Inc.

[10] De Haro, J. J. (2011). Social networks for education. Anaya multimedia.

[11] Díaz-Arce, D. & Loyola-Illescas, E. (2021). Digital competence in the context of COVID 19: a view from education. Innova education,3 (1), 120-150. http://dx.doi.org/10.35622/j.rie.2021.01.006

[12] Eleizalde, M., Parra, N., Palomino, C., Reyna, A., & Trujillo, I. (2010). Learning by discovery and its effectiveness in the teaching of Biotechnology. Journal of Research, 34(71), 271-290. https://www.redalyc.org/articulo.oa?id=376140386013

[13] Fernández, J. P. (2016). The acquisition and development of digital competence in secondary school students: a case study. Cuadernos de Investigación Educativa, 7(2), 83-98. https://doi.org/10.18861/cied.2016.7.2.2612

[14] Garcia, I. (2010). Evaluation system. Salamanca: University of Salamanca. Retrieved from https://www.eumed.net/libros-gratis/2010b/687/687.pdf

[15] Garrote, D., Arenas, J. Á., & Jiménez, S. (2018). Intercultural education in the classroom: teachers and ICT. Social Prism Magazine, (22), 326-345. https://revistaprismasocial.es/article/view/2580

[16] Gil-Jaureana, I. (2013). Intercultural approach and sociocultural animation: convergences and reflections. Revista Iberoamericana de Educación, 61(4), https://doi.org/10.35362/rie614924

[17] Guzmán-Simón, F., García-Jiménez, E., & López-Cobo, I. (2017). Undergraduate student's perspectives on digital competence and academic literacy in a Spanish University. Computers in Human Behavior,74, 196-204.https://doi.org/10.1016/j.chb.2017.04.040

[18] Hernández, R., Fernández, C., & Batista, M. del P. (2014). Research methodology. Mc Graw Hill-Education.

[19] Leiva, J.J. & Priegue, D. (2012). Intercultural Education and ICT: pedagogical keys to innovation and social change in the XXI century. Monograph: Pedagogical experiences, innovation and research in university educational environments, 9, 32-43. https://www.redalyc.org/articulo.oa?id=349532305005

[20] López, E. & Ortiz, M. (2018). Use of virtual learning environments to improve academic performance in fifth grade students of the Pozo Nutrias 2 educational institution. (Master's Thesis). Norbet Weiner University, Lima, Peru.

[21] Marcelo, C., Yot, C., & Perera, V. (2016). Technological and techno-pedagogical knowledge in the teaching of science at the university. A descriptive study. Science Education, 34(2), 67-86. https://doi.org/10.5565/rev/ensciencias.1552

[22] MINEDU (2005). Interculturality in education. UNICEF-Government of Peru.

[23] Mira, M. (2017). Assessment of intercultural competence through ICT: e-PEL for language learning. International Journal of

Educational Research and Innovation (IJERI), 7, 103-107. https://rio.upo.es/xmlui/handle/10433/4926

[24] Peiró i Grègory, S., & Merma, G. (2012) Interculturality in education. Situation and foundations of intercultural education based on values Barataria. Revista Castellanomanchega de Ciencias sociales, 13, 127-139. https://revistabarataria.es/web/index.php/rb

[25] Perdomo, B.; Gonzalez, O.; & Barrutia, I. (2020). Digital competences in university teachers: a systematic review of the literature. Media and ICT Education, 9(2), 92-115. https://doi.org/10.21071/edmetic.v9i2.12796

[26] Perez, P. (2013). Mixed-method designs in education research: A concrete experience. Educare Electronic Magazine, 15(1), 15–29. https://bit.ly/3mHGyr

[27] Regil, L. (2014). University Digital Culture [Unpublished doctoral thesis]. Autonomous University of Barcelona (UAB), Barcelona, Spain. https://ddd.uab.cat/pub/tesis/2014/hdl_10803_283956/lrv1de1.pdf

[28] Rodríguez-García, A.M., Raso-Sánchez, F., & Ruiz-Palmero, J. R. (2019). Digital competence, higher education and teacher training: a meta-analysis study on the Web of Science. Pixel-Bit. Journal of Media and Education, 54, 65-81. https://doi.org/10.12795/pixelbit.2019.i54.04

[29] Santos, M.A., Lorenzo, M., & Priegue, D. (2013). (RED) Connecting teachers for the development of interculturality. Education XX1, 16 (1) 63-83. https://www.redalyc.org/pdf/706/70625886004.pdf

[30] Soto-Villegas, R.S. (2018). Influence of the use of the interactive whiteboard on the mathematical competence of students of the fourth grade of primary education of the educational institution Luis Pinto Sotomayor de Moquegua, 2017 [Postgraduate Thesis]. Universidad Nacional San Agustín, Arequipa, Peru.

[31] Teo, T. (2008). Technology acceptance in educatiob. Resarch and Issues. Singapore: Nanyang Tecnologicas University.

[32] Torrecilla, S. (2018). Flipped Classroon: An effective pedagogical model in Science learning. Revista Iberoamericana de Educação, 76(1), 9-22. https://doi.org/10.35362/rie7612969

[33] UNESCO (2020). Guidelines for the development of open educational resources policies. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000373558