

Holistic knowledge and research practice in teachers. A study in virtual learning contexts during the COVID-19 pandemic.

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Abstract

The descriptive correlational study, whose main purpose was to determine the degree of relationship between the holistic knowledge of research and the practice of research in primary school teachers in virtual learning contexts during the COVID-19 pandemic, involved 90 primary school teachers from different Local Educational Management Units of the Regional Education Management of La Libertad, Peru. Two structured questionnaires were used to collect data on holistic knowledge and research practice, the validity of which was established through expert judgment and reliability with the split-half method, with r values greater than 0.80. After the analysis of correlations on the study variables, applying the Spearman Rho coefficient, the

Key words:

Holistic knowledge, research practice, virtual learning contexts



values $r_s=0.209$ and $p=0.049<0.05$ were found, which allowed rejecting the null hypothesis and proceeding to accept the alternative hypothesis; that is, there is a direct, moderate and significant relationship between holistic scientific knowledge and the practice of research in virtual learning contexts generated in the pandemic. Likewise, similar results were obtained when relating holistic knowledge with the dimensions of the research practice: the exploration and observation of educational phenomena, and the planning and implementation of projects.

Conocimiento holístico y práctica de la investigación en docentes. Un estudio en contextos virtuales de aprendizaje durante la pandemia por COVID-19

Palabras clave

Conocimiento holístico, práctica de la investigación, contextos virtuales de aprendizaje

Resumen

El estudio descriptivo correlacional, que tuvo como propósito principal determinar el grado de relación entre el conocimiento holístico de la investigación con la práctica de la investigación en docentes de primaria en contextos virtuales de aprendizaje durante la pandemia por COVID-19, participaron 90 docentes de primaria de distintas Unidades de Gestión Educativa Local de la Gerencia Regional de Educación de La Libertad, Perú. Se utilizaron dos cuestionarios estructurados para el recojo de datos sobre conocimiento holístico y práctica de la investigación cuya validez se estableció mediante juicio de expertos y la confiabilidad con el método de mitades partidas, con valores de $r > 0,80$. Luego del análisis de correlaciones sobre las variables de estudio, con aplicación del coeficiente de Rho de Spearman, se encontraron los valores $r_s=0.209$ y $p=0.049<0.05$, los que permitieron rechazar la hipótesis nula y se procedió a aceptar la hipótesis alterna; es decir, existe relación

directa, moderada y significativa entre conocimiento científico holístico y práctica de la investigación en contextos virtuales de aprendizaje generados en la pandemia. Asimismo, se obtuvieron resultados similares al relacionar el conocimiento holístico con las dimensiones de la práctica de la investigación: la exploración y observación de fenómenos educativos, y la planificación e implementación de proyectos.

1. Introduction

Education in these times and in all academic contexts, orients and commits the person to pose and assume challenges and challenges to respond successfully to the diverse and complex relationships that arise in everyday life. To this end, students and teachers have in common the responsibility to be prepared to face globalization and technological progress in the dynamics that the changing and complex world links to different realities and interactions in which relevant, creative, timely and coherent decisions must be made in the different contexts of action of the educational actors.

In the academic scenario of professional training in universities, in any of the study programs, it is a requirement to include and develop in the curriculum, research and innovation activities as a training profile that allows a transversality that goes from formative research to end-of-career research. In teacher training, both at the university level and in Teacher Training Institutes and Colleges should train professionals with a research profile, in this route, it requires that students progressively develop research skills in all subjects. Linking it to the development of capacities and attitudes for research depends exclusively on a rigorous methodological support, both of the scientific method, technological tools and statistical culture allied to research. The formative processes contribute to the mastery and management of certain abilities and skills that the student demonstrates from the exercise of sensory processes to the final understanding of the fact or phenomenon studied.

The proposal presented by the National Convergence Forum (2000), which urges to meet the demands of the national consultation, specifies that "the curricular moments indicated are based on the initiative of each learner, or on the convergence between him/her and his/her peers, with the facilitators (teachers) and with the other socio-cultural actors of education" (p. 37); this curricular conception implies innovating the curriculum in the classroom permanently, updating its quality and relevance, integrating theory with practice, as an opportunity to innovate, update and practice new forms of work in the classroom, as an opportunity to innovate, update and practice new forms of work in the classroom. 37); this curricular conception implies permanently innovating the curriculum in the classroom, updating its quality and relevance, integrating theory with practice, as an opportunity to innovate, update and practice new ways of working in the classroom through research processes in the field of action where the future professional will work. In this sense, Aparicio Salas (2018) determined in his study that research skills are significantly related to teaching practice at the classroom level.

Basic education teachers trained in the Higher Pedagogical Institutes and Teacher Training Colleges in Peru, go from the formative stage to the application of their knowledge in research in their field of action, this implies that they have acquired research skills with the application of the scientific method of observation, describe, analyze and interpret theoretical and methodological information that will allow them to propose a research plan from personal reflection on their performance in the face of classroom problems, school climate, social relations, media and materials, among other problems that are found in the educational reality in contexts of virtuality and social confinement.

The national curriculum in its theoretical and methodological foundation, specifies that students in the three educational levels of basic education, should develop scientific inquiry skills in all curricular areas regulating progress according to their level, for this, teachers have the responsibility to guide and direct the learning process with experiential and interactive methodologies that facilitate scientific inquiry of students. For this, it is necessary that teachers have a scientific attitude, abilities, skills and a favorable aptitude towards research with a sufficient academic profile in research as an

important articulating component in the educational quality that is currently demanded for all.

In the training and application of scientific knowledge by the teacher in the classroom, there are some deficiencies in both the formative and the applicative part, these difficulties do not meet the expectations and demands of parents and students, a situation that leads to serious deficiencies regarding the quality proposed by global and national educational policies. In order to control these academic, formative and action deficiencies, a research was proposed that starts from the practical reflection from the formative classroom and teaching practice that allows the consolidation of their training in research skills and their application from their pedagogical action. From the above mentioned and in view of the need to know their formative trajectory and the route of teaching performance, the purpose of which is to find the degree of association between the level of knowledge and the investigative practice in regular basic education teachers from the proposal of the Ministry of National Education.

The present circumstances in the Peruvian educational reality require the teacher to face challenges that arise in the knowledge society, challenges related to new ways of training in a virtualized space that is complemented by a pandemic scenario, where the student can locate a variety of knowledge without the teacher's participation. For this reason, it is important that the person in charge of the training process is able to respond to learning situations that require him/her to possess research competencies, only in this way can he/she guide the student to optimize the achievement of learning and the development of diverse skills.

Junting (2018), in his correlational study found as results: there are strong discrepancies in the relationship between the variables teaching strategies and research competencies, he points out that the majority considers as regular the teaching strategies applied within the classrooms, implying with this the assimilation of research competencies considered as sometimes adequate. It recommends that training be provided to teachers in research and innovative strategies to improve teaching practice and optimize the strengthening and development of students' research skills.

Saavedra (2015), investigated on research competencies in teachers benefited by the training and access strategy for the pedagogical appropriation of ICT and as a result found that teaching competencies in relation to ICT are satisfactory, reflecting that the most frequent ages of better mastery are those between 30 and 49 years (64.5%) and ages over 50 years, show certain limitations in this field. Finally, it recommends the need for ongoing teacher training and updating to develop pedagogical, attitudinal and disciplinary competencies, as well as the development of communicative, evaluative, technological and research competencies that contribute to the training and management of technological tools to improve the educational service.

Perez (2015) in his research concluded that there is evidence that the predominant learning style is the theoretical followed by the reflective style. In addition, the teaching strategies according to the teacher, reflects the management of appropriate teaching strategies. These results show that teacher training in the reflective aspect is a priority in the sense that it helps the teacher's formative research.

De Durán, Marcano and Moronta (2009) conducted a study with basic education teachers in Venezuela and found results regarding generic, basic and specific research competencies. Regarding the first ones, it was found that basic education teachers did not manage to develop them completely, although they are the basics to carry out their educational activities; in relation to the basic ones, a low level of competencies was found, to the extent that teachers have difficulties in using techniques and tools related to the design and execution of research projects; and, in relation to the specific ones, it was found that teachers do not possess them or have little mastery of them, since they have not yet developed certain necessary generic and basic competencies, which disturbs the development of their educational activities. This means that the research competencies of the basic education teachers in the sample were limited to the extent that they lack the knowledge, abilities, skills and attitudes necessary for them to effectively apply research methods and techniques that transport them to the educational reality with a critical and reflective attitude. This classification of competencies responds to the classification presented by Vargas (1999), quoted by Tobón (2005, pp. 66 ff.)

The research work considered fundamentals and theories regarding the knowledge and application of research by basic education teachers in the light of the new approaches and educational proposal proposed by the national educational policy expressed in the national curriculum for regular basic education. The results show that only three of the factors that could influence the achievement of research competencies, two of them correspond to the student's own abilities such as the use of strategies and skills to research and learn better.

For the development of the research work, the starting point was the review of approaches and learning theories that support the study variables with respect to knowledge and research practice. For this purpose, it is necessary to start from three current theoretical foundations of learning and two base theories, as well as concepts on each of the study variables, information that supports the scientific rigor of the research.

According to the proposal of López (2010), he proposes the need for educators to have adequate and sufficient research training to strengthen their pedagogical action, only then will improve their teaching practice and thus improve the quality of educational service, among the necessary theoretical foundations that promote this training need, by way of factors are:

Factor focused on scientific knowledge. The need to make the teaching-educational process scientific, considering that educating is understood as a science because it follows rigorous procedures that make it possible to develop diverse knowledge in the student-teacher interaction.

Factor linked to balanced knowledge. The analysis of the dialectical relationship between the objective and the content, this implies that everything that is done has an established purpose, but it is necessary to contribute to knowledge in such a way that there is a balance between the practical and the abstract, the real and the non-real.

Factor associated with integrated knowledge. The harmonious integration of the three components: academic, labor and research, that means that the educator, when developing diverse academic actions, also allows labor development, which will be solved by

making use of research skills. If these are integrated, a balanced development of knowledge will be achieved.

Factor linked to holistic knowledge. The interdisciplinary relationship in the different structural levels of the teaching-educational process; this implies that all areas of human knowledge are related, coexist between different structurally sequenced levels, which is given in the teaching practice that is permanently present in the classroom. In the pedagogical practice it should be sought that diverse scientific knowledge participates with practical questions that generate the need to compare and argue in front of it.

Factor related to disciplinary knowledge. It consists of defining the curriculum for the process, training and development of research skills; it is necessary that from the curricular space it is clear "in what" or "how" the skills should be developed within the curriculum, generating activities that strengthen the teaching work, which are integrated to develop the necessary skills for research.

Factor associated with educational praxis. Understanding and defining research skills as a form of teaching content; this implies that, in the pedagogical development, educators should create conditions for teaching research skills as part of their teaching process; this means that in their learning sessions they should try to provide examples where the skills of reasoning, systematizing, arguing, hypothesizing, among others, are present.

Educational practice consists of the dynamics of teaching and learning in interaction with others, one of these actions is that the teacher develops and applies a set of methodological strategies and demonstrates research skills in the training process and the construction of the scientific method; According to Puche's (2000) inquiry, he affirms that from the age of five, characteristics of rational thinking can be generated, which is linked to scientific thinking, it is known that when talking about science, it is not only about using a laboratory, but it refers to cognitive operations that appear spontaneously and the curiosity of each age group.

According to this theoretical position of the aforementioned author, it is assumed that during the growth process and in the different stages (childhood, adolescence, youth and adulthood) the capacity for

curiosity, exploration, inquiry, experimentation and verification will always be present as basic elements that strengthen as time goes by and depending on the actions performed; among these, the following investigative capacities are considered as part of knowledge.

Ability to explore and observe. It is a basic ability that allows systematizing information, understanding the kind of common peculiarity shared with other elements and the extent of the kind found in a relationship of elements that are part of it. Classifying is a conventional situation that allows dividing a set of elements into different groups, but with an established pattern, by categories that respond to some purpose.

Ability to plan and implement. It allows the development of several actions that, in a sequenced manner, require order, to be done in advance, to prevent and always with the possibility of rethinking an established activity. According to Puche (2001), planning is the process of generating possible representations of what will happen in the future, the activities to be carried out, the actions to be observed and the control of such situations.

Ability to formulate and test hypotheses. It consists of creating reasoning and propositions that build questions and elaborate initial answers in the learning process, according to Puche (2000), it is considered the ability to search and identify answers to problematic situations adequately posed, in some cases it is necessary to apply rules or agreements already known from situations already experienced, to new situations. It should be considered that the formulation of the hypothesis constitutes the attribute of scientific logic and discoveries, since the development of science is based on previously stated conjectures.

Ability to experiment and demonstrate. Process by which a theory is put in contrast with reality, putting it to the test, in order to be able to assume a concrete law or theory. For this purpose, various processes have been experienced, such as discovering, testing or demonstrating observed situations, as well as scientific principles.

According to the procedure proposed by Chalmers (1997), when a fact or phenomenon is tested by means of experimentation, this could be demonstrated in a simple way with the support of basic

statistics, and therefore the hypothesis is accepted or otherwise rejected. He warns that when experimentation is carried out, many of the hypotheses survive, however, others are rejected and discarded completely and can be reviewed at another time. Experimentation is the main resource for doing science, it is associated with formulating hypotheses, in the case of adults and children, every experiment proves or denies the hypothesis that was previously formulated.

The Ministry of Education (2012), in response to global and national educational policies, formulated the Framework of Good Teaching Performance, which describes 40 performances that teachers must show, which are distributed in nine competencies and four domains or fields of action. These performances are required and are observed during the exercise of the profession with follow-up, monitoring, support and strengthening plans in charge of a committee appointed by the institutional management.

In performance 32, it states: "The teacher develops, individually and collectively, research projects, pedagogical innovation and improvement of the quality of the school's educational service. Knows approaches and methodologies for the development of pedagogical innovation and school management projects. Uses this knowledge to identify and develop proposals for change in the pedagogical field, seeking to articulate teaching with the needs of students and the school with the processes of social and cultural development of the community".

To fulfill this role, the teacher designs, in collaboration with his/her peers and in collegiate events, pedagogical innovation projects and improvement plans. Participates in the execution, monitoring and evaluation of educational research, pedagogical innovation and learning projects, assuming individual and collective responsibilities, in coordination with the school's management and hierarchical staff. Proposes the systematization of experiences, practical reflection to project improvement plans and pedagogical innovation, to optimize the educational service.

For Diaz (1998),

Classroom research does not only refer to a set of teaching strategies but to a global way of understanding the teaching and learning

process with innovative strategies based on classroom research defined as a work methodology as a theoretical framework for action that integrates the contributions of constructivist psychology with a complex conception of educational reality (p. 430).

The interactive and dynamic work that takes place in the classroom environments, allows to assume an exploratory attitude of both the teacher and the learner, commits to be compatible with a constructivist conception of the acquisition of knowledge, as well as to incorporate the processes of social interaction in the classroom. In addition, it provides an adequate environment that stimulates the autonomy and creativity of the student, linked to the ontological conceptions about certain knowledge that the learner possesses. From this academic path, it makes it possible to incorporate the various topics of study to inquire about what is proposed to be known.

Researchers in the educational field related to research-based learning affirm that it requires linking learning experiences and situations to the processes of the storytelling method, that is, starting from the formulation or identification of problem situations, recognizing the learners' previous knowledge and exposing them to situations that lead to cognitive conflicts between preconceptions and new concepts, in order to apply knowledge to situations in which it can be transferred.

The pedagogical work related to the research-based learning approach requires a set of elements that contribute to a better way of teaching and learning through inquiry. In this sense, the teacher is implemented with methodologies, strategies, means and materials that allow him to go through these channels or means for teaching in real and virtual or mythical contexts, depending on the interaction scenario. Taking the vision of Cañal (1988), regarding the investigative task in the classroom, he proposes as didactic principles: the autonomy of those who participate in a process of knowledge construction, achieving an integral personality and autonomous behavior; the communication that occurs in the interaction between the members of the pedagogical action and an adequate flow of inter and intra systemic information that favors the information, communication and transformation processes; the

environmental approach that proposes a curriculum related to the socio-environmental and daily context of the student, which allows reflecting about the reality that surrounds him and allows him to act on himself, society and nature. To optimize these processes, it requires that both teachers and students are guided by research as a method that articulates with internal psychological processes and achieve autonomous, cooperative and meaningful learning as a response to the actions of observing, hypothesizing and experiencing learning situations inside and outside the classroom.

In the educational history of the last century, the events of 2020 as a result of the COVID-19 pandemic marked a turning point. Governments and schools could not give an accurate response to a problematic situation that came as a surprise. This problem, plus the existing one, has become a major challenge to provide a response by educational authorities, teachers and even parents. Colás-Bravo (2021) emphasizes that the use of ICT in education, research training and education for a sustainable world are challenges for current educational research. Likewise, he notes on the subject of the pandemic, ICTs and education:

In this sense, we can advance that the current situation, marked by the pandemic originated by COVID 19, has generated substantive changes at the educational level, which require new knowledge. Specifically, it has meant the immediate and extensive irruption of ICT in educational systems. While ICTs were previously understood as basically support tools for teaching and learning, COVID 19 has brought them to the forefront, making them the essential and irreplaceable medium for teaching at all educational levels. This has created a whole series of problems that need to be investigated. (p. 321)

Faced with a complex educational scenario such as the current one, which requires more knowledge and better research attitudes from teachers, the study was based on the problem: To what degree are holistic scientific knowledge and scientific research practice related in primary school teachers in virtual learning contexts during the covid-19 pandemic, whose objective was to determine the degree to which holistic scientific knowledge and research practice are related,

and the hypothesis: There is a direct relationship between holistic scientific knowledge and research practice.

2. Methodology

Considering the relationship established between variables, the research is descriptive-correlational with a quantitative and cross-sectional approach, because it analyzes data on variables collected over a period of time on a sample population or predefined subset. (Echevarría, 2016; Hernández, Fernández and Baptista, 2014; Kerlinger, 1986).

The study sample consisted of 90 teachers, distributed in 50 men and 40 women with a teaching degree at the primary level from ten Local Educational Management Units of the Regional Education Management of La Libertad, considering the proportional allocation criterion. The sample was selected according to the criterion of selection by registration of enrollment in a University Complementation Program at a university in the city of Trujillo in the 2020-II academic semester. The sample was selected on the basis of convenience or focused by the researchers. Teachers from two provinces far from La Libertad were not included because they did not have the necessary quota. For the selection of the sample, no mathematical or statistical formula was necessary (Carrasco, 2009).

Table 1

Operationalization of variables

Variable	Operational definition	Dimensions
Holistic knowledge in research	The holistic knowledge in scientific research in teachers of pedagogical training in terms of the management of approaches or review of the state of the art was determined from the scores obtained when applying a standardized questionnaire.	Knowledge of research approaches. Review of research background.

Research practice*.	The practice of scientific research in pedagogical training teachers with classroom work was determined by means of scores obtained from the application of a standardized questionnaire regarding the exploration and observation of facts, as well as the planning and implementation of research actions.	Exploration and observation of phenomena. Project planning and implementation.
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Note: (*) The dimensions of research practice have been taken in relation to pre-field actions. The actions related to formulation and testing, and experimentation and demonstration have not been taken into account due to the restrictions inherent to the COVID-19 pandemic period.

The research used two techniques to collect data. The survey as a procedure that allowed, through its respective instrument, to collect data on the two study variables on knowledge and practice of research in virtual learning contexts. The instruments used were the questionnaire on knowledge and practice of research in teachers, which were previously validated: validity with expert judgment and split-half reliability with values of $r > 0.80$. Prior to the administration of both data collection instruments, the following procedure was followed: elaboration, revision, validation and reliability based on judges' criteria and statistical process.

The documentary analysis technique as a procedure made it possible to collect information from written sources with relevant information, both at the theoretical and empirical levels, on the knowledge and research practice in the actions of basic education teachers. The instrument used was the recording of data with the support of summary and bibliographic cards on the information regarding the study variables.

The data were processed using the following procedure:

Elaboration of the dimensional database in the two study variables.

Organization of data in tables with calculation of percentage and position measurements

Organization of statistical figures with application of parametric coefficient according to the respective normality test

The procedure for data processing and analysis was by SPSS software and hypothesis testing by crosstabulation to see the degree of association between variables using Spearman's Rho coefficient.

For the development of the research, fundamental ethical aspects were taken into account: Informed consent of the participants, via telephone; Law N° 30035, Law N° 29733, personal data protection law; Legislative Decree N° 822, copyright law promoted by Concytec; avoiding omissions of references due to plagiarism issues.

4. Results and discussion

Table 1

Levels of holistic knowledge in research in virtual learning contexts in primary school teachers of regular basic education in La Libertad -2020.

	Scale	Level	fi	%	Media	Ds*	CV (%) **
Dimensions							CV (%)
Holistic knowledge	0 - 4	Inadequate	4	4.4			
	5 - 8	Suitable	57	63.3	7.8	2.0	25.9
	9 -12	Very suitable	29	32.2			

Note: Database of the variable holistic knowledge in scientific research by basic education teachers. Ds=standard deviation; **CV=coefficient of variation.

In terms of holistic knowledge, the average score recorded was 7.8 points, which is at the adequate level insofar as it is included in the

interval 5-8 and concentrates 63.3% of the elements of the sample. The series of scores for the variable is characterized as homogeneous, since the coefficient of variation equivalent to 25.9% is less than 33%. These results confirm that the teachers in the sample have holistic knowledge of research obtained as part of their professional training, continuing education or as self-taught, and that at the sample level they possess it in an analogous manner.

Table 2

Results of the dimensions of research practice in virtual learning contexts in primary school teachers of regular basic education in La Libertad -2020.

Dimensions	Scale	Level	fi	%	Media	Ds*	CV (%) ** CV (%)
Exploration and observation.	0 - 4	Under	2	2.2	8.0	1.9	23.6
	5 - 8	Medium	5	62.2			
	9 - 12	High	3	35.6			
			2	6			
Planning and implementation.	0 - 4	Under	1	11.1	7.9	2.4	30.4
	5 - 8	Medium	4	53.3			
	9 - 12	High	3	35.6			
			2	6			

Note: Database of the scientific research practice variable. SD=standard deviation; **CV=coefficient of variation.

The results of the dimensions related to research practice show that in the exploration and observation dimension an arithmetic mean of 8.0 points was obtained, which corresponds to the medium level and accounts for 62.2% of the sample, while in the planning and implementation dimension the average recorded was 7.9 points, which also corresponds to the medium level and accounts for 53.3% of the sample. It should be noted that the scores in these dimensions

are homogeneous because they register lower percentages of the coefficient of variation of less than 33%. These results show that teachers develop research activities in virtual learning contexts during their teaching practice and indicate that it is analogous for the various elements that make up the sample.

Table 3

Normality test of the holistic knowledge variable and the dimensions of research practice by primary school teachers of regular basic education in La Libertad -2020.

Variables/dimensions	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Holistic knowledge	0,182	90	0,000	0,953	90	0,002
Exploration and observation	0,149	90	0,000	0,952	90	0,002
Planning and implementation	0,130	90	0,001	0,941	90	0,001

Note. a. Lilliefors significance correction.

The table above represents the scores of the holistic knowledge variable and the dimensions of the research practice variable for the verification of the normality test; since the sample is larger than 50 items, the Kolmogorov-Smirnov and Shapiro-Wilk criterion is assumed when observing the significance levels (sig.). It was found that the holistic knowledge variable and the dimensions of the

research practice variable do not have normal distribution because the significance values are less than 0.05. As seen above, the contrast statistic used was Spearman's Rho coefficient, which is represented as r_s .

Table 4

Formulation and testing of hypotheses for the association of variables in primary school teachers of La Libertad in virtual learning contexts during the COVID-19 pandemic.

Formulation of hypotheses	r_s	α^*	p	Decision
Ho: There is no relationship between holistic knowledge and research practice. $r_s = 0$	0.	0.	0.0	The null hypothesis, Ho, is rejected and the alternative, Ha, is accepted: the relationship is direct, moderate and significant ($p < 0.05$).
Ha: There is a direct, moderate and significant relationship between holistic knowledge and research practice. $r_s > 0$	2 0 9	0. 05	49	
Ho1: There is no relationship between	0. 41	0. 05	0.0 00	The null hypothesis,

holistic knowledge with exploration and observation of research practice. $rs01 = 0$ H_{a1} : There is a direct, moderate and significant relationship between holistic knowledge with exploration and observation of research practice. $rsa1 > 0$	0			H_{01} , is rejected and the alternative hypothesis, H_{a1} , is accepted: the relationship is direct, moderate and significant ($p < 0.05$).
H_{02} : There is no relationship between holistic knowledge with planning and observation in research practice. $rs02 = 0$ H_{a2} : There is a direct, moderate and significant relationship between holistic knowledge with planning and observation in research practice. $rsa2 > 0$	0.220	0.05	0.037	The null hypothesis, H_{02} , is rejected and the alternative hypothesis, H_{a2} , is accepted: the relationship is direct, moderate and significant ($p < 0.05$).

Note: Interpretations according to Ponce Renova (2020). (*) Significance level, denoted as alpha, is the possibility of rejecting the null hypotheses (H_0, H_{01}, H_{02}) being true.

Before entering into the discussion in full, it is necessary to make an account of the averages obtained in the holistic knowledge of teachers

have registered an adequate level. In relation to the variable, it is observed that teachers have reached an adequate level having registered an average of 7.8 points, placing them at a medium level, which agrees with the research of Saavedra (2015), who found that teachers are very favorable to show high indexes in research competences and show it in their performance in their professional profile, but differs from the results arrived at by De Durán, Marcano and Moronta (2009). The medium level of holistic knowledge of research constitutes a strength in educational research with a view to studying the educational phenomena of the present thinking about the future in order to achieve sustainability, which has been considered as a goal by the UN and has been designed as a challenge in AGENDA 2030. Precisely, sustainability is understood as the capacity to preserve resources and adopt formulas to face changing conditions, as indicated by Colás-Bravo (2021).

Regarding the practice of research, it can be seen that in the dimensions of exploration and observation, planning and implementation of projects by teachers have been located at the medium level, results that agree with the study conducted by Junting (2018), who found in teachers a regular level in the management of teaching strategies and research skills, since most consider as regular the teaching strategies applied in the classroom in the development of curricular programs, although in this aspect it differs from the present study that responded to virtual learning contexts. Likewise, the results in the research practice agree with those of Saavedra (2015), who investigated on research competencies in teachers benefited by a didactic strategy for the pedagogical appropriation of ICT, when these were basically support tools for teaching and learning; however, currently the pandemic has brought them to the forefront, as a fundamental means in the teaching-learning process at various educational levels. Likewise, the results found place teachers in a position to develop an adequate pedagogical action, as described by López (2010).

In relation to the contrasts of the hypotheses, it is observed that, between holistic scientific knowledge and research practice, there is sufficient evidence to reject the null hypothesis because $p = 0.049$, which indicates that there is a direct relationship with statistical

significance ($p < 0.05$). And in relation to the theory on holistic knowledge and practice by the teacher, it is confirmed that research training is a crucial and important factor that teachers should have in their training process, which constitutes a factor centered on scientific knowledge. The training institutions have the duty to train teachers with a researcher profile, considering that the action of educating follows rigorous procedures that make it possible to develop diverse knowledge in the student-teacher interaction. In this perspective and in a dialectic dynamic, the educational system will change course and teaching practice will improve. Educational research must contribute to sustainability, to achieving sustainable awareness. As Colás-Bravo, Magnoler & Conde-Jiménez (2018) indicate, consciousness is the highest level of vital learning. Precisely, a prominent author in the educational field, who appeals to the theme of consciousness as the cornerstone of education is Freire (1990), who argues that education resides precisely in conscientization, in liberation (Freire, 2005).

5. Conclusion

Considering the variables of the study, a direct, moderate and significant relationship was found between holistic knowledge and research practice by primary school teachers of regular basic education in La Libertad - 2020 during the COVID-19 pandemic period, registering a value of $r_s = 0.209$ with $p = 0.049 < 0.05$, so the null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the more holistic knowledge, the better the research practice. Regarding the relationship between holistic knowledge of research and each of the dimensions of research practice, it was found that: there is a direct, moderate and significant relationship between holistic knowledge with exploration and observation of educational phenomena, which in the study registered $r_s = 0.410$ with $p = 0.000 < 0.05$, proceeding to reject the null hypothesis and accept the alternate hypothesis; similarly, there is a direct, moderate and statistically significant relationship between planning and observation with knowledge in research, which in the study registered $r_s = 0.220$ with $p = 0.037 < 0.05$, which allowed rejecting the null hypothesis and accepting the alternate hypothesis. Precisely, the holistic knowledge of research, in terms of the

management of approaches and review of the state of the art with the exploration and observation of educational phenomena, and the planning and implementation of research projects in the practice of primary school teachers who are in middle levels and are associated, turn out to be strengths that should be enhanced and taken advantage of to direct research policies at the classroom level, educational institution and educational system in general, whose results would contribute to the improvement of children's education. In this order of ideas, research should not only be associated by law to university teaching, it should also be extended to teachers of different educational levels, which would substantially result in the improvement of educational quality; thus performance 32 of the *Framework for Good Teaching Performance* (Ministry of Education, 2012), which states: "The teacher develops, individually and collectively, research projects, pedagogical innovation", would cease to be a simple declarative expression.

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