

ORIGINAL ARTICLE

Model of inquiry strategies for the development of critical and creative thinking in primary school students

Modelo de estrategias de indagación para el desarrollo del pensamiento crítico y creativo en estudiantes de educación primaria

Modelo de estratégias de investigação para o desenvolvimento do pensamento crítico e criativo em alunos do ensino fundamental

Edith Vásquez¹

Universidad César Vallejo, Chiclayo- Lambayeque, Perú

 <https://orcid.org/0000-0001-9015-5177>
edvasquez@ucvvirtual.edu.pe

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KEYWORDS

strategies, inquiry,
model, creative
thinking, critical
thinking.

ABSTRACT. The objective of this research was to develop a model of inquiry strategies for the development of critical and creative thinking in students of the sixth grade of primary education in Lajas, Chota (Peru). Twenty-three students participated who made up the study population and sample. The research carried out is of a direct and proactive descriptive level, with a mixed methodological approach. The instruments for data collection were developed based on the study variables with the Likert scale and were applied to students, teachers, directors, and parents. Thanks to the information obtained as a diagnosis, the starting point was obtained to elaborate the proposed model. The problem observed was that students and teachers had limitations concerning critical and creative thinking; this allowed the development of the proposed inquiry model, which was validated through expert judgment. Furthermore, it was concluded that the students had a low level of critical and creative thinking development, constituting one more reason to design the model.

PALABRAS CLAVE

estrategias, indagación,
modelo, pensamiento
creativo, pensamiento
crítico.

RESUMEN. Esta investigación tuvo como objetivo elaborar un modelo de estrategias de indagación para el desarrollo el pensamiento crítico y creativo en estudiantes del sexto grado de educación primaria de Lajas, Chota (Perú). Participaron 23 estudiantes que conformaron la población y muestra de estudio. La investigación realizada es de tipo básica y nivel descriptivo propositivo, con enfoque metodológico mixto. Los instrumentos para la recolección de datos se elaboraron en base a las variables de estudio con la escala de Likert y fueron aplicadas en los estudiantes, docentes, directora

¹ Master with mention in Educational Management and teaching. **Correspondence:** edvasquez@ucvvirtual.edu.pe



y padres de familia. Gracias a la información obtenida como diagnóstico se tuvo el punto de partida para elaborar el modelo propuesto. La problemática observada fue que estudiantes y docentes presentaban limitaciones con respecto al pensamiento crítico y creativo, esto permitió desarrollar el modelo de indagación propuesto, que se validó mediante un juicio de expertos. Se concluyó que los estudiantes tenían un nivel bajo del desarrollo del pensamiento crítico y creativo, constituyéndose en un motivo más para diseñar el modelo.

PALAVRAS-CHAVE

estratégias,
investigação, modelo,
pensamento criativo,
pensamento crítico.

RESUMO. O objetivo desta pesquisa foi desenvolver um modelo de estratégias de investigação para o desenvolvimento do pensamento crítico e criativo em alunos da sexta série do ensino fundamental em Lajas, Chota (Peru). Participaram 23 alunos que compuseram a população e amostra do estudo. A pesquisa realizada é de tipo básico e nível descritivo proativo, com abordagem metodológica mista. Os instrumentos de coleta de dados foram elaborados com base nas variáveis do estudo com a escala Likert e foram aplicados a alunos, professores, diretora e pais. Graças às informações obtidas como diagnóstico, obteve-se o ponto de partida para a elaboração do modelo proposto. O problema observado foi que alunos e professores apresentavam limitações no que diz respeito ao pensamento crítico e criativo, o que possibilitou o desenvolvimento do modelo de investigação proposto, que foi validado por meio de julgamento de especialistas. Concluiu-se que os alunos tiveram um baixo nível de desenvolvimento do pensamento crítico e criativo, constituindo mais um motivo para projetar o modelo.

1. INTRODUCTION

Currently, research has been carried out on the brain's functioning with an emphasis on mental development and new ways of thinking. The concern of researchers and teachers has been to generate strategies that contribute to the development of necessary skills for the new generations and successfully face the demands of today's world. One of them is critical and creative thinking, which has become a primary need in the life of every human being. This cognitive ability allows us to have the ability to assume a critical and reflective posture in the face of everything that happens. Chávez and González (2019) affirm that a person who thinks critically is not easy to manipulate. They constantly reflect on everything they hear and thus obtain the truth or falsity of the facts.

At the African festival organized by the International Baccalaureate, Hughes (2020) pointed out that it is important to question all the information presented in the environment, with solid arguments, based on knowledge. That is, critical thinking is not generated in a vacuum. But must have quality learning and be in interaction with creative thinking.

Ochoa et al. (2018) consideraron que el pensamiento crítico que se instituye por medio de la indagación es una herramienta potencial para la toma de decisiones, el desarrollo integral, ruptura de brechas y creación de sociedades más equitativas. Se sugiere a líderes y docentes implementar programas educativos, y utilizar la indagación como habilidad pedagógica y didáctica.

Campirán (2019) carried out an analysis of critical thinking in Latin America, finding that in Mexico, it had already been included in the new educational model, on a mandatory basis and under four basic categories: argumentation, metacognition, emotions, and problem-solving.

In Peru, Alfaro (2018) assured that one of the goals for 2021 was to have citizens who make use of critical thinking regarding what they read and people who can produce original knowledge and share it.

In the Hualgayoc - Bambamarca Local Educational Management Unit (2017) , the local educational project was developed, in which the importance of critical and creative thinking stands out, including it within the strategic actions that are part of its work plan, to improve the quality of learning, reduce social gaps and to ensure a comprehensive education of students.

Currently, there is a significant concern worldwide about the development of critical and creative thinking, which is why governments and institutions seek to implement its development from the educational aspect.

Educational Institution No. 10432, where the research was carried out, is located in Lajas, province of Chota, Cajamarca region. It is a primary level institution, multi-teaching in the urban area.

From pedagogical practice, it was observed that the primary deficiency is the low level of development of critical and creative thinking of sixth-grade students. This problem manifests itself in difficulties in reasoning, understanding information, understanding instructions, arguing, and proposing solutions. In addition, they show little autonomy and limited participation in group work. Subsequently, an analysis of all these problems was carried out. Among the leading causes collected through an exploratory survey of teachers, it was determined that there is no clear idea of what critical and creative thinking means. As a result, there is difficulty developing learning sessions with appropriate strategies to strengthen this thought. The consequence of this problem is to have conformist people who passively accept everything, with little autonomy and little ability to deal adequately with the different situations that arise every day.

Among the factors involved in this study, food and health were considered. According to research, a poor diet produces a reprogramming of nerve cells in the brain, which alters neuronal circuits and affects their state, which are essential aspects that influence learning (Layé, 2020).

The Organization for Cooperation for Economic Development (2020) set out to develop critical and creative thinking as a significant objective, pointing out that it will be easy to acquire, practice, and externalize it if it is taught and evaluated. The United Nations Organization for Education, Science, and Culture (2017) also emphasizes the importance of developing higher-order skills that allow acting effectively in work. If the problem above is not resolved, it is impossible to contribute to achieving these objectives, resulting in conformist, dependent people with little decision-making.

For this reason, the research problem was formulated as follows: How is the model of inquiry strategies a factor that generates the development of critical and creative thinking in the students of the sixth grade of primary education of the educational institution 10432 of Lajas - Chota?

The general objective was to develop a model of strategies based on inquiry that contributes to critical and creative thinking in sixth-grade students of primary education at educational institution No. 10432 in Lajas. Among the specific objectives are indicated, determine the level of critical and creative thinking development through a test to students. Second, develop the model of inquiry strategies to develop critical and creative thinking. Third, validate the model of inquiry strategies for the development of critical and creative thinking through expert judgment.

Although many studies have sought to delve into this topic, its exploration is still insufficient, which is why it was possible to carry out this research and design a model of strategies based on the inquiry that allows its development. This study benefits the children of the sixth grade of the educational institution No. 10432 by developing their creative, critical capacity and at the same time contributing to other investigations to deepen this cognitive ability, and thus be able to enhance it from practice, improve actions pedagogical and achieve their transfer.

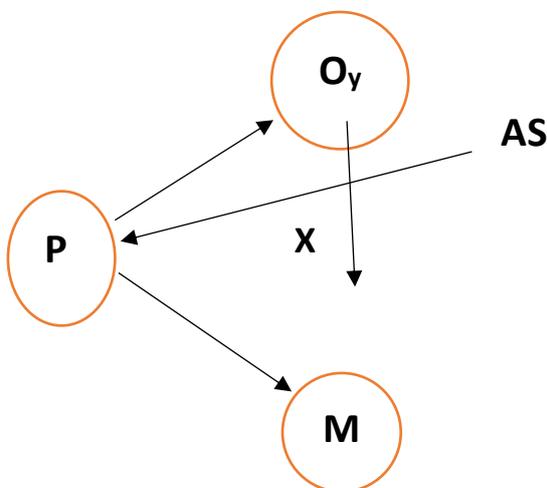
2. METHOD

According to the National Council for Science, Technology, and Innovation (2018) the research that was developed is essential. This means that it is aimed at complete knowledge thanks to interpreting the main aspects of the different events. Moreover, it is of a proactive level for designing a model of inquiry strategies to develop critical and creative thinking. According to Estela (2018), this type of research implies a reflection on scientific research and a precise location in its styles, levels or approaches.

The research carried out corresponded to a mixed-type methodological approach. That is, qualitative and quantitative methods were used Hernández and Mendoza (2018) indicate that this type of methodological approach adds complexity to research work. However, see the advantages of both systems and can reflect inductive and deductive thinking.

The design used in this research is called PCCMI (Critical and Creative Thinking through Inquiry), created by the researcher, represented by the following diagram:

Diagram 1
Critical and Creative Thinking through Inquiry



Where:

P : Study population

O_y : Diagnosis on the development of critical and creative thinking.

X : Inquiry strategies for the development of critical and creative thinking.

AS: Intervention of the intervening variable food and health.

M: Model of inquiry strategies for the development of critical and creative thinking.

Regarding the design, Rodríguez and Pérez (2017) point out that the researcher can propose a research design since it will allow him to more efficiently organize the sequence of procedures to be carried out during his study.

Among the study variables, we have the independent variable: inquiry, the dependent variable: critical and creative thinking, and the intervening variable: food and health.

The population in the present investigation was made up of 23 students of the sixth grade of primary education of the Educational Institution 10432 of Lajas between 11 and 13 years old. Cabrejos y Robles (2020) point out that a population is a set of people, objects, and events that will be the object of study for some researchers' interest.

Among the data collection techniques and instruments used were:

The observation as a technique was carried out through the test on critical and creative thinking applied to the students of the study sample; to consider the established dimensions. As Noreña (2020) points out, observation is the monitoring of activities and behaviors to collect necessary information in an investigation.

The interview technique was applied to the director of the educational institution through a specific guide with questions addressed to the study variables. Torres et al. (2019) point out that the interview is a data collection method that gives us subjective results from the mouth of the interviewee and serves to discover different points of view.

The survey technique was applied with the questionnaire's instrument, addressed to parents. It served to collect information on their children's nutritional and health status. Teachers also used it to manage their knowledge regarding critical and creative thinking, inquiry, and the impact and influence of their development in the classroom. Ferial et al. (2020) consider that the survey is one of the most used collecting information.

The validation was carried out through the judgment of experts, who were given the corresponding documentation. Based on the data received through the evaluation forms of the research instruments, Aiken's V was applied. As a result, an assessment of 0.98 was obtained, which indicates that the agency can be used. In this regard Hernández et al. (2014) point out that an investigation presents internal and external validity. The first has to do with confidence in the results. External validity refers to how the results of an experiment can be generalized to other situations.

For the reliability of the research instruments, a pilot test was applied, with ten subjects who did not belong to the research group, the data was processed, and Cronbach's Alpha was applied. As a result, an assessment of 0.979 was obtained, which meant that the instrument had high reliability. Therefore, the test is a reliable instrument for its application. Hernández et al. (2014) maintain that the reliability of a device refers to the degree of repetition of results between individuals that are statistically verified.

The SPSSv26 program was used for the quantitative approach instruments for the statistical analysis of the data obtained. The corresponding tables and figures have been derived, with results at the central tendency, dispersion, and inferential measures. Based on them, the related analysis was carried out. The researcher analyzed and interpreted the information collected with the interview guide questionnaire to teachers.

When carrying out the research, the application of the code of ethics of the César Vallejo University (2020) was considered, and the integrity of the information presented was maintained, the intellectual property of each of the authors was respected. It was taken into account (art. 10) for this, the bibliographic sources consulted were cited and referenced through the APA standards the seventh edition.

3. RESULTS

Results on the level of development of critical thinking

Results on dimensions

In figure 1 attached, we can see that the least representative dimensions regarding critical thinking are problem-solving and metacognition; they present average scores of 2.09 and 0.48, respectively, and are below the general average (2.8). These results lead to seeking strategies to strengthen students' resolution.

Figure 1

Average score in the dimensions of Critical Thinking in students of the IE 10432 of Lajas, Chota 2021

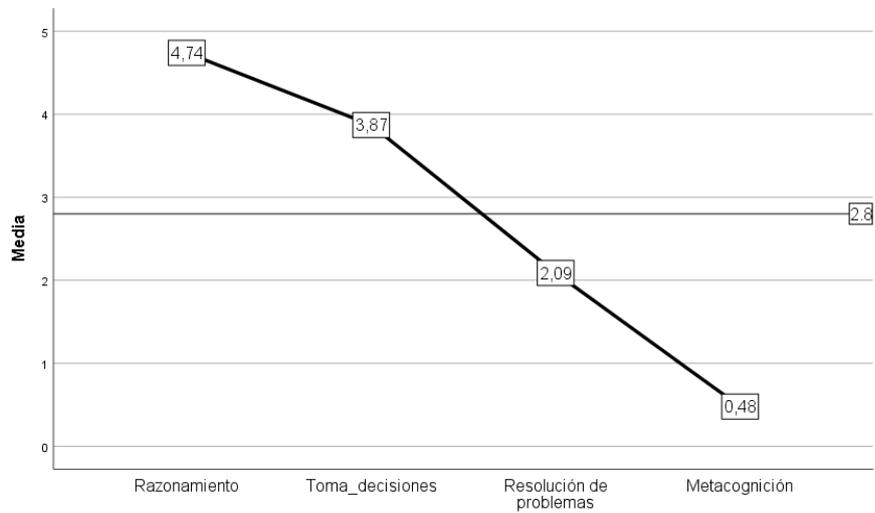
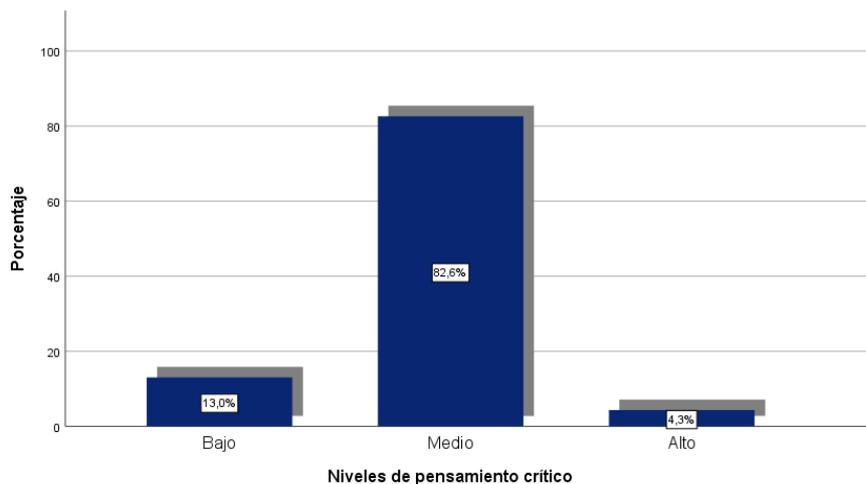


Figure 2 clearly shows a more significant number of students at an average level of critical thinking; this is 82.6% (19) concerning the total. On the other hand, 13.0% (3) present a low level and only 4.3% (1) a high level.

Figure 2

Levels of critical thinking in students of the IE 10432 of Lajas, Chota 2021



Results on the level of development of creative thinking

Results on dimensions

Edith Vásquez



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In figure 3, we can see that the least representative dimensions regarding creative thinking are preparation and incubation. They represent average scores of 2.35 and 2.04, respectively, and are below the general average (3.01). Undoubtedly, the results support the importance of developing strategies to strengthen students' dimensions that were not representative.

Figure 3

The average score in the dimensions of the creative thinking dimension in students of the IE 10432 of Lajas, Chota 2021

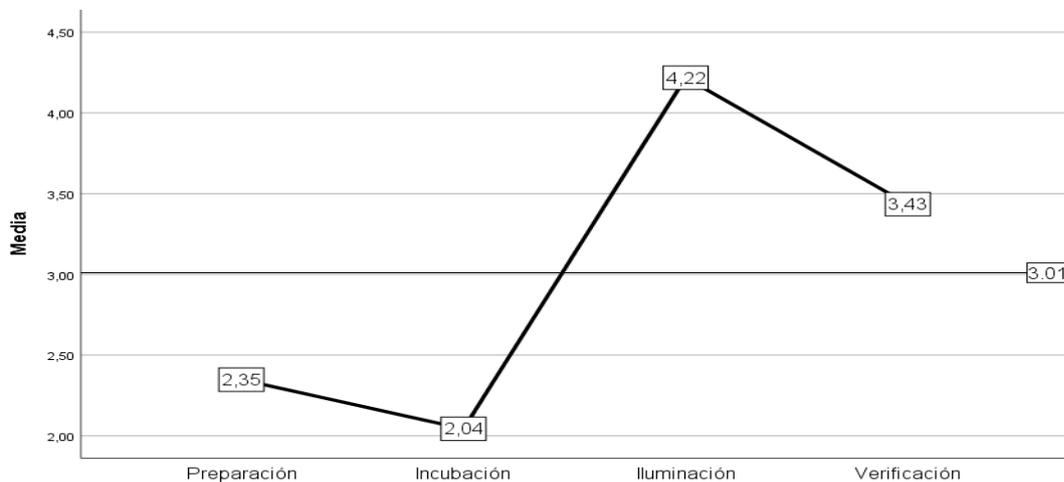
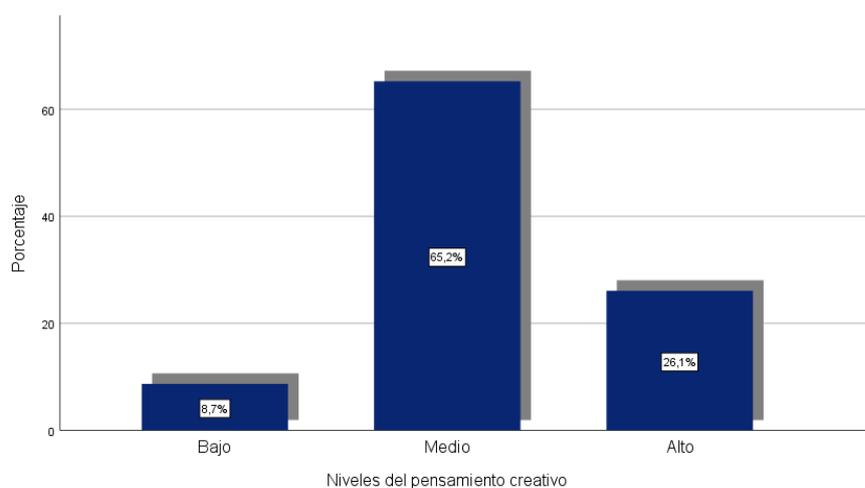


Figure 4 shows that the most significant number of students of the Educational Institution No. 10432 of Lajas, Chota, present a medium level in the creative thinking dimension, which represents 65.2% (15) concerning the total of the sample, the 26.1% (6) present a high level and only 8.7% (2) reached a low level.

Figure 4

Levels of creative thinking in students of the IE 10432 of Lajas, Chota 2021



Results on the level of development of critical and creative thinking:

Figure 5 allows us to see that the problem solving, metacognition, preparation, and incubation dimensions are aspects that must be strengthened through coping strategies, given that they present averages of 2.09, 0.48, 2.35, and 2, 04, respectively, and are below the general standard of 2.90.

Figure 5

Average in the dimensions of critical and creative thinking in students of the IE 10432 of Lajas, Chota 2021

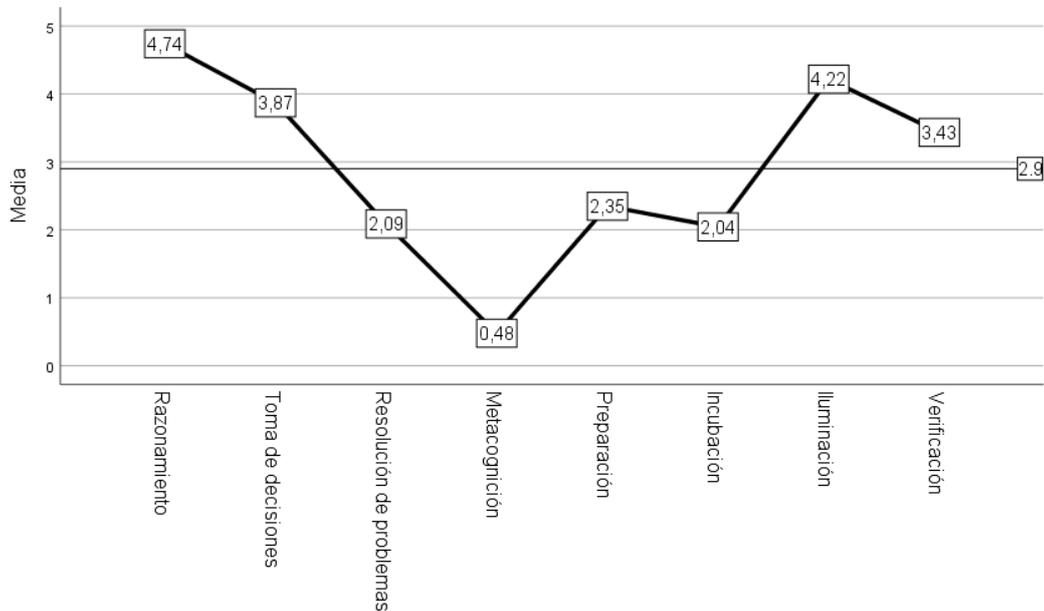
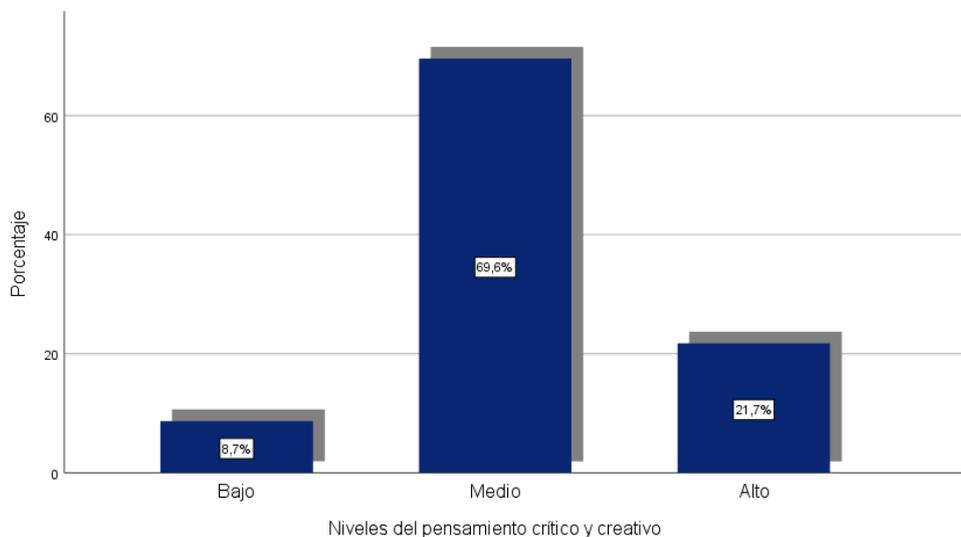


Figure No. 6 clearly shows us a more significant number of students who present an average of critical and creative thinking; 69.6% (16) concerning the total. On the other hand, 21.7% (5) gave a high level, and 8.7% (2) showed a low.

Figure 6

Levels of critical and creative thinking in students of the IE 10432 of Lajas, Chota 2021



In table 1, we can see that in men, the average scores of critical and creative thinking present very little difference concerning women, that is, 24.08 and 22.10, respectively. The same occurs with the median value, 25 and 21.50, for both groups. Respectively. Because these numerical values have minimal differences, we cannot say statistically differentiable. Therefore, it should be noted that critical and creative thinking at a general level is the same in men as in women. On the other hand, the same occurs independently for each dimension.

Table 1

Mean and median of the general score of critical and creative thinking, dimensions of critical thinking and creative thinking, by sex.

Sex	Descriptive measure	Overall critical and creative thinking score	Critical thinking dimension score	Creative thinking dimension score
Woman	Half	22.10	10.90	11.20
	Median	21.50	10.50	11.50
	N	10	10	10
Man	Half	24.08	11.38	12.69
	Median	25.00	12.00	13.00
	N	13	13	13

Note. Test results.

4. DISCUSSION

Developing the model of inquiry strategies for developing critical and creative thinking in primary school students has started from the identification of the complex reality. The information collection was carried out through the test to the students and covered all the dimensions of the variables raised. The selected strategies that encompass planning, development, and evaluation processes were organized. These will be applied in the different methodology phases for projects based on inquiry and when preparing the various learning sessions. This model proposal was approved through expert judgment. Validation was performed using Aiken's V, where the 95% confidence level was demonstrated, deducing that the proposal was suitable for its application.

The proposal has been prepared to consider one of the conclusions reached (Ochoa et al., 2018). This indicates that leaders and teachers must implement educational programs using inquiry to develop one of the most necessary cognitive abilities in recent times. Likewise, as Hång (2020) mentions, critical and creative thinking is crucial in current education as it will allow acting effectively in the world of work (UNESCO, 2017).

The data collection was carried out, and among the results obtained, it was possible to determine that more than 85% of the students are in the medium and low level of critical thinking. This is not an acceptable level, as it indicates that students are learning. However, they cannot achieve the ultimate goal of generating knowledge. The weakest dimensions were problem-solving and metacognition because the learning is not quality. This is indicated by Hughes (2020), and if it were that way, the student could question the environment much more and actively participate in it.

When evaluating creative thinking, it was found that the variables of preparation and incubation are the ones that appear at the lowest level in the students. It was thus shown that they are not capable of attending to the environment's needs and determining which are the problematic situations that require attention. Therefore, more than 73% of the students are at a medium and low level, which is unacceptable. This shows that there is still a lot to work on. They must process information, form knowledge, combine it with all mental resources, and systematize it creatively; this will improve their critical capacity (Villarini, 2016).

Evaluating critical and creative thinking as a much more complex cognitive ability should be included in educational projects (Alfaro, 2018). It was found that almost 80% had a medium and low level of critical thinking. This allows us to understand that there is still much work to be done. It was determined that the weakest dimensions are metacognition and incubation. All this implies that the student still has difficulties evaluating the environment and looking for problematic situations that must be solved. It was also possible to determine that the dimensions with the highest level are reasoning and enlightenment. It was evidenced that the cognitive level (informative and memorization) has a lot of influence, likewise, the establishment of alternative solutions to an already established problem.

It is sought through this research work and the proposed model that students can generate ideas. They must start the inquiry process to develop critical and creative thinking. This will favor better development in their daily life and the work environment.

An interview was also conducted with teachers, and it was possible to see that, as indicated by Salazar and Cabrera (2020), teachers and students have difficulties developing critical thinking. This information was shown in the answers provided in each formulated item. The teachers responded according to the planning, execution, and evaluation of the different variables' different dimensions. 60% indicated that they sometimes included these cognitive skills in their planning, while 40% did not. It was mentioned that sometimes they did consider these capacities in the execution. They also indicated that they integrated the different sessions through questions and answers. They consider critical and creative thinking as a capacity for reasoning but not reflection and preliminary investigation. This type of thinking allows us to argue more thoughtfully to make decisions and solve problems. Finally, in the evaluation process, it was shown that, although some teachers indicated that they did it, they did not know the correct way to evaluate this competence specifically.

The proposal of the established model represents a contribution to the educational field. The design that has been structured is based on inquiry strategies as the ideal tool for the development of critical and creative thinking. In addition, it contributes with theoretical aspects to support the proposal, techniques, procedures.

These can be applied systematically from planning, execution, and evaluation, essential elements of the learning process.

The director was interviewed to determine her role in the effective management of its implementation, from the management instruments to its application in the classroom. She indicated that it includes critical and creative thinking and inquiry in planning, implementing, and evaluating them. Still, when contrasting this information with the ten teachers surveyed, 50% indicate that it has never been worked on. The other 50% suggest that sometimes they have carried out some activities together. Thus, it was concluded that the work on these variables is limited.

Finally, a questionnaire was made to the parents to know their children's nutrition and health situation. They indicated that the children ate healthy at home and received support sporadically from health facilities. However, it was mentioned that they did not have extensive knowledge of its application and that they still need to become aware of the importance of these topics. However, they considered that this information still needs to be reinforced to make it a habit.

There were some limitations in this research process. The low availability of educational institutions to carry out research is due to saturation with virtual classes. In the same way, the resistance of some teachers in their participation, since they did not attend permanently to work and the instrument had to be applied at different times. Another significant barrier was having to comply with the protocols established by the pandemic; Covid-19 did not allow many students to gather together, and therefore, they had to be divided into small groups to take care of their health. In addition, for the development of this report, different new technological tools had to be used that were still uncommon in use, which somewhat delayed several of the activities to be carried out.

Despite the difficulties presented, the proposal of an established model was elaborated. This will support teaching planning and the development of learning sessions, with the students of the educational institution where the research was carried out being direct beneficiaries. It will also benefit the community in general with critical and creative subjects who can provide solutions to the problems of reality. This contributes to a better quality of life. As mentioned by Verawati et al. (2020), the inquiry promotes critical and creative thinking so that students increase their critical-analytical capacity and can apply it in their daily lives.

The search for information was carried out in different data sources in this process. Still, the strategies proposed by Gálvez (2001) for development were considered; among these are the formulation of researchable questions, the V Gowin, the documentary analysis, critical reading, fieldwork, and the science fair, although depending on the applied sessions you can apply many more. The model is structured based on 4 phases. These are broken down into learning sessions that include using the strategies described above according to the learning moments; that, after being validated, can be considered for your application.

All of the above confirms the hypothesis, that is, the model of inquiry strategies developed is an effective tool that, when applied, will improve the development of critical and creative thinking of primary school students of educational institution No. 10432 de Lajas - Chota, thus fulfilling the main objective of this research work.

5. CONCLUSIONS

A model of inquiry strategies was developed to contribute to the critical and creative thinking of the students of the sixth grade of primary education of the educational institution No. 10432 of Lajas, 2021. The most important thing was establishing a methodological process with relevant theoretical aspects. To make it easier to apply. What helped generate this methodology was the information obtained because it served as the basis for its development. The most challenging thing was to establish the sequence by having to interrelate aspects such as planning, development, and evaluation strategies, considering the less favored dimensions, and at the same time addressing all this with an interdisciplinary perspective.

It was possible to establish the level of development of the critical and creative thinking of the sixth grade of primary education students, obtaining low levels as results, mainly in the dimensions of problem-solving, metacognition, critical thinking, and preparation and incubation of creative thinking. These data obtained served as a diagnostic base for the elaboration of the model and to have clarity of the aspects in which it is necessary to intervene to develop these types of thought.

The relevant information found as theories, fundamentals, principles, support of the proposal was systematized and thus organized the model of inquiry strategies to develop critical and creative thinking.

The proposed model of inquiry strategies designed for the development of critical and creative thinking was validated through expert judgment.

Future researchers are suggested to implement similar educational models and compare the results from their application. They can also develop new models representing the starting point for further research projects.

Conflicto de intereses / Competing interests:

La autora declara que no incurre en conflictos de intereses.

Rol de los autores / Authors Roles:

No aplica.

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Aspectos éticos / legales; Ethics / legals:

La autora declara no haber incurrido en aspectos antiéticos, ni haber omitido aspectos legales en la realización de la investigación.

REFERENCES

- Alfaro, D. (2018). Minedu: “queremos ciudadanos con pensamiento crítico respecto a lo que leen”. *Andina*. <https://bit.ly/3MKQPAb>
- Campirán, A. (2019). El Pensamiento crítico más allá de las disciplinas. *IV Seminario Internacional de*

- Pensamiento Crítico (21-25 de octubre)*, 31-32. <https://www.pensamiento-critico.com/archivos/progratrabajosIVsemiPC.pdf>
- Chávez, B., & González, M. (2019). Creatividad y habilidades de pensamiento: Programa de enriquecimiento para niños con bajo rendimiento intelectual. *Revista Iberoamericana de Psicología*, 13(1), 163-175. <https://doi.org/10.33881/2027-1786.rip.13115>
- Consejo Nacional de Ciencia Tecnología e innovación. (2018). *Resolución de presidencia N° 214 -2018-concytec-p*. <http://resoluciones.concytec.gob.pe/reporte/reporte.php>
- Estela, R. (2018). *Modelo meta discursivo para mejorar la competencia argumentativa oral en estudiantes de segundo ciclo de educación superior, Trujillo* [Universidad Privada Antenor Orrego]. <https://bit.ly/3l5PyQx>
- Feria, H., Matilla, M., & Mantecón, S. (2020). La entrevista y la encuesta: ¿Métodos o técnicas de indagación empírica? *Didasc@lia: Didáctica y Educación*, 11(3), 62-79. <http://revistas.ult.edu.cu/index.php/didascalía/article/view/992>
- Gálvez, J. (2001). *Métodos y técnicas de aprendizaje : teoría y práctica* (4a ed.). Trujillo Gráfica Norte.
- Hernández, R., Fernández, C., & Baptista, P. (2014). *Metodología de la investigación*. Mc Graw Hill.
- Hernández, R., & Mendoza, C. (2018). *Metodología de la investigación: las rutas cuantitativa, cualitativa y mixta*. Mc Graw Hill Education. <https://virtual.cuautitlan.unam.mx/rudics/?p=2612>
- Hughes, C. (2020). *La importancia del pensamiento crítico en el siglo XXI*. <https://bit.ly/3q3qluu>
- Layé, S. (2020). Método Vitalidad y Figura. En *Nuestro cuerpo es lo que comemos*.
- Noreña, D. (2020). *Diccionario de investigación*. Universidad de Lima, Escuela de Posgrado. <https://hdl.handle.net/20.500.12724/10889>
- Ochoa, L., Valenzuela, A., Gallego, D., Márquez, F., Govea, D., Valderrama, K., & Cano, L. (2018). *La indagación como estrategia para la educación STEAM*. https://recursos.educoas.org/sites/default/files/Final_OEA_Indagación.pdf
- Organización de Cooperación para el Desarrollo Económico. (2020). *Manual de la OCDE sobre Integridad Pública*. <https://www.oecd.org/publications/manual-de-la-ocde-sobre-integridad-publica-8a2fac21-es.htm>
- Organización de las Naciones Unidas para la Educación la Ciencia y la Cultura. (2017). *Desglosar el objetivo de desarrollo sostenible 4 educación 2030. Objetivos de desarrollo sostenible*.
- Rodríguez, A., & Pérez, A. (2017). Métodos científicos de indagación y de construcción del conocimiento. *Revista Escuela de Administración de Negocios*, 82, 175-195. <https://doi.org/10.21158/01208160.n82.2017.1647>
- Salazar, D., & Cabrera, X. (2020). Estrategia didáctica para fortalecer el pensamiento crítico en estudiantes de tercer grado de primaria en Institución Educativa de Chiclayo. *Tzhoecoen*, 12(1), 1-9. <https://doi.org/10.26495/tzh.v12i1.1240>

Torres, M., Paz, K., & Salazar, F. (2019). *Métodos de recolección de datos para una investigación*.

Unidad de Gestión Educativa Local Hualgayoc – Bambamarca. (2017). *Proyecto educativo local de la Provincia de Hualgayoc 2017 - 2021*. <https://es.readkong.com/page/proyecto-educativo-local-de-la-provincia-de-hualgayoc-1576532>

Universidad César Vallejo. (2020). *Código de ética en investigación*.

Verawati, N. N., Hikmawati, H., & Prayogi, S. (2020). The effectiveness of inquiry learning models intervened by reflective processes to promote critical thinking ability in terms of cognitive style. *International Journal of Emerging Technologies in Learning (IJET)*, 15(16), 212. <https://doi.org/10.3991/ijet.v15i16.14687>

Villarini, A. (2016). Teoría y pedagogía del pensamiento crítico. *Perspectivas Psicológicas*, 3-4(4), 35-42. <https://fhcevirtual.umsa.bo/btecavirtual/?q=Teoría y pedagogía del pensamiento critico>