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## Original article

# Neurodidactic strategy for the development of reading comprehension skills in basic education

## Estrategia neurodidáctica para el desarrollo de la habilidad comprensión lectora en la educación básica

## Estratégia neurodidática para o desenvolvimento de habilidades de compreensão de leitura na educação básica

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## ABSTRACT

Reading comprehension is a skill that a reader acquires in stages of development by processing, evaluating, and applying information extracted from a text. Eighth-year students of the Upper Basic sublevel of the "Alfonso María Borrero" General Basic Education School require this skill to function in any area of their life. The objective of this article is to propose a neurodidactic strategy for the development of the reading comprehension skill at the literal, inferential, and critical-evaluative levels as part of the teaching-learning process of the Language and Literature subject. From the perspective of the mixed research approach, theoretical, empirical, and statistical-mathematical methods were used for information processing. The work group consisted of a total of 22 students. The main result of the study is a neurodidactic strategy for the development of reading comprehension skills, which is characterized by the articulation of neurodidactic approaches, criteria and modalities, which lead to varied activities, which dynamics are revealed in a typology of texts, enriched by resources and supports. In the consultation of specialists and the systematization of experiences, it is noted that it favors cognitive and affective-motivational processes. In addition, decoding, response to implicit situations, as well as the deduction of explicit ideas and the evaluation of content, in order to issue judgments considering the accuracy, probability and acceptability of each participating reader.

**Keywords:** reading comprehension; neurodidactic strategy; skill.

**RESUMEN**

La comprensión lectora es una habilidad en grados de desarrollo que obtiene un lector al procesar, evaluar y aplicar información extraída de un texto. Los estudiantes de octavo año del subnivel de Básica Superior de la Escuela de Educación General Básica "Alfonso María Borrero", requieren de esta habilidad para desenvolverse en cualquier ámbito de su vida. El presente artículo tiene como objetivo proponer una estrategia neurodidáctica para el desarrollo de la habilidad comprensión lectora en los niveles literal, inferencial y crítico valorativo como parte del proceso de enseñanza-aprendizaje de la asignatura Lengua y Literatura. Desde la perspectiva del enfoque mixto de investigación se utilizaron métodos teóricos, empíricos y estadístico-matemáticos, para el procesamiento de la información. El grupo de trabajo estuvo conformado por un total de 22 estudiantes. El principal resultado del estudio realizado lo constituye una estrategia neurodidáctica para el desarrollo de la habilidad comprensión lectora, la cual se caracteriza por la articulación de enfoques, criterios y modalidades neurodidácticas, que derivan hacia actividades variadas, cuya dinámica se revela en una tipología de textos, enriquecidas por recursos y apoyos. En la consulta de especialistas y la sistematización de experiencias, se constata que favorece los procesos cognoscitivos y afectivo-motivacionales. Además, la decodificación, respuesta a situaciones implícitas, así como la deducción de ideas explícitas y la evaluación del contenido, con el fin de emitir juicios considerando la exactitud, probabilidad y aceptabilidad de cada lector participante.

**Palabras clave:** comprensión lectora; estrategia neurodidáctica; habilidad.

**RESUMO**

A compreensão de leitura é uma habilidade em graus de desenvolvimento que o leitor obtém ao processar, avaliar e aplicar informações extraídas de um texto. Os alunos do oitavo ano

do subnível Básico Superior da Escola de Educação Geral Básica "Alfonso María Borrero" necessitam desta habilidade para atuar em qualquer área de sua vida. O objetivo deste artigo é propor uma estratégia neurodidática para o desenvolvimento de habilidades de compreensão leitora nos níveis literal, inferencial e avaliativo crítico como parte do processo de ensino-aprendizagem da disciplina Língua e Literatura. Na perspectiva da abordagem mista de pesquisa, foram utilizados métodos teóricos, empíricos e estatístico-matemáticos para o processamento das informações. O grupo de trabalho foi composto por um total de 22 alunos. O principal resultado do estudo realizado constitui uma estratégia neurodidática para o desenvolvimento da habilidade de compreensão leitora, que se caracteriza pela articulação de abordagens, critérios e modalidades neurodidáticas, que conduzem a atividades variadas, cuja dinâmica se revela numa tipologia de textos, enriquecido por recursos e apoio. Na consulta a especialistas e na sistematização de experiências, confirma-se que favorece processos cognitivos e afetivo-motivacionais. Além disso, a decodificação, a resposta a situações implícitas, bem como a dedução de ideias explícitas e a avaliação do conteúdo, a fim de fazer julgamentos considerando a precisão, a probabilidade e a aceitabilidade de cada leitor participante.

**Palavras-chave:** compreensão leitora; estratégia neurodidática; habilidade.

**INTRODUCTION**

The reading comprehension skill is present in the different areas in which human beings develop from the moment they know the first letters and goes through the formulation of words with their meanings. During life, various skills are acquired that originate complex mental processes and require stimuli to achieve full understanding.

The study carried out by Armijos, Paucar and Quintero (2023) reveals trends and limitations in the development of reading comprehension in several Latin American countries, including Ecuador, and highlights the relationship among reading comprehension, its levels, strategies for its improvement and the use of information and communication technologies in the educational context. It also points out the existence of cases in which the use of less innovative strategies, which, being focused on typical extensive reading methodologies, tend to lead to boredom, excessive memorization and disinterest, which reflects the insufficient consideration of motivational indicators.

It is worth reflecting on the decrease in the development of reading strategies and its effect on the understanding and management of more complex skills, which indicates that in the Ecuadorian context there is a contradiction between the high expectations expressed in the national curriculum, in accordance with what is stipulated in the learning standards from the initial level to high school and the insufficient results in international tests such as PISA and ERCE, which demonstrate the existence of gaps in the quality of learning, as well as the need to expand the opportunities of each student in the region in relation to the development of these skills (National Institute of Educational Research, 2019).

This research is coherent with the need of contributing to the achievement of these standards through a study in the eighth year of Basic General Education, which serves as a link between the end of the basic middle sub-level and the beginning of the basic upper sub-level, where failures and difficulties are reflected that have their genesis in the insufficient didactic treatment of the reading comprehension skill. The action deployed by Llaque (2022) reflects that students need the application of active methodologies and strategies to achieve the development of reading skills, which must go through three levels: literal, inferential and critical-evaluative.

These levels are further explored by Misari (2023), pointing out that at the literal level the reader "identifies the explicit ideas of the text", at the inferential level he must be able to "give general meaning to what he reads and to identify the particularities of the text to interpret, to establish conjectures and to deduce the implicit or unknown ideas of the subject" and at the critical level "comparisons and solutions are made and he must be able to propose his own ideas in a logical and critical manner" (p. 539).

The theoretical review of possible solutions to the needs that arise in the order of the development of the reading comprehension skill, allows us to delve into the construct of neurodidactic strategy, which is treated in the scientific literature and, taking into account its importance, in the present work, reference is made to its conception and structure is made. The proposal made by Ocampo (2019) is assumed, which contemplates three modalities: operational (O), methodological (ME) and socio-emotional (SO). In this article, the acronym OMESO is used to designate this design of neurodidactic sequences that include activities for brain development and functioning, taking into account a certain logical order.

Nowadays, the teaching-learning process is assessed from neuroscientific perspectives, therefore the analysis of how the brain processes involved in reading can influence on the design of effective educational interventions to meet the needs of students, implies addressing the way of doing didactics based on the knowledge of neuroscience, from the neurodidactic discipline or didactics of neuroscience, with emphasis on the exploration of the diversity of learning styles and cognitive profiles for the design of personalized and collaborative didactic actions.

The establishment of concrete relationships between brain functions and the teaching-learning procedures of reading comprehension in classrooms has important national references in González, Núñez and Guaraca (2021), who demonstrated that it is possible to maximize the interest of students to achieve learning, with

emphasis on their motivation and metamotivation. Meanwhile, the studies by Briones and Benavides (2021) refer to its importance in significantly enhancing reading comprehension skills at different educational levels.

The logic followed in the researching process, as well as the analysis of the conceptual and operational elements that are assumed as a guiding basis for the methodological action in carrying out the necessary inquiries about the situation that occurs at the "Alfonso María Borrero" General Basic Education School of the Inter-Andean Region, Azuay Province, Cuenca Canton, in the rural sector of the Santa Ana parish, allow us to delve into the problem related to how to develop the reading comprehension skill in the teaching-learning process of Language and Literature in the eighth year students of that school.

Therefore, the objective is to propose a neurodidactic strategy for the development of reading comprehension skills at the literal, inferential and critical-evaluative levels as part of the teaching-learning process of the subject of Language and Literature.

## MATERIALS AND METHODS

The study was carried out at the "Alfonso María Borrero" General Basic Education School, in Ecuador, with a group of 8th year students of General Basic Education. The research was applied in the period 2022-2023, with the participation of 22 students, 11 of them women and 11 men, and 1 Language and Literature teacher.

The selection of research methods was based on different criteria, including the research approach, type of study, the problem being addressed, the research objectives, resources, subjects and contexts of action, ethical conditions for carrying out the research and the time for its development.

The research approach assumed is mixed, which requires the use of theoretical and empirical level methods, which will allow combining, integrating and triangulating relevant and necessary information obtained at each moment of the development of the study.

Different methods of the theoretical level were used, among which the following stand out: analysis-synthesis, induction-deduction, systemic approach, as well as methods of the empirical level, such as:

- Observation: It was carried out with the aim of knowing how the levels of reading comprehension acquired by students in Language and Literature classes are manifested.
- Document analysis: aimed at assessing students' failures and successes in carrying out activities related to reading comprehension levels.
- Survey: addressed to students to determine their level of satisfaction regarding the development of activities related to reading comprehension skills.
- Interview with the Language and Literature teacher: to investigate his/her criteria regarding the limitations, possibilities and potential provided by the development of neurodidactic strategies focused on the development of reading comprehension skills.
- Pedagogical test: applied to the group of students to analyze the levels of reading comprehension that were worked on as part of the implementation of the neurodidactic strategy.
- Expert panel: applied to professionals with expertise in the subject that is valued for the recording and processing of the opinions, criteria and recommendations of the specialists to reach consensus and to make decisions based on their knowledge, experience and in relation to the modeling of the neurodidactic strategy.
- Systematization of experiences: aimed at implementing the actions of the neurodidactic strategy in working

sessions where the role of the teacher and the students in relation to the development of the reading comprehension skill is appreciated.

## RESULTS

In the development of the research, three phases were planned, in order to approach the state of development of the reading comprehension skill and to propose a solution to the needs detected. The study included the exploration of the literal, inferential and critical-evaluative levels as part of the teaching-learning process of the Language and Literature subject in the 8th year students of General Basic Education at the "Alfonso María Borrero" school.

The main results achieved in each of the planned phases are described below.

### Phase 1: Diagnosis of reading comprehension levels in students

This phase aims to diagnose the current state of reading comprehension levels in students and for this purpose different research methods and techniques were applied, where the following results were obtained.

In the classroom observation carried out in five classes taught by the teacher who is part of the sample, who was observed in one class of new content, three of generalization and one of practice, generally following the didactic aspects object of study. Table 1 shows the general results obtained in the qualitative evaluation of each indicator observed and which contribute, in one way or another, to the development of the levels of reading comprehension in the classes of the area of Language and Literature of the 8th year of General Basic Education.

**Table 1-** Distribution of evaluation categories and indicators in classroom observation

Observation indicators	C1	C2	C3	C4	C5
Orientation of the class topic according to the content (orientation and motivation)	B	B	B	B	B
Methods and resources used	R	B	B	B	R
Strategies used to stimulate cognitive and affective-motivational processes	R	R	B	B	R
Student Participation	B	B	B	B	B
Use of teaching aids	R	B	B	B	B
How reading comprehension levels are constructed and assessed	R	B	R	R	B
Classroom environment	B	B	B	MB	MB

Legend: C (Class), D (Poor), R (Fair), B (Good), MB (Very good)

Source: Own elaboration

Due to its characteristics, class No. 1 of new content is exemplified, which began with the activity of motivation and exploration of prior knowledge, continued with the phase of knowledge construction, the materials used were printouts of didactic activities related to the topic: logical connectors. At the end, the learning related to the levels of reading comprehension is not built in the determined time. It is necessary for the teacher to specify actions to stimulate curiosity and make the necessary anchors with the new content.

It is concluded that the teacher partially developed the stimulation of critical thinking, brain functions and reading comprehension at the three levels, which is equivalent to average. The students had an acceptable level of participation if one takes into account that there was a predominance of questions at the reproductive level.

The most affected indicators are the strategies for stimulating cognitive and affective-motivational processes, the way in which learning related to reading comprehension levels is constructed and evaluated, and the use of teaching methods and resources. It is assessed

that most of the observable indicators in the class were evaluated as good, followed by regular and very good. No indicator was evaluated as poor. This could indicate a performance closer to the good criterion in meeting the objectives in the class in general, although quality is affected by the regular categories, which implies assuming new goals in relation to the establishment of good practices for the development of the reading comprehension skill, strengthening the activation of these processes.

The documentary analysis included the review of the 22 students' worksheets, which corroborated the teacher's criteria and evaluation, in relation to the methodology and strategies applied. A range of 10 activities based on readings was reviewed. In four of them, the greatest incidence was at the literal level with 100% adequate resolution. In one of the readings, exercises at the literal and inferential levels are applied, and only in four of them the three levels are articulated. With respect to the answers given by the students, a tendency towards high academic performance is observed in five students, representing 22.7%.

In the survey applied to the 22 students who are part of the sample, aspects related to the love for reading, understanding of the content, interest in playful learning, among others, were explored. It was found that 36 % showed interest in reading at least one hour a week, while the remaining 64% do not find this activity enjoyable. Despite the implementation of the reading promotion program and the "Juntos Leemos" program developed by the Ministry of Education of the Republic of Ecuador, it is evident that the time dedicated to reading is minimal. (MINEDUC, 2024).

It was found that 77% of the students had a solid understanding of the explicit elements in the text and 23% did not understand everything related to the field of communication. The importance of understanding what they read is part of the pleasure of reading, regardless of the type of text, and in this sense it is noted that 41% of the

students have a low level when issuing criteria in relation to the content of the reading.

Regarding playful learning, 82% have a high level and 18% a low level. It is interesting to know that students express that the teaching-learning process is thought through new forms and strategies that motivate them.

The interview with the teacher who teaches the subject of Language and Literature focused on the search for information about how activities for the development of reading comprehension skills are analyzed, planned and executed. The criteria obtained reveal the minimum and maximum levels referred to by the teacher regarding the state of each of the indicators evaluated in his students, with the interest in reading being quite low, since he considers that 83% of his students are at this level.

When assessing the state of mastery of the levels of reading comprehension, the literal level is considered to have the highest results with 90%, to the detriment of the inferential and critical-evaluative levels with 41% and 18% respectively. It is appreciated that the teacher shows a willingness to transform educational reality and critically assesses his teaching practice, also revealing his limited information on neurodidactics and the use of tools that can be used in the implementation of strategies of this type.

The study involved the application of a pedagogical test composed of 16 indicators classified into three levels of reading comprehension and aimed at assessing the quality of the distribution of the answers given by the students. A value of 1 (fi) was taken for adequate answers and a value of 2 (fi) for inadequate answers (Table 2).

**Table 2-** Results of the pedagogical test

<b>Indicators</b>	<b>1</b>	<b>fi</b>	<b>2</b>	<b>fi</b>
<b>Literal Level</b>	<b>%</b>	<b>#</b>	<b>%</b>	<b>#</b>
Identifies the main idea of the text.	23	5	77	17
Identifies relevant texts.	68	15	32	7
Orders a text sequentially.	55	12	45	10
Identifies the text-illustration relationship.	91	20	9	2
Identifies explicit information in the text.	32	7	68	15
Average	53.8%		46.2%	
<b>Inferential level</b>	<b>%</b>	<b>#</b>	<b>%</b>	<b>#</b>
identifies the type of text.	86	19	14	3
Decodes words according to context.	91	20	9	2
Deduces causes of a fact.	64	14	36	8
Recognizes implicit information in the text.	59	13	41	9
Deduces implicit information.	77	17	23	5
Deduces the communicative intention.	18	4	82	18
Average	65.83%		34.16%	
<b>Critical Evaluative Level</b>	<b>%</b>	<b>#</b>	<b>%</b>	<b>#</b>
Applies the content of the text to other situations in his/her life.	91	20	9	2
Evaluates the content of the text and explains his/her answer.	23	5	77	17
Involves his/her emotions in relation to the text.	55	12	45	10
Evaluates his/her possible decisions based on the content of the text.	59	13	41	9
Clearly argues the answers according to your criteria.	55	12	45	10
Average	56.6%		43.4%	
Total	59.18%		41.25%	

Source: Own elaboration

The results obtained in the pedagogical test show that 46.2% of the students were unable to adequately answer the statements related to the literal level, while 34.16% had difficulties at the inferential level and 43.4% were unable to carry out a concrete analysis to achieve the critical-evaluative level. Therefore, 41.25% of the

students require that the three levels of reading comprehension be strengthened: literal, inferential and critical-evaluative.

The comprehensive analysis of the results shows limitations in students, since it is not always easy for them to understand texts. Therefore, according to the situations described, several mental processes need to be put into operation, which always need to be developed to make the best decisions. This allows us to understand that, to achieve reading comprehension, higher cognitive processes intervene and these are supported by lower cognitive processes, which corroborates the importance of moving through the different levels of reading comprehension.

With the results obtained, a neurodidactic strategy was designed, which contains different activities to strengthen the reading comprehension skill, which is structured in two essential components and will be presented in the next phase.

### **Phase 2: Neurodidactic strategy to strengthen reading comprehension skills**

The strategy is neurodidactic and its organizational structure articulates components, stages and actions that are deployed sequentially. The study developed by Rodríguez (2023) corroborates that "neurodidactics has allowed the development of new techniques and methodologies that adapt to the individual needs of students" (p. 120), which demonstrates the importance of applying a neurodidactic strategy that strengthens the reading habit and enables the development of reading comprehension at the literal, inferential and critical-evaluative levels.

It focuses on the development of brain competencies and the improvement of neurofunctional functions through the development of reading comprehension skills, deploying actions towards the theoretical-methodological and dynamic-operational components, which direct the actions within the integral functioning of the strategy.

The theoretical-methodological component is characterized by harmoniously integrating the bases of the neurodidactic strategy, with emphasis on its theoretical-methodological bases where neuroscientific aspects are articulated in the philosophical, sociological, psychological and pedagogical planes and the neurodidactic principles are materialized.

The dynamic-operational component: includes the actions that are deployed from the levels for reading comprehension that contemplate the three modalities presented by Ocampo (2019), as part of the neurodidactic strategies: operational, methodological and socio-emotional (OMESO), for brain development and functioning taking into account a certain logical order, as well as the activities and typologies of texts.

Operational Modality (O): It is composed by a set of creative teaching styles, developed based on the student's interest and the context, where we can mention the prior organizers, the maieutics - the dialectic, mnemonics, analogy and metaphor.

Methodological Modality (ME): provides logical procedures in the search and construction of knowledge, which are based on operational and socio-emotional strategies; among them are mental maps, conceptual maps, scientigrams and neurographs.

Socio-emotional (SO) Modality: establishes the interaction among the physiological, psychological and behavioral aspects that involve the student in his/her educational experience. Among these strategies, relaxation, feedback and awareness can be distinguished.

The characteristics that distinguish the neurodidactic strategy are: it is dynamic-instrumental, socializing, experiential, integrative, guiding and formative, since in order to contribute to developing the reading comprehension skill, various activities and resources are used that favor interactions between the participating subjects in relation to their peers, teachers, their families and friends

and even texts as sociocultural instruments. It allows 8th year students of Basic General Education to be competent in all the activities that they must carry out, within or outside of their context, today as a student and then in their work and professional environment.

Table 3 describes the general structure of the neurodidactic strategy, with its stages, actions and content.

**Table 3-** Dynamics of the stages, didactic actions and contents for their implementation

Stages	Actions	Content
Initial characterization	- Evaluate students' level of reading comprehension.	- Identification of the needs and achievements of students in relation to the reading comprehension skill with emphasis on the literal, inferential and critical-evaluative levels, since different alternatives are conceived to address the variability of the students' characteristics and particularities
	- Observe performance in reading activities.	- Analysis of the students' modes of action in reading activities, in class and their application to the naming of the areas for improvement.
Didactic planning	neurodidactic approach, applying the operational, methodological and socio-emotional modalities (OMESO).	- Establishment of the relationship among objectives, contents, methodologies, organizational forms and systematized evaluation forms



		<p>in relation to the reading comprehension process as an experience in general terms, exciting, motivating and attractive from the corresponding modalities.</p> <ul style="list-style-type: none"> <li>- Development and promotion of critical and reflective reading through class to strengthen skills of analysis and evaluation of texts in a deep and meaningful way.</li> </ul>			<p>stimulation through various activities promotes greater understanding capacity in students.</p>
	<ul style="list-style-type: none"> <li>- Conceive tasks that generate collaborative work and cooperative values.</li> </ul>	<ul style="list-style-type: none"> <li>- Collaborative work in the teaching-learning process models a learning process of joint construction through interaction between students. To achieve this, effort, ingenuity and the application of skills are necessary, through steps previously defined by the teacher.</li> </ul>		<ul style="list-style-type: none"> <li>- Use specific evolutionary sequences.</li> </ul>	<ul style="list-style-type: none"> <li>- Use of strategies and activities designed to support students, in a progressive and systematic way. It is necessary to start with the least complex ones. Reading comprehension skills are worked on in two large blocks: Information tracking skills and information analysis skills. (Hoyos and Gallego, 2017).</li> </ul>
	<ul style="list-style-type: none"> <li>- Plan activities focused on stimulating cognitive, affective and socio-emotional processes.</li> </ul>	<ul style="list-style-type: none"> <li>- Activation of the processes for the development of reading comprehension skills: attention, perception, memory, thought, language, emotions, expression of feelings, are neurodidactic criteria that stand out in the teaching-learning process, their</li> </ul>		<ul style="list-style-type: none"> <li>- Relate basic units of information to integrate them into higher units with meaning.</li> </ul>	<ul style="list-style-type: none"> <li>- The identification of basic units of information will be facilitated to integrate them into higher units with meaning; processes that make it possible to assign meaning to the text in the context of comprehension (Hoyos and Gallego, 2017). Within this group are: rapid location of data, ideas and themes, recognition of the macrostructure and superstructure of texts.</li> </ul>
			<p>Evaluation and monitoring</p>	<ul style="list-style-type: none"> <li>- Use assessment instruments that support the</li> </ul>	<ul style="list-style-type: none"> <li>- Use of rubrics, checklists, analysis of the product of the</li> </ul>

	strategy feedback process, taking into account the development of reading comprehension skills at the literal, inferential and critical - evaluative levels.	activity according to the basic requirements for the development of reading comprehension: 1. Acquire and master word recognition and decoding skills. 2. Acquire skills for searching and constructing meanings, strategically under cognitive control.
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Source: Hoyos and Gallego (2017)

The actions are outlined as an essential core in the proposal made, where for the development of the stages and actions that correspond to it, it is important to determine the lines of action that guide the teacher's work in the design, development and evaluation of the activities. These didactic lines (Table 4) are fundamental to achieve effective and pertinent teaching, focused on didactic performance and the development of learning situations.

The need for the integration of OMESO modalities has been highlighted, which allows generating significant learning, based on the motivation to know the content of a text and the criteria that are handled in relation to the development of reading comprehension skills and cognitive stimulation, which influences the improvement of the functioning of the human brain.

**Table 4-** Guidelines for didactic action, mobility and dynamics of the neurodidactic strategy

Reading Comprehension Levels	OMESO Modalities	Neurodidactic activities and procedures	Textual typology	Resources
Literal	Operational	Neurodidactic sequences. Neurographers. Crosswords. Mind map. Conceptual scheme. Underlined. Tics (Edpuzzle).	Literary	Textbooks. Papers. Cards. Memoramas. Mnemonics. Language games. Slides. Edpuzzle App. Google earth. Google maps. Cellular. Data processor. Projector.
	Methodological	Tutoring motivation. Reflective-relaxation. Feedback. Life skills.	Argumentative	
Inferential	Socio-emotional	Interaction tactics. Advance organizers, silhouettes. Games.	News	
Critical Appraisal				

Source: Own elaboration

The development of the neurodidactic strategy allowed the creation of the conditions for its validation and that constitute the aspects that form part of the third phase of the study.

**Phase 3: To validate the results of the neurodidactic strategy**

The validation was carried out taking into account, in theory, the criteria of experts and, in practice, the systematization of experiences. The variant of consultation with experts (Expert Panel method) was used, in the topic of neurodidactics oriented towards the development of reading comprehension skills, combined with the survey. The selection of experts focused initially on the representativeness of the participants.

The following steps were followed:

- a. Definition of the selection criteria for experts (experience in the subject, professional career, academic training, relevance of their previous contributions, knowledge of the Ecuadorian context).
- b. Identification of candidates (review of articles, texts and presentations on the topic, search for references in academic databases, request for recommendations from professors and teachers in the area of neurodidactics and Language and Literature, evaluation of potential candidates, verification of degrees and certifications).
- c. Communication with identified candidates (self-assessment of their possibilities of participation, self-assessment of their ability to contribute to the panel of experts, availability to participate).
- d. Invitation to experts (establish a range of 10 experts depending on the context and available resources, send a formal invitation to participate in the panel with information on the objectives, responsibilities and estimated time for their participation).
- e. Monitoring and evaluating the performance of experts (regular communication flow with experts individually, initial meeting with experts via zoom, participation in small group work tables, panel with the participation of all experts online, presenting the proposal once suggestions and corrections have been made).

Survey for the validation of the final version of the neurodidactic strategy.

From a total of 16 possible experts, 10 were selected, two of which were rejected due to lack of time available to get involved in the activity and four who claimed lack of experience in the level where the study was carried out. Among their characteristics, they are currently teachers with doctorates in sciences related to neuroscience, studies in Learning Psychology,

Speech Therapy and in the area of Language and Literature in Basic Education, as well as having professional experience between 10 and 35 years.

The methodology used allowed for quality criteria regarding the strategy and its components, while its contributions and inputs were very useful for feedback and the creation of a more complete version.

Strategy review: Each expert received the strategy, evaluated the objective and the two components, by designing a form in the Google Forms tool, and validated it according to a rating scale from 1 to 5, where (1) does not meet the criterion, (2) meets a minimum level, (3) acceptable, (4) moderately high, (5) high. The parameters analyzed were:

- a. Clarity: the terms used in the theoretical-methodological component are precise and related to the stated objective.
- b. Relevance: The strategy corresponds to the students' educational sublevel, and reading comprehension is generated at the literal, inferential and critical-evaluative levels. Creative writing is encouraged.
- c. Feasibility: Printed and digital resources are easy to understand, manage and access for teachers and students.
- d. Relevance: It allows the stimulation of brain functions for reading comprehension. It includes exercises and procedures based on interhemispheric brain activation, neuroplasticity, stimulation of neurodevelopment and information processing at different levels.

Based on this assessment, there were suggestions that were integrated into the strategy, including: making the preventive factors and neurodevelopmental intervention more evident in their conception, taking into account the ontogenetic criterion and its importance for neurolearning, as well as adding activities in which a new criterion acquired through the strategy is used, such as debate,

simulators and musical supports, as well as manipulative ones. They referred to it as pertinent, feasible and relevant for the training and improvement of neurocognitive and neuroaffective functions.

The use of the variant of the Expert Panel method on the topic of developing the reading comprehension skill, allowed us to take advantage of the knowledge and experience of a group of highly academic professionals for the improvement and feedback of the neurodidactic strategy and its adjustment to the needs of the students.

Delving into educational practice through the systematization of experiences allowed us to visualize the main actors in the teaching-learning process during their participation in Language and Literature classes based on the development of the reading comprehension skill and the implementation of the neurodidactic strategy. The main results obtained with the systematization of experiences are described below, which aimed to: explore the conditions for modeling the neurodidactic strategy on the development of the reading comprehension skill in the 22 8th year students of General Basic Education at the "Alfonso María Borrero" school and the teacher of the Language and Literature subject.

The analysis is carried out taking into account three fundamental axes.

**Axis No. 1.** The teacher's role in the implementation of the neurodidactic strategy for the development of reading comprehension skills.

In relation to the teacher's role, this began to be strengthened to the empowerment of the neurodidactic strategy in personalized tutoring and support, with a total of eight interactions to work on the weaknesses identified in the diagnosis. The material used is based on the composition and dynamics of the strategy itself.

The introduction of the neurodidactic strategy with the students was carried out in the classroom context, in the subject of Language and Literature, which was subject to monitoring and control. It was carried out as part of the tutoring and accompaniment to the teacher in the classroom based on the direction of the teaching-learning process.

**Axis. No. 2.** Phases, actions and guidelines of the neurodidactic strategy for the development of reading comprehension skills.

Progress in the systematization of the experience is of great importance for the research process, which is described in the systematization of the experience carried out. It starts by using varied resources with attractions for the stage of development that allow capturing the attention of the students and motivate them to participate actively, where interactive and dynamic activities are conceived to promote student participation, such as: work with visual, auditory, manipulative, artistic support materials, games, use of computer labs, among others.

In the first class of introduction to new content, activities were developed to stimulate visual memory and perception through memoramas and interaction tactics. In the second, third and fourth classes dedicated to generalization, collaborative work was used to activate processes of reflection, feedback and life skills through questions in which students applied the levels of literal and inferential comprehension, which is related to the study developed by León, Santos and Alonso (2023), when they state that collaborative work creates a high degree of commitment on the part of the people who are part of the discussion teams.

In the fifth class aimed at practicing the content, the critical-evaluative level was worked on through the application of the evaluation that consisted of solving a questionnaire in the EDPUZZLE application. This tool combines a questionnaire with a video and has additional links to delve deeper into the subject.

During the development of the process, the teacher and the students recognized the effort and participation through phrases of praise, symbolic recognition and extra points in competitions among the collaborative groups.

**Axis. No. 3.** Role of students in the development of reading comprehension skills.

The role of students in the Language and Literature subject was enhanced through the awareness-raising activities developed. This could be seen in the teacher's exchange with the students about the activities that were developing criteria such as the following:

- There is a super, very positive atmosphere, we read, draw and even dance inspired by reading.
- We learned that you can read beautiful things in books and there are also sites on the web that offer quick readings that are for all tastes.
- I love seeing who has the best posture for reading, who takes the best care of the book, and surprising others by asking questions that they have to think about.
- My parents are helping me with the reading comprehension contest, they listen to me reading, correct me and give me some ideas.

These criteria are supported by the analysis of the results as part of the process of systematizing experiences and which constitute lessons learned in favor of the development of activities focused on offering a solution to the problem and field of action, where the need for students to master the three levels of reading comprehension becomes evident, which enables them to strengthen and to achieve metacognitive processes after reading a text.

Among the good practices identified for the fulfillment of the proposed objective, the planning of neurodidactic sequences for the development of reading comprehension skills at the three levels stands out; the application of neurodidactic activities to stimulate the brain's

executive functions, achieve motivation and activate cognitive and socio-emotional processes; the use of various sources of stimulation ranging from multiple sensorial to creative configurational, as well as the use of collaborative work for the joint construction of meaningful learning.

The evidence resulting from the application of the systematization of experiences allows for criteria on the viability of the neurodidactic strategy in educational practice, which complements validation by expert criteria.

## DISCUSSION

It is important to keep in mind that in order to achieve greater effectiveness in the development of Language and Literature classes and to reach levels of motivation in students towards reading, an adequate stimulation process is needed. Therefore, we agree with Aguilar (2023), when he expresses that: "when starting the subject with a stimulating activity, curiosity is immediately activated" (p. 156), in order to advance towards the generation of reading comprehension skills with criteria focused on the aspects to be favorably enhanced in the role of the teacher, the students and the didactic-curricular contextualization.

The didactic actions are closely linked to each other; they are considered necessary elements to take into account for the application of the strategy. The formation of a neurodidactic strategy, where two important components are dynamized, the first one that at a theoretical-methodological level articulates and integrates neuroscientific foundations and the second one whose dynamic-operational nature gives a peculiar meaning to neurodidactic resources, both printed and digital, stimulates the neuropsychological processes for learning to read and the development of the reading comprehension skill, being consistent with Cedeño and Bailon (2021) It will promote

creative activity and motivate the development of cognitive interests in students.

Among the good practices identified for the fulfillment of the proposed objective, the planning of neurodidactic sequences for the development of reading comprehension skills at the three levels stands out; the application of neurodidactic activities to stimulate executive brain functions, achieve motivation and activate cognitive and socio-emotional processes; the use of various sources of stimulation ranging from multiple sensory to creative configurational, as well as the use of collaborative work for the joint construction of meaningful learning, which, as González, Núñez, and Guaraca (2021) highlight, allows students to manage their knowledge and develop skills.

The study made possible to integrate relevant aspects related to the articulation of the neurodidactic approach, outlining a critical-reflective route for the assessment of the learning conditions that are necessary to promote critical and reflective reading aimed at understanding the world and its conception.

The theoretical validation and exploration in educational practice of the designed neurodidactic strategy includes the evaluation and development of complex cognitive skills that are required both in reference to the meaning of the words that make up a text, as well as the global understanding of the message it contains and that become important lessons that can be shared and socialized as part of the innovation in classrooms with new ways of teaching and learning.

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