



Research Article

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The HERVAT Method as a Neurolearning Strategy in Education

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Abstract

The pedagogical methodology has evolved in recent years, moving towards approaches that integrate advances in neuroscience with educational practices. In this context, the HERVAT method emerges, aiming to consolidate these advances and apply them in the educational sphere to enhance the learning experience. The main objective of this research was to implement the HERVAT method in various educational institutions in Ecuador. For this, a qualitative methodology was adopted, with an analysis based on the systematization of experiences and grounded in the profound interpretation of a specific phenomenon. Through a rigorous data collection and analysis process, which incorporated techniques such as observations and documentary analysis, the HERVAT method was applied to students in seven renowned educational institutions in the country. The findings of the study highlight those contemporary pedagogical interventions, supported by this method, emphasize the holistic development of the student. By integrating innovative techniques, such as gamification and multisensory stimulation, the aim is to align pedagogical practices with key discoveries in neuroscience. This alignment enhances brain plasticity, facilitating adaptability and depth in learning processes. The personalization of strategies and adherence to empirical evidence emerge as fundamental components to elevate educational quality in the contemporary era. It is concluded that the HERVAT method, rooted in neuroscientific principles, revitalizes learning by activating crucial neural circuits, optimizing aspects such as student attention and concentration. Strategies based on neurodidactics, backed by empirical evidence, highlight the relevance of natural environments and varied stimuli, enhancing sensory perception and the active commitment of the student in their educational process. This approach promotes comprehensive education, aiming to maximize each student's neurocognitive potential.

Keywords: Pedagogical methodology, neuroscience, HERVAT method, holistic learning, neurodidactics

1. Introduction

In the contemporary context, the educational landscape is undergoing an unparalleled transformation, which is greatly influenced by the drive to strengthen cognitive skills. These skills, vital for mental dynamics, play a crucial role in synthesizing experiences and knowledge, paving the way for the establishment of rich and meaningful learning (Cantor & Osher, 2021; Zurita Aguilera, 2020).

This educational transformation centers on two fundamental pillars: first, the need for relevant brain stimulation, and second, a deep understanding of the brain and its sophisticated mechanisms. Thus, the brain not only serves as a biological entity responsible for our actions but, beyond that, represents the epicenter of all cognitive processes, both deliberate and intuitive.

Due to this link between brain functionality and learning processes, neuroscience has risen to be a protagonist in the modern educational realm. This discipline sheds light on the structure and dynamics of the central nervous system, highlighting with particular interest the revolutionary concept of neuroplasticity and its repercussions in pedagogical contexts (Hawkins, 2021).

Emerging from an interdisciplinary theoretical framework, the concept of neurolearning intertwines with the central tenets of Psychology, Pedagogy, and Neuroscience, providing a holistic perspective on brain learning dynamics. Beyond observable patterns of knowledge acquisition, this approach encompasses metacognitive dimensions, delving into essential aspects such as self-regulation, motivation, and socio-emotional development (Kirchhoff & Keller, 2021; Maxwell, 2021).

When the theoretical foundations of neuroeducation are transferred to a practical context, encouraging discoveries have been recorded. Various studies corroborate that the implementation of these principles significantly contributes to the formation of neural connections, fundamental pillars for neuroplasticity. Similarly, it has been shown that such methodologies promote brain maturation, which enhances crucial skills such as language, attention, and memory (Giménez Beut & Ranz-Alagarda, 2019; Tau & Peterson, 2010).

Despite these notable advances and the synergistic convergence between different disciplinary fields, unexplored areas persist in the realm of neuroeducation. Specifically, a gap is identified in studies that delve into the adaptability and relevance of these approaches in varied cultural and geographical contexts.

At the crucible of this disciplinary intersection, the HERVAT program stands out, proposed by Ortiz in the Spanish landscape. Although preliminary research in Spain indicates positive results associated with this initiative, the extrapolation and adaptation of said program in contrasting environments, such as the Ecuadorian, still represent a research challenge.

Faced with these deficiencies in the research landscape, it is imperative to expand and diversify lines of study. This research is not only confined to the direct application of the HERVAT method but also aspires to be a valuable contribution to the theoretical body of neuroeducation. A detailed exploration of HERVAT's specific adaptations could generate vital guidelines for its deployment in regions sharing similar cultural and pedagogical features.

With the support of emerging data that underline the inherent advantages of this methodology, a renewed interest arises in examining its viability in different latitudes. Thus, the main objective of this study is to implement the HERVAT method in various educational institutions in Ecuador. Its mission is to discern its efficacy and adaptability as an innovative neurolearning tool in the realm of basic education. Additionally, this work is expected to provide significant perspectives for the adaptation and fine-tuning of the method, considering the cultural and pedagogical peculiarities of the Ecuadorian context.

2. Theoretical Foundation

2.1 Neuroscience

Neuroscience, in its disciplinary breadth, encompasses the comprehensive study of the nervous system, including its structure, function, development, genetics, biochemistry, physiology, and pathology. This discipline is crucial for unraveling the complex brain processes that underlie cognition and human behavior. According to Marini and Volk (2017) neuroscience constitutes a transdisciplinary field that amalgamates knowledge from biology, chemistry, medicine, and psychology, offering a holistic understanding of brain functioning and its implications in human learning and behavior.

2.2 Neuroeducation

Neuroeducation, emerging as an interdisciplinary discipline, applies neuroscientific discoveries to the educational realm. Gkintoni et al. (2023) conceptualizes neuroeducation as a meeting point between neuroscience, psychology, and education, with the primary objective of optimizing teaching and learning processes. This field focuses on understanding brain learning, proposing pedagogical strategies based on the knowledge of underlying neuronal mechanisms.

2.3 Neurolearning

Neurolearning represents the practical application of neuroscientific principles in learning contexts. Calvo (2019) points out that neurolearning involves understanding how experiences modify neuronal organization and, therefore, influence the ability to learn and retain information. This approach emphasizes the need to adapt teaching strategies to individual cognitive capacities, fostering more effective and personalized learning.

3. HERVAT Method Concepts

The HERVAT Method, represents an educational methodology that integrates neuroscientific elements into pedagogical practice (Cui & Zhang, 2021). This method emphasizes holistic learning, valuing the interrelationship between emotion, cognition, and social context in the educational process. Its personalized approach adapts to different learning styles and paces, promoting more inclusive and effective education.

3.1 Application of the HERVAT Method in the Classroom Context

The implementation of the HERVAT Method in the educational environment entails a transformation of traditional pedagogical practices. Baquerizo and Bodero (2023) indicate that this application is based on a student-centered approach, prioritizing interaction, critical thinking, and reflection. Adapting the educational environment to facilitate active and contextualized learning is fundamental, allowing students to construct their knowledge autonomously and relevantly.

This holistic approach of the HERVAT Method promotes comprehensive student development, encompassing emotional, cognitive, and social aspects, and respecting individual differences in learning. At the same time, the method faces significant challenges, including the need for specialized training for educators, curricular adaptations in rigid educational systems, new approaches to learning assessment, and requirements for resources and institutional support (Mtika & Gates, 2010; Parrilla, 2008).

4. Methods

In order to conduct a descriptive investigation of the phenomenon in question, a methodology based on a qualitative approach was chosen. This approach is recognized for its ability to establish a profound and meaningful interaction between the researcher and the object of study, allowing the unraveling of the complexities and nuances of the realities analyzed.

The core of this methodology is based on the systematization of experiences. Through this approach, the goal is to understand and reinterpret specific experiences, revealing both the underlying structure of processes and the actors and factors that influence their development. In this way, the primary aim of the methodology is to describe systematically and explain relationships and interconnections, providing findings susceptible to analysis that generate new theoretical insights capable of influencing the reality under study.

Regarding the operational design, it was divided into consecutive stages. Initially, a clear starting point was established, followed by the generation of guiding questions. Next, a review and analysis of previously documented experiences were undertaken, performing critical analyses and deep reflections. The final phase integrated and summarized the most notable findings and conclusions.

For data collection, mixed techniques were employed, which included direct observation, literature review, and document analysis. This combination was chosen for its potential to provide a comprehensive and multifaceted view of the phenomenon under study. The instruments used in this process consisted of a specific observation guide and cards for textual content analysis. Once collected, the data was organized and analyzed rigorously using a content analysis matrix, thus ensuring a systematic and cohesive presentation of the information.

It should be highlighted that the methodology of systematizing experiences was applied in seven prominent educational institutions in Ecuador. These establishments provided varied and valuable contexts, facilitating a more comprehensive and diversified understanding of the method's implementation and results in different educational and research scenarios.

5. Results and Discussion

Among the essential premises for systematization, the active participation in the activity and maintaining a detailed record of it stand out. From the teaching role of the Module on Special Educational Needs and their educational inclusion, taught in the Master's in Basic Education at the State University of Milagro (UNEMI), these premises have been met, using case studies as primary sources of information. This source has been circumscribed by key elements, such as the nature of the student group, which facilitates the classification and ordering of teaching materials. This allowed for the reconstruction of the pedagogical experience and provides the possibility of analysis and synthesis, as detailed below.

5.1 Methodological Approaches by Work Teams in the Educational Context

The research and pedagogical planning process within educational institutions has evolved significantly with the inclusion of collaborative approaches. In the following analysis, an approach is described in which, after a tutorial training, work teams are formed that interact with different educational institutions

Table 1. Methodological Approaches by Work Teams in the Educational Context.

Stage	Description
Tutorial Instruction and Team Formation	Before directly interacting with the institutions, it is crucial to adequately train team members to face educational challenges.

Stage	Description
Establishment of Relationships with Educational Institutions	Pedagogical success requires effective collaboration between researchers and institutions, including obtaining permissions and clearly defining objectives.
Identification and Analysis of Student Characteristics	To design strategies, it's essential to know the student population, analyzing demographic, academic, and socioeconomic data, and understanding their needs.
Planning Based on the Selected Pedagogical Method	With the information gathered, pedagogical interventions are developed, selecting methods aligned with student needs and institutional resources.

The complexity of implementing effective educational strategies is evident when observing each stage detailed in the table. It is crucial to emphasize that each phase represents not only a consecutive step but also a foundational pillar in the construction of impactful educational interventions. Contemporary literature in pedagogy underscores the importance of meticulous planning and a deep understanding of the target population to ensure the relevance of any intervention (James & Augustin, 2018).

A component of utmost importance, and often underestimated, is the symbiotic relationship between researchers and educators. Grossman et al. (2009) argue that while researchers can bring vast theoretical and methodological knowledge, it's the educators who have a practical and experiential understanding of the educational context in which any strategy will be implemented. Therefore, any intervention that doesn't leverage the potential synergy between these two groups runs the risk of being superficial or, worse yet, counterproductive.

Furthermore, Chambers and Norton (2016) contend that the dynamic and ever-evolving nature of educational institutions requires adaptability on the part of researchers. Mere planning based on static data is insufficient. Continuous collaboration with educators allows for real-time feedback and timely adjustments to ensure that interventions are not only relevant at the outset but remain pertinent over time.

In Table 2, presented below, crucial data related to an essential topic within the realm of education and child development are shown. Early recognition of difficulties and precise intervention at initial stages are critical factors that can significantly influence a child's life trajectory. These claims are not mere assumptions but are supported by numerous studies and empirical evidence accumulated over time in the pedagogical field.

The Canchagua Millennium Educational Unit, with a perspective grounded in science and the latest findings in the field of education, has taken a proactive stance towards this reality. In addition to recognizing the importance of early interventions, this institution has launched a comprehensive intervention program designed to address and remedy specific areas where challenges were identified in their students.

This initiative has not been an isolated or improvised effort. On the contrary, it was meticulously structured and overseen by a team of five specialists highly trained in different areas of child development. The program's design was based on a methodology centered on activities aimed at stimulating various sensory and motor areas. The primary goal of these activities is to provide infants with practical and effective tools and strategies that enable them to overcome and improve in domains where weaknesses or difficulties were detected.

To provide a clearer and more comprehensive view of the scope and content of this intervention program, the specific details of each implemented activity, as well as the underlying purposes of them, will be elaborated upon below.

Table 2. Activities Conducted by Group 1 at the Canchagua Millennium Educational Unit

Stimulation Area	Developed Activity	Purpose
Hydration	Taking a sip of water.	Develop attention, immediate memory, psychomotor responses, and improve conceptual speed.
Balance	Walking alternately on tiptoes in series of 10", 20", 30".	Strengthen coordination and balance.

Stimulation Area	Developed Activity	Purpose
Breathing	Deep breathing with an upright posture.	Improve lung capacity and promote relaxation.
Visual Stimulation	Tracking an object by passing it from hand to hand and looking towards each corner of the classroom.	Enhance focusing ability and visual tracking.
Auditory Stimulation	Identifying sounds of objects, imitating animal phonemes, and listening to varied music.	Improve auditory discrimination and encourage sound identification.
Tactile Stimulation	Recognizing shapes drawn on the back and removing dried rubber from hands.	Enhance tactile discrimination and improve fine motor skills.

The intervention process illustrated in Table 2 demonstrates a rigorous and versatile approach to fostering essential skills in children. Each meticulously designed activity harbors a well-defined purpose aimed at correcting and improving certain difficulties previously identified in these children. Initially, it is essential to address the intrinsic connection between proper hydration and cognitive function, a topic that has sparked interest in previous research. According to Masento et al. (2014), maintaining optimal hydration can be crucial for enhancing attention and short-term memory in children. In this context, the simple act of taking a sip of water, although it may be perceived as minor, aims to inculcate the habit of hydration and, simultaneously, activate cognitive capabilities.

On the other hand, activities that emphasize the development of coordination, such as walking alternatively on tiptoes, entail multidimensional benefits. Bolger et al. (2021) have highlighted that motor coordination is not only fundamental during childhood, but its effects can persist, influencing adaptability and the acquisition of new skills in later stages. Likewise, the role of breathing techniques must be considered. These, beyond strengthening lung capacity, have the potential to mitigate stress and anxiety in infants, as corroborated by Shonkoff et al. (2012).

Regarding sensory perception, skills such as focus, visual tracking, and auditory discernment stand as pillars in the educational process. The proposed activities, from meticulous observation of objects to the daring identification of sounds, are consecrated to reinforce sustained and selective attention, irrefutable aspects in contemporary pedagogy.

Lastly, but no less significant, tactile skills and fine motor skills play a crucial role in daily and academic activities. From writing to manipulating objects, exercises such as recognizing shapes through touch or handling specific materials like rubber are designed to sharpen tactile perception and manual dexterity.

Reflecting on these findings undoubtedly highlights the importance of designing holistic interventions tailored to the unique characteristics of each student. By adopting an individual-centered approach backed by scientific evidence, it becomes feasible to equip students with the tools and skills necessary to overcome challenges and thrive in an educational environment.

Table 3 breaks down the intervention strategies implemented at the Emilio Abad School; a renowned educational center located in the urban heart of Azogues. This institution, known for its rigorous commitment to the holistic formation of its students, identified specific areas of concern in a segment of its student population belonging to the fifth level of basic education. In response to these areas of need, the school mobilized a multidisciplinary team composed of five specialists, who embarked on the task of designing an intensive and specific intervention.

Table 3. Activities Conducted by Group 2 at Emilio Abad School

Stimulation Area	Week 1	Week 2	Week 3
Hydration	Three sips of water	One full glass of water	Drink from a bottle
Balance	Stand on one foot	Alternate foot and increase time	Walk on a marked line
Breathing	Inhale and exhale for 3 minutes with eyes closed	Repeat exercise from week 1	Repeat exercise from week 1
Visual Stimulation	Follow movement of an image for 2 min without moving the head	Follow movement for 3 min moving the head	Cover one eye and repeat the activity
Auditory Stimulation	Recognize sound repetitions with eyes closed	Extend time and change sounds	Extend time even more and vary sounds
Tactile Stimulation	Draw an image on a peer's back with a finger for 2 min	Extend the activity time	Repeat with extended time

Table 3 in the study on the educational intervention program at Emilio Abad School demonstrates a structured and progressive pedagogical strategy. This approach focuses on addressing multiple areas of student development, emphasizing the importance of adopting incremental methods in pedagogy. It is based on previous research on child development and learning and aligns with the principles of progressive and constructivist education.

In the area of hydration, the intervention began by encouraging the intake of small sips of water, gradually evolving to more significant volumes. This methodology aligns with recent research, such as that by (Goulart et al., 2023), which underscores the critical importance of hydration in optimizing cognitive function. Neuroscientific studies have shown that adequate hydration is essential for maintaining concentration, memory, and other essential cognitive functions in students.

Regarding activities to improve balance, a transition from static to dynamic exercises was observed, strengthening motor coordination. This progression is supported by studies such as those by Bekkering et al. (2000), Di Martino et al. (2013), and Thelen (2000), which have corroborated the central importance of motor coordination in child development. Motor coordination is not only fundamental for physical development but is also intrinsically linked to learning and cognitive skills.

Interventions designed for the areas of breathing, vision, hearing, and touch followed an equally evolutionary approach. Each of these activities was primarily aimed at improving lung capacity, sharpening sensory perception, and refining fine motor skills. For example, breathing activities not only improve cerebral oxygenation, essential for cognitive performance, but also contribute to emotional regulation and stress management, as suggested by studies in neuroscience and psychology.

Referring to Table 4, it's pertinent to highlight the initiative carried out by the "Hispano América" Educational Unit, strategically located in the Ambato canton, belonging to the Tungurahua province. This institution, in its commitment to the continuous improvement of learning and the well-being of its students, designed and implemented a pedagogical intervention program with specific objectives: to address and mitigate certain issues identified in a particular group of students. Although the data provided does not detail precisely the academic level of the beneficiaries or the exact number of participants, it does offer a meticulous breakdown of the planned activities and the responses obtained as a result of these interventions. For a clearer and more structured understanding, a table is displayed below that consolidates and categorizes the interventions carried out during this three-week program.

Table 4. Interventions Conducted by Group 3 at the "Hispano América" Educational Unit

Stimulation Area	Activity Description
Hydration	Game: "The captain commands to take a sip of water every 20 minutes".
Balance	Jump alternating between both feet.
Breathing	Inhale and exhale following instructions.
Visual Stimulation	Show the children various images of animals.
Auditory Stimulation	Listen to cell phone alarms and a bell.
Tactile Stimulation	Close eyes and allow a classmate to draw a number or letter on their hand, with the aim of guessing it.

The method used by Group 3 in the educational study reflects a gradual approach, in which the same activities are repeated over several weeks, progressively increasing their duration. This methodology has proven to be effective in pedagogy, as repetition and systematic progression can strengthen neural connections and improve skill acquisition, as indicated by Myer et al. (2015). This principle aligns with cognitive learning theory, which posits that repetition can facilitate memory consolidation and learning through neuroplasticity.

Initial challenges, such as confusion of numbers and letters or easy distraction, are common hurdles in students with certain attention deficits or sensory issues (Neuman, 1991; Sulaimani &

Bagadood, 2023). However, the improvement observed at the end of the intervention, with students showing increased alertness and receptiveness to instructions, indicates that the strategies employed had a positive impact.

The sensory and cognitive enrichment proposed by the activities, such as tactile and auditory stimulation, might have contributed to the enhancement of brain and perceptual functions (Cappagli et al., 2019; Chaudhury et al., 2013; Lane et al., 2019). These practices reinforce the notion that early and tailored intervention can be pivotal in addressing specific problems and enhancing students' performance and well-being.

Table 5, below, consolidates and synthesizes the pedagogical interventions carried out by Group 4 at the Benjamin Carrión Educational Unit. With a meticulous and structured focus, this group of specialists centered on a specific set of six-year-old children, previously identifying a set of challenges in the areas of hydration, balance, viso-motor skills, and sound recognition. Over three weeks, a series of playful and educational activities were deployed, designed with methods inspired by Montessori pedagogy, to address and mitigate these difficulties.

Table 5. Interventions by Group 4 at the Benjamin Carrión Educational Unit

Stimulation Area	Activity Description
Hydration	Game "Let's hydrate the brain", with taking three sips over one minute.
Balance	Walk on a straight line on the floor, carrying objects on the head; transfer objects between boxes following a line.
Breathing	Imaginative game of being a dragon, inhaling air and exhaling "breathing fire".
Visual Stimulation	Outdoor Montessori strategies: observing surroundings, playing with water and containers to learn about volumes.
Auditory Stimulation	Listen to sounds of nature and musical instruments like drums and maracas.
Tactile Stimulation	In pairs, one draws on the other's skin (with eyes closed) for them to guess the traced object.

The pedagogical approach adopted by Group 4 emphasizes the relevance of blending traditional educational techniques with playful strategies in order to optimize learning and adaptability processes in children. It's widely recognized that play plays a fundamental role in child development, not only because it is an intrinsically motivating activity for children but also because it offers opportunities to develop essential skills in thinking, problem-solving, and socializing (Habgood & Ainsworth, 2011; Yogman et al., 2018).

The "Let's hydrate the brain" initiative is a tangible example of how healthy behaviors, like hydration, can be promoted through fun and interactive methods. Proper hydration has been linked to improvements in cognitive function, memory, and attention in children (Adan, 2012; Merhej, 2019). It's a testament to how small changes in behavior can have significant repercussions on overall well-being and cognitive performance.

Furthermore, the balance strategy not only impacts motor skills but, as suggested, can enhance children's self-esteem and confidence, critical elements for emotional and social development (Najafabadi et al., 2018).

The incorporation of Montessori principles, on the other hand, aligns with an educational paradigm that acknowledges that children learn most effectively through direct and tangible interactions with their environment. Maria Montessori advocated the idea that experience-based learning leads to a deeper and more lasting understanding of concepts. According to research, such as that by Lamrani and Abdelwahed, (2020), the Montessori approach not only supports child cognition but also fosters a range of fundamental social and emotional skills in the educational process. Empirical practice suggests that direct experience with real-world materials and situations allows students to build their knowledge from a solid foundation, rather than merely memorizing information. This form of experiential learning promotes critical thinking, self-regulation, and a

proactive attitude towards problem-solving.

This teaching practice enhances concentration and promotes a deeper understanding of often abstract concepts.

However, not all interventions guarantee immediate or uniform success. Despite the playful nature of the activities, some children still faced challenges related to attention and coordination. This observation underscores the importance of constantly adapting pedagogical interventions, considering the individual and unique needs of each child (Coster, 1998; Laugesen et al., 2016).

On the other hand, the methodology applied in education has evolved, considering not only academic learning but also the holistic development of students. Group 5, in their intervention at the "17th of September" School, aimed to improve certain student competencies through activities that go beyond the traditional curriculum. These activities, focused on hydration, balance, breathing, visual, auditory, and tactile stimulation, aimed to strengthen concentration, participation, and cooperation among students. Below, we present a table that synthesizes these interventions and their respective characteristics.

Table 6. Intervention Activities by Group 5 at the "17th of September" School

Stimulation Area	Executed Activities
Hydration	Drinking water with variations in quantity and timing, use of timer, and peer support.
Balance	Standing on one leg, walking in pairs with alternating legs.
Breathing	Series of inhalation and exhalation exercises, unifocal nasal breathing techniques, and use of bags for breathing.
Visual Stimulation	Eye movements, tracking objects in pairs.
Auditory Stimulation	Identifying sounds with one ear covered.
Tactile Stimulation	Identifying objects of different textures with eyes blindfolded.

The intervention of Group 5 with fifth-year students at the "17th of September" School is a clear example of how the introduction of playful and dynamic activities can benefit learning. According to Hiser and Koenigs (2018), learning is a multifaceted process that benefits from stimulating various areas of the brain. The activities proposed by Group 5 aim precisely to improve cognitive function through the stimulation of different senses and abilities.

Initially, it is evident that the unconventional nature of the activities generated resistance and a lack of cooperation from the students. However, as Nordt et al. (2016) point out, repetition and familiarization with the activities can lead to greater engagement and content retention. The significant improvement in the students' attention, energy, and focus towards the end of the program corroborates this idea. This phenomenon can be attributed to the theory of habituation in learning psychology, where repeated exposure to stimuli results in a more efficient behavioral response.

Tactile and visual stimulation, in particular, has been linked to improvements in memory and concentration (Calancie et al., 2018). These stimuli can activate specific brain regions responsible for sensory processing and attention, thereby enhancing related cognitive abilities. For example, visual stimulation can enhance plasticity in the visual cortex, which is crucial for processing and retaining visual information.

Similarly, the practice of breathing techniques can have positive effects on reducing stress and increasing concentration (Migliaccio et al., 2023). Controlled breathing has been associated with the regulation of the autonomic nervous system's response, which can improve attention capacity and reduce anxiety levels, key factors in the learning environment.

Referring to Table 7, modern pedagogy highlights the importance of implementing innovative teaching strategies, which are not limited exclusively to the transfer of theoretical information. This perspective underscores the need to promote an education that fosters the holistic development of the student, enhancing not only the cognitive aspect but also their socio-emotional, critical, and

creative skills.

Aligned with this educational conception, Group 6 initiated a pedagogical intervention at the "Miguel Heredia Crespo" School. During this project, various meticulously designed activities were executed with the aim of strengthening and stimulating multiple skills and competences in the learners. This process not only sought to enrich their educational experience but also to adapt to the challenges and demands of the 21st century.

Below is a table that systematically details the activities carried out and the methodologies applied during the three weeks of intervention.

Table 7. Intervention Activities by Group 6 at "Miguel Heredia Crespo" School

Stimulation Area	Executed Activities
Hydration	Daily water intake to predispose the body for concentration.
Balance	Standing on one leg in series of 10, 20, and 30 seconds.
Breathing	Deep inhalations and forced exhalations ten consecutive times.
Visual Stimulation	Eye movements in different directions and tracking objects without moving the head.
Auditory Stimulation	Discrimination of tones, musical notes, and phonemes in both Spanish and English.
Tactile Stimulation	Touching different surfaces (walls, curtains, desks) to identify textures.

The activities carried out by Group 6 are a clear example of how incorporating exercises based on sensory and motor stimuli can strengthen skills such as concentration and coordination in students. According to Alabdulkareem and Jamjoom (2020), interventions aimed at improving physical coordination, balance, and breathing can have tangible benefits on executive functions, such as the ability to concentrate. These executive functions are crucial for learning and academic performance, as they regulate cognitive control, attention, and mental flexibility.

The challenging onset of the intervention, marked by resistance and adaptation difficulties, aligns with research suggesting that the introduction of new educational methods can initially produce anxiety and resistance in students (Keeney-Kennicutt et al., 2008). However, with repetition and familiarization, students tend to adapt to and benefit from these methods. This phenomenon is consistent with the theory of experiential learning, which emphasizes the importance of direct experience and reflection in learning.

The observed improvement in concentration and coordination at the end of the program reflects the efficacy of such interventions. As suggested by Albouy et al. visual and tactile stimulation, for instance, can positively impact sustained attention and working memory. Additionally, auditory discrimination exercises might hold the potential to enhance linguistic and auditory skills, as indicated by Tye-Murray et al. (2022) These findings are in line with educational neuroscience, which explores how sensorimotor activities can influence neural and cognitive development.

Furthermore, the focus on sensorimotor activities can have broader implications for neuropsychological development. Activities that require motor coordination and sensory processing can stimulate brain areas involved in the planning and execution of movements, as well as in sensory integration. This can have a significant impact not only on specific skills such as coordination and attention but also on overall cognitive development, enhancing capacities like information processing, decision-making, and problem-solving.

Moreover, it's evident that the educational process is not solely centered on acquiring theoretical knowledge but also on the comprehensive development of cognitive, motor, and socio-emotional skills. Group 7, composed of three participants, conducted a study at the Basic Education School Carolina de Febres Cordero, located in the Pampa de Rosas community, Sinincay parish, Cuenca canton, Azuay province. This intervention, targeting seventh-grade students from the basic intermediate sub-level, was grounded on various activities focused on gamification, balance, breathing, visual, auditory, and tactile stimulation. A table summarizing the executed activities and their primary objectives will follow.

Table 8. Activities Implemented by Group 7 at the Carolina de Febres Cordero School

Activity Type	Description	Main Objective
Gamification	Use of frozen water cubes with fruits and hidden stickers in water containers	Stimulate hydration
Balance	Movement meditation and walking in a straight line	Promote balance and concentration
Breathing	Abdominal breathing techniques and use of soap bubbles	Improve respiratory capacity and relaxation
Visual Stimulation	Blinking, focusing, and gaze exercises	Enhance visual perception and adaptability
Auditory Stimulation	Games based on sound recognition and reproduction	Fine-tune auditory perception
Tactile Stimulation	Use of different textures and surfaces	Enrich tactile perception

The program implemented by Group 7 was meticulously designed to address various areas of child development. According to Hernández and Moreno (2019), gamification is a technique that can increase motivation and commitment in learning, which was evidenced by incorporating playful elements to promote hydration. Gamification, by integrating aspects of play in educational contexts, can significantly improve student participation and interest in learning tasks, thereby facilitating the retention and understanding of educational material.

In the realm of balance, the combination of physical activities with meditation exercises reflects the Mindfulness in the classroom theories proposed by Brantley (2005), emphasizing the importance of connecting the body and mind to improve attention. The inclusion of mindfulness practices in educational settings has shown positive results in improving concentration, emotional regulation, and the overall well-being of students.

Regarding the practices of visual, auditory, and tactile stimulation, these directly address students' perceptual abilities. As Cappagli et al. (2017) note in their studies on perceptual development, the variety of stimuli presented can result in a significant increase in perception, adaptability to different contexts, and the improvement of psychomotricity. These activities are fundamental for the development of sensory and motor skills, which are crucial in the early stages of cognitive development.

Finally, the findings after the weeks of intervention, in terms of improvements in psychomotricity and attention, reinforce the perspective of Veldman et al. (2019) on the direct interaction between motor skills and cognition in child development. The relationship between motor and cognitive development is a growing area of research that suggests that the improvement of motor skills can have positive effects on cognitive development, especially in areas such as information processing, memory, and problem-solving.

On the other hand, in the modern scientific context, Table 9 reflects a meticulous neurocognitive analysis in children, which has been the subject of deep scrutiny and study over the past decades. This research particularly highlights the way in which external factors, such as the environment and pedagogical interventions, can have a significant impact on infants' cognitive development. Central to this analysis is the concept of brain plasticity, an intrinsic feature of the brain that facilitates its adaptation in response to a variety of stimuli. Next, we will delve into a detailed review of the neurocognitive advances derived from various case studies, placing particular emphasis on the interaction with pedagogical interventions.

Table 9. Observed Neurocognitive Advances

Observed Aspect	Results/Advances	Observations
Clear Instructions	Improvement in the activation of automatic processes	Facilitates brain adaptation and enhances learning

Observed Aspect	Results/Advances	Observations
Learning Diversity	Variability in response to stimuli	Pathologies or physical/psychological conditions can influence the process
Curiosity	Increase in confidence and assurance	Despite initial shyness, stimuli sparked interest
Hydration	Improved alertness and stress reduction	Water intake oxygenates the brain and relaxes the system
Motor Development	Bilateral activation of brain hemispheres	Enhances cognitive and motor skills
Visual Stimuli	Improvement in spatial localization and expansion of immediate memory	Benefits agility, reading, and thinking, especially evident in the third week

The remarkable plasticity of the brain, especially in its early stages of development, facilitates adaptation and evolution in response to stimuli and experiences, as postulated by Feldman (2015). This adaptive capacity is magnified when clear and precise instructions are presented, highlighting the importance of pedagogical methodology in the learning process (Schunk & Greene, 2017; Wood & Deprez, 2012). Neuroplasticity, which is the brain's ability to change and adapt as a result of experience, plays a crucial role in how children learn and assimilate new information. Therefore, clarity and structure in teaching can optimize the way the brain processes and retains information.

However, it is imperative to recognize and value diversity in the learning process. Each child, as an individual entity with a unique amalgam of experiences and conditions, interacts with the educational environment in different ways. Physical conditions, pathologies, or psychological circumstances can shape this interaction (Immordino-Yang et al., 2019), underscoring the essentiality of early and appropriate diagnosis to guide educational interventions. Recognizing this diversity is fundamental to designing inclusive and adaptive teaching strategies that respond to the individual needs of each student.

The data presented underscore how fundamental elements, such as hydration, can impact neurocognition. According to Karpecka and Fraczek (2020), adequate hydration can significantly improve attention and cognitive performance. This relationship underscores the importance of considering basic aspects of health and well-being in the design of educational programs. Adequate hydration is not only vital for physical health but also for the optimal functioning of the brain, especially in learning environments that demand sustained attention and intense cognitive processing.

6. Conclusions

In the contemporary framework of human understanding, Neuroscience has emerged as a paramount discipline that illuminates the underlying mechanisms of learning. Within this context, the HERVAT method, deeply inspired by neuroscientific precepts, emerges as an innovative resource for the educational community. Internalizing its importance allows educators to undergo pedagogical reinvention, constructing strategies that align with didactic, procedural, attitudinal, and methodological approaches, always with the vision of shaping an educational setting tailored to students' needs.

Adopting the HERVAT method catalyzes the activation of essential neural circuits. Through this activation, the individual's connection to the surrounding sensory world is established and strengthened. This enhanced perceptual potential, a result of the interaction between stimuli and neural networks, culminates in an increase in cognitive performance, with a notable improvement in the student's attention and concentration.

Rigorous empirical analyses, especially case studies, have amply validated the efficiency of the neurodidactic paradigm. Findings from these studies reveal that activities conceived within this framework not only energize and revitalize the brain but also, due to their playful and innovative nature, capture and maintain students' attention.

The profound link between attention and brain dynamics deserves special attention. This bidirectional connection underscores that attention, more than just a simple filter, is a transformative agent across multiple cognitive dimensions, from initial perception, through processing, to the long-term retention of information.

Likewise, the physical context in which these strategies are deployed is of paramount importance. There's a strong push for the implementation of activities in natural and open spaces. This immersion in environments rich in natural stimuli boosts the student's sensory intake, expanding their perceptual horizons.

Outdoor experience, in addition to providing an enriched context, creates a favorable emotional environment for learning. Simultaneously, such exposure to natural stimuli strengthens neural networks, optimizing the acquisition, processing, and consolidation of information.

On the other hand, active engagement in open spaces fosters unparalleled involvement and dedication from the student. The stimulating essence of these environments encourages curiosity and an exploratory disposition, inviting the student to constantly challenge and expand their cognitive and physical boundaries.

In essence, the HERVAT method, backed by contemporary neurocognitive science and supported by empirical findings, proposes an educational paradigm that transcends the conventional. Its aim is not merely to facilitate learning but also to promote a holistic development of the student, capitalizing on their innate neurocognitive potential.

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