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Original article

# Experiential learning in postgraduate training: a didactic strategy

# El aprendizaje experiencial en la formación de posgrado: una estrategia didáctica

# Aprendizagem experimental no ensino de pós-graduação: uma estratégia didática

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**ABSTRACT**

Experiential learning allows for the development of personality from the cognitive, affective and attitudinal aspects, based on the role of experience, which is important both in undergraduate and graduate levels, in university education. For this reason, the objective of this article was to socialize a didactic strategy based on experiential learning as a recursive method in postgraduate training for the preparation of collaborating teachers of the Sucre Mission, in the Sucre State of the Bolivarian Republic of Venezuela. Theoretical methods such as historical-logical, inductive-deductive, analysis-synthesis, modeling, systems approach, empirical (participant observation, documentary review and

consultation of specialists and mathematical statisticians) were used. The results of the diagnosis demonstrated inefficient development of experiential learning, poor use of the pedagogical experience of teachers and, therefore, poor connection of theory and practice, a product of the inadequate didactic instrumentation of experiential learning in postgraduate studies. The findings mentioned above allowed us to design a teaching strategy with a structure based on the Kolb cycle; its teaching structure has the following parts: cognitive imbalance, experiential interaction, Theorization, production, and metacognitive closure. The proposal was validated by specialist consultation, which demonstrated its relevance and feasibility, with all aspects evaluated as highly appropriate and appropriate. Experiential learning constituted a path to understanding and transforming reality from the combined perspective of individualization and socialization, through the interaction of theoretical and practical levels, supported by the subject's experiences.

**Keywords:** experiential learning; teaching strategy; training; postgraduate studies.

## RESUMEN

El aprendizaje experiencial permite desarrollar la personalidad desde lo cognitivo, afectivo y actitudinal, basado en el papel de la vivencia, lo cual es importante tanto en el pregrado como en el posgrado, en la educación universitaria. Por tal razón, el objetivo del presente artículo fue socializar una estrategia didáctica basada en el aprendizaje experiencial como método de recursividad en la formación de posgrado para la preparación de los docentes colaboradores de la Misión Sucre, en el Estado Sucre de la República Bolivariana de Venezuela. Se emplearon métodos teóricos como histórico-lógico, inductivo-deductivo, análisis-síntesis, modelación, enfoque de sistema, empíricos (observación participante, revisión documental y consulta de especialistas y estadísticos matemáticos). Los resultados del diagnóstico demostraron ineficiente desarrollo del aprendizaje experiencial, escaso aprovechamiento de la vivencia pedagógica de los docentes y, por tanto, pobre vinculación de la teoría y la práctica, producto de la inadecuada instrumentación didáctica en posgrado del aprendizaje experiencial. Los hallazgos mencionados permitieron diseñar una estrategia didáctica, con una estructura basada en el ciclo de Kolb; su estructura didáctica tiene las siguientes partes: desequilibrio cognitivo, interacción experiencial, teorización, producción y cierre metacognitivo. La propuesta fue validada por consulta de especialistas, que demostró su pertinencia y factibilidad de su propuesta, al ser evaluada en todos sus aspectos de muy adecuado y adecuado. El aprendizaje experiencial constituyó una vía de conocimiento y trasformación de la realidad desde

la perspectiva combinada de la individualización y socialización, mediante la interacción del nivel teórico y práctico, apoyados en las vivencias del sujeto.

**Palabras clave:** aprendizaje experiencial; estrategia didáctica; formación; posgrado.

**RESUMO**

A aprendizagem experiencial permite o desenvolvimento da personalidade a partir dos aspectos cognitivos, afetivos e atitudinais, com base no papel da experiência, o que é importante tanto no ensino universitário de graduação quanto no de pós-graduação. Por essa razão, o objetivo deste artigo foi socializar uma estratégia didática baseada na aprendizagem experiencial como um método de recursão na educação de pós-graduação para a preparação de professores colaboradores da Missão Sucre no Estado de Sucre, na República Bolivariana da Venezuela. Foram utilizados métodos teóricos como histórico-lógico, indutivo-dedutivo, análise-síntese, modelagem, abordagem sistêmica, empírico (observação participante, revisão documental e consulta a especialistas e estatísticos matemáticos). Os resultados do diagnóstico mostraram o desenvolvimento ineficiente da aprendizagem experimental, o pouco uso da experiência pedagógica dos professores e, portanto, a fraca ligação entre teoria e prática, como resultado da instrumentação didática inadequada da aprendizagem experimental em nível de pós-graduação. As descobertas mencionadas possibilitaram a elaboração de uma estratégia didática, com uma estrutura baseada no ciclo de Kolb; sua estrutura didática tem as seguintes partes: desequilíbrio cognitivo, interação experiencial, teorização, produção e fechamento metacognitivo. A proposta foi validada por consulta a especialistas, que demonstraram a relevância e a viabilidade da proposta, sendo avaliada em todos os aspectos como muito adequada e adequada. A aprendizagem experiencial constituiu uma forma de conhecimento e transformação da realidade a partir da perspectiva combinada de individualização e socialização, por meio da interação do nível teórico e prático, apoiada nas experiências do sujeito.

**Palavras-chave:** aprendizagem experiencial; estratégia didática; treinamento; pós-graduação.

## INTRODUCTION

In the 20th and 21st centuries, one of the most frequently asked questions has undoubtedly been what learning is, both at the educational and social levels. Consequently, a wealth of theory has emerged that classifies and characterizes countless types of learning. These types of learning, from different didactic approaches internationally and in Latin America, highlight the long-standing confrontation between traditional and new methods. A new impetus for this controversy came in 1950, when Piaget's operational psychology emerged, competing with the rise of behaviorism and the beginning of the influence of instructional technology. In the last thirty years, in the field of international didactic discussion, there has been a resurgence of these same debates, now renamed based on the distinction between "teacher-centered" and "student-centered" teaching (Gori et al., 2022).

Neuroscience emerges in the ongoing search for answers to these questions, a discipline that is gaining increasing interest in the teaching world, as it sheds light on how the brain learns, remembers, and forgets; processes that are important for teaching and learning. Just as functional systems allow for more confident application of tasks and approaches, it is important to understand what students are truly capable of. This approach provides the teacher with knowledge that allows him to create an atmosphere of joy and happiness in his class, with reduced tensions and a minimum of stress, threat and anxiety, which makes Einstein's statement a reality (cited by Menchén, 2019, p. 22): "The most important art of a teacher is knowing how to awaken in his students the joy of knowing and creating."

The future poses the challenge of a school that fosters the unity of neuroscience and pedagogy. It is worth highlighting that, "…studies in neuroscience do not intend, nor should they intend in any case, to replace pedagogical tasks and proposals. Neuroscience tells us how the brain works in each case and what correlation its functionality has with the various mental activities; and pedagogy develops educational strategies adapted to different situations to make the most of brain function, as it has done until now -but now possibly with more data, since it can use and benefit from those provided by neuroscience" (Bueno, 2018, p. 18).

Learning is not separate from emotions, therefore, working on the development of emotional intelligence, with the aim of students understanding and dealing with their emotions, is essential for lasting learning (Benavidez & Flores, 2019).

In this sense, the goal of neuropedagogy is for the community of education professionals to understand how the brain learns, how it processes information, how it controls emotions, feelings, and behavior, and how it is sensitive to certain stimuli. These innovative concepts, in the long term, make a difference in the quality of learning.

In the opinion of authors such as Araya-Pizarro y Espinoza (2020), the finding applied to the relationship between neuroscience and pedagogy makes it possible to know the optimization of the teaching-learning process, based on the functioning of the brain and the neurobiological foundations that support it.

Given the above, it is possible to understand that educating based on the possibilities of the brain magnifies the importance of teaching in the effective development of the teaching-learning process, and leads to the conception of an educational system that offers the possibility of adjusting to the diverse ways people learn, under an educational model focused on the well-being of its participants.

From a neuropedagogical perspective, learning is a mental process of transforming, storing, retrieving, and using information; therefore, it has greater meaning in the neural network, as it expands or modifies within meaningful, intertwined relationships; capable of establishing a relationship between what has been learned (previous experience) and the new content presented as an object of study. It is a cognitive dynamic that drives the transition from everyday, simplifying, experiential, and life-based ways of thinking to more complex and profound ones, which are enriched by scientific knowledge and foster processes of reflection, construction, analysis, and constructive criticism of educational problems that have a didactic approach.

From these neuropedagogical perspectives, it is possible to place ourselves, then, before a teaching-learning process where the didactic components are not conceived with a static structure, but rather it is a process that is permanently transformed as a result of successive restructurings that occur in the multiple and varied interactions that the subject establishes with others in diverse sociocultural contexts.

To achieve these goals, it is essential to examine the teaching methods that guide the teaching-learning process toward a specific objective, theme, or content; whether it involves presenting a topic of study in a logical and sequential manner, solving problems through research, teamwork, collaboration, or presenting results. The purpose of the teaching method is to achieve meaningful learning and the development of skills to obtain relevant, creative, and innovative solutions.

Therefore, teaching and learning strategies based on experiential learning guide students in their personal life projections and in their social reality; it confronts them with the construction of their own knowledge and, thus, transforms their own realities in relation to the development of competencies and leadership. Experiential learning is based on the premise of the transformation that knowledge makes, which is brought about by experience, according to Kolb (1984). It is linked to emotions, initiative, action, and to forming commitment, effort, dedication, perseverance, and responsibility in the student.

In keeping with the above, experiential learning, based on the knowledge and functionality of the brain and analogous to the teaching-learning processes, transcends the exercise of teaching definitions, skills, and values. It goes further, allowing us to describe and internalize new ideas that arise from reflection and our own experience.

Traditional teaching methods hinder a creative, reflective, and meaningful teaching-learning process. Furthermore, these methods fail to take into account students' interests, talents, and needs; their use also fails to consider their experience, prior knowledge, and individuality. The development of cognitive skills requires positive interventions involving emotions, attention, and motivation.

In the midst of a more current context, nuanced by the interdisciplinary nature of sciences such as neuroscience, neuropedagogy and neurodidactics, new ways of teaching are essential, methods that respond to these interests, where the teacher becomes a facilitator, learning rhythms are diverse and where the educator has to provide a series of didactic proposals for the improvement of this process, based on their expertise.

According to Gleasson and Rubio (2020), learning is a process in which knowledge is created through the transformation of experience. The individual takes and understands information from experience (concrete experience and abstract conceptualization) and transforms it (reflective observation and active experimentation); that is, they interpret and act on that information.

Using Kolb's (1984) words, experiential learning is a method that offers a framework within which the links among education, work, and personal development are strengthened. The author himself begins by understanding learning as the primary human process of adaptation, which occurs not only in the classroom context but in any setting, and is ongoing. His position demonstrates that learning encompasses several processes. He distinguishes that experience and learning are inseparable terms and that they imply one another.

Recursion is a fundamental concept in the exact and computational sciences that, by implementing repetition structures, can be used in any situation where the solution can be expressed as a sequence of steps or transformations governed by a set of rules.

It is a tool that allows us to think and reason differently, analyzing each problem from its simplest form and, from there, advancing, retreating, and overlapping until we achieve the final objective: a solution that is not the product of a jumble of ideas, but rather a choice of opportunities, which come from experience in solving or not solving a given problem. The student draws on their experience and knowledge to solve a learning situation; this continues through the process of reflection and thoughts derived from the experience that trigger learning.

The introduction of experiential learning, as a method of pedagogical recursion, contributes to the scientific recognition of everyday activities, enabling students to become aware of the recursive processes in which they are immersed.

Likewise, the use of experiential learning as a method of recursion allows for the development of strategies that provide feedback to the teaching-learning process, in addition to the development of competencies in the student's training profile or curriculum.

It enables learning that stems from lived experience, focused on reflecting and interpreting thoughts. It seeks a symbolic understanding of reality expressed through thematic analysis, followed by writing and reflecting on the lived experience. In this way, students use recursive thinking to learn; this is done through recursive signs, which consist of everything oriented toward mental processes, memory, logic, and concept formation. It enhances the recursive approach, in which learning is actively experienced and requires suspending a task and starting over. For these purposes, it is called recursive learning.

Due to the importance of the topic, a study was conducted at the Sucre Mission in the state of Sucre, Bolivarian Republic of Venezuela, to corroborate the use of experiential learning in postgraduate education during the 2022-2023 academic year. Annual reports from the mission's Research and Postgraduate Balance were reviewed, as well as the "University at Home" plan, a distance education modality aimed at developing the distance teaching-education process. It was also confirmed that the use of experiential learning is very limited in postgraduate teaching.

From a regulatory perspective, the provisions of the Organic Law on Education (LOE) are taken as a basis, in articles 37 and 38, respectively, of the Official Gazette, which states that in the National System of Permanent Training of University Teachers "It is an inalienable function of the State to formulate, regulate, monitor and control the management of teacher training policies through the competent body in matters of university education, in attention to the profile required by the levels and modalities of the Educational System" (Bolivarian Republic of Venezuela. National Assembly, 2009).

For its part, the actions of the Sucre Mission are reinforced by the improvement that occurs in the university sector, based on the innovative ideas of Trómpiz (2019), by implementing the General Plan for Rectification, Change and Renewal in the Ministry of Popular Power for University Education (MPPEU).

In line with the above, classroom observations and document reviews revealed that not all teachers view experiential learning as a resourceful method for developing training programs. The planned learning tasks do not foster the development of critical and reflective skills essential for professional development. Furthermore, they do not always leverage the content to connect it to community projects that facilitate the connection with professional practice. In other cases, the emphasis on experience is misplaced, diverting attention. This demonstrates the need for a solid theoretical foundation so that resourcefulness in experiential learning does not become a superficial approach that fails to adequately challenge preconceived ideas.

Although experiential learning is a valuable method in graduate training, it is essential that instructors be sufficiently prepared for its use in the teaching-learning process. Its recursive application poses a contradiction that must be carefully considered. It is essential to find a balance between the repetition of experiences and openness to new ideas, ensuring that students not only accumulate experience but also develop critical thinking and a deep understanding that transcends mere lived experience. The key lies in possessing scientific and methodological preparation that guarantees the integration of both approaches in a way that enhances learning without falling into rigidity and superficiality.

For this reason, this article aimed to share a teaching strategy based on experiential learning as a resourceful method in postgraduate training for the preparation of collaborating teachers of the Sucre Mission, in the Sucre State of the Bolivarian Republic of Venezuela.

## MATERIALS AND METHODS

The research methodology was mixed; that is, both qualitative and quantitative aspects were considered. Theoretical, empirical, and mathematical statistical methods were employed. The following theoretical methods were used:

Historical-logical: facilitated the theoretical and conceptual study of experiential learning and its influence on teaching-learning processes.

Inductive-deductive: It allowed for the development of a rigorous analysis of the topic, through a logical and orderly structure that contained general, particular, and unique concepts for the application of experiential learning in postgraduate training.

Analysis-synthesis: made it possible to identify, plan, organize, structure and synthesize the didactic planning of experiential learning in postgraduate training.

Modeling: allowed the execution of abstractions and generalizations about experiential learning in the educational context of postgraduate training.

Systems approach: This approach was applied to facilitate the orderly and chronological integration of the results obtained during the research. It was also used to determine interdependence, self-determination, autonomy, subordination, and direct connection to the developed teaching strategy.

The empirical methods used were the following:

Participant observation: allowed the researcher to obtain first-hand information on the inclusion of experiential learning in postgraduate training.

Document review: This review enabled the review of documents and bibliographies to verify the inclusion of experiential learning in the context of postgraduate studies, as well as previous proposals on the preparation of collaborating professors for distance education, using applications and communication platforms, and the methodological guidance received for the implementation of the "University at Home" program.

Specialist consultation: This allowed for the theoretical validation of the teaching strategy designed based on the criteria of the integration experience at the University and the characteristics of the

postgraduate training process, which provided valuable evaluation criteria for the preparation of collaborating teachers and other stakeholders involved in this training process.

The objective of the participant observation guide was to collect real-time information on the inclusion of experiential learning in postgraduate training in Venezuela through the Sucre Mission. The aspects observed included the use of active methodologies, the planning and guidance of tasks aimed at enhancing experiential learning, and the use of information technology and other communication platforms.

In the case of the document review, its objective was to gather information on the presence of guidelines for promoting experiential learning in postgraduate training in the aforementioned research context. The indicators reviewed were the inclusion of experiential learning in the Sucre Mission's governing documents, the explanation of the methodological approach, and the rationale provided in the documents for the most up-to-date didactic and pedagogical concepts regarding the research object.

The guide, which consulted with specialists and focused on the theoretical evaluation of the proposal, was developed based on the following aspects: scientific rigor, theoretical foundations, topicality and importance of the topic, clarity of the proposal, feasibility, relevance, viability, coherence, and assessment of the timeframe allocated for the proposal. The evaluation scale given to the specialists followed the Likert scale and was categorized as very adequate, adequate, slightly adequate, and not at all adequate.

Statistical-mathematical methods were also used to describe and explain inferences from the data obtained with the application of the diagnostic instruments.

The research process was conducted at the Sucre Mission in the State of Sucre, Bolivarian Republic of Venezuela. It was descriptive, field-based, and non-experimental. The sample consisted of 37 managers (university village coordinators, training program coordinators, and members of the governing body). Twenty-five collaborating faculty members were also included. The total population, which coincided with the sample, was 62 informants.

The research adhered to the ethical requirements of respect and honesty, as well as the confidentiality of each and every person who participated in the field research. They freely and voluntarily gave their informed consent for data collection and the assessment of the topic addressed.

## RESULTS

The results obtained after applying the instruments are explained below.

Participant observation results: The objective of the observation was to assess the teachers' interventions in guiding the teaching-learning process, in terms of planning and guiding tasks aimed at enhancing experiential learning, which would allow for situations that favored the construction of their own knowledge and thus transform their own realities in relation to the development of competencies and leadership. In addition, the collaborating teachers' position in incorporating the content of their subjects through their potential was analyzed, as well as that of their winners and communication applications and platforms. The collaborators' actions were evident when referring to their knowledge of information technology tools to prepare for teaching through Information and Communication Technologies, as well as their motivation in the face of problems that arose during the teaching-educational process. Four methodological workshops, five meetings of the collective of National Training Program (NTP) leaders, and 17 teaching activities (classes) were observed. In all these instances, all informants were present. The key criteria they presented were:

- The need for teacher and academic liaison training, which focused on developing competencies and leadership skills for using experiential learning methods in the teaching-learning process, given the situation of frequent changes in management structures that did not maintain stability in policies and the way they were addressed, was recognized by 91% of respondents.
- The existence of new trends associated with the educational process for university teaching has needed the use of new methods that foster the construction of learning through experience, according to 88% of those surveyed.
- The introduction of the experiential learning method in the preparation of the contents of the PNF curricular units in which the teacher worked was supported by 96% of those surveyed.
- The attention paid to the organizational and functional specificities of the teaching process under the municipalization of university education, with an emphasis on information and communication, was recognized by 98% of respondents.
- Teachers were motivated to use this method given the needs that arose in a new educational context, according to 98% of respondents.

Results of the bibliographic review: The documents reviewed, as noted above, were: the "University at Home" Plan, the methodological guidelines of the National Training Programs (PNF), and the curriculum.

This literature review found that, regarding the inclusion of experiential learning in the governing documents of the Sucre Mission, there were no precedents or research papers that could serve as a model for developing the "University at Home" approach, based on the pandemic situation, using this experiential learning method.

Regarding the rationale provided in the documents on the most up-to-date didactic-pedagogical concepts related to experiential learning, no theoretical-methodological guidelines were found for this level of teaching and type of training. A lack of guidelines related to the knowledge and functionality of the brain, the analogy of teaching-learning processes based on reflection and personal experience, consideration of students' interests, talents, and needs, as well as the use of student experience, support for their prior knowledge and individuality, and the positive use of emotions, attention, and motivation were noted.

Likewise, regarding the guidelines for methodological treatment, the use of traditional methods was noted, which did not consider experiential learning as a recursive method. Furthermore, it was determined that some guidelines were given for the use of communication applications and platforms to develop the "University at Home" approach, but these were general and imprecise, far removed from the appreciation of experience and its circular cycle (feedback) for training.

These results allowed for the design of a teaching strategy based on experiential learning as a resourceful method for postgraduate training, within the context of the Sucre Mission in Venezuela.

Background: By studying the theories of neuroscience, neuropedagogy, didactics, and, within these, experiential learning, it became evident that the implementation of this theoretical approach in educational practice required a particular didactic arrangement. Consequently, and as a central core, the Kolb cycle, already explained above, constructed a didactic structure for the class based on experiential learning, within postgraduate training, using educational technology and distance education as its means.

Initial premises for the didactic structuring of experiential learning as a method of recursion:

1. Dialectical interrelation between neuropedagogy and didactics.
2. Respect for the logic of introduction, development and conclusions in the class uses the didactic categories established by didactics as a science.
3. Assumption of experiential learning as a guiding method based on pedagogical recursion.
4. Training in generic and specific skills.
5. Relationship between the didactic structure of the class and the Kolb cycle (concrete experience, reflective observation, abstract conceptualization and active experimentation).

Neuropedagogy stands as the backbone science that allows us to realize the contributions of the former in education and, of course, in didactics, harmonizing teaching and learning processes through the classroom as their fundamental cell. In this interrelation of neuropedagogy with didactics, methods, content, media, achievement indicators, teaching methods, competencies, evaluation, teacher, group, and students are put to work, based on experiential learning, from the introduction to the conclusions. This fosters the development of new neural connections and the secretion of chemical components that enable learning in a more efficient and motivating way.

Experiential learning is assumed to be the guiding method, as the new didactic structure offers actions and operations that direct the teaching and learning processes, energizes personal and collective experience as springs of cognition, fosters reflection, critical analysis, emotional regulation, decision-making, and accountability for results. At the same time as experiential learning is established as the guiding method, a multitude of teaching methods of proven educational and instructive merit are also used, such as verbal, visual, practical, problem-based, explanatory-illustrative, reproductive, expository, collaborative development, independent work, and investigative methods.

The use of experiential learning as a method of resourcefulness allows for the development of specific competencies; that is, those inherent to specific sciences, defined according to the achievement indicators established in the various forms of teaching.

Due to the guiding methodological nature of experiential learning in the proposed didactic structure, the authors determine four specific competencies to be developed in students, in correspondence with the four stages defined by Kolb and which are stated below:

1. Competence for involvement in one's own and others' specific experiences.
2. Competence in observation and reflection from diverse and relativized positions.

3. Competition of unity of theory and practice.
4. Competence of application in dissimilar contexts, extrapolating knowledge and emotions from the transformative experience.

Similarly, generic competencies are developed, which contribute to overall personal development and are manifested in the educational context, as well as in micro- and macrosocial development, since experiential learning allows for *the strategic and active application of theoretical knowledge to practical projects in a multitude of settings inside and outside the classroom.* This group includes competencies such as:

1. Ability to organize and plan as a team.
2. Oral and written communication.
3. Knowledge of a foreign language.
4. Computer knowledge related to the field of study.
5. Individual and group problem solving.
6. Decision making.
7. Critical reasoning.
8. Ethical, responsible commitment.
9. Creativity.
10. Leadership.
11. Ability to apply theoretical knowledge in practice.
12. Negotiation skills.

As suggested, the use of the experiential learning method in its didactic arrangement assumes Kolb's cycle. The four stages (concrete experience, reflective observation, abstract conceptualization, and active experimentation) are presented in an apparent order, but at the cerebral level; the stages operate with a systemic, replicated sequence, as an inherent recursion in the learning process, providing a triadic balance among the affective (emotional), behavioral, and cognitive aspects.

The didactic structure that is built taking experiential learning as a recursive method is composed of:

1. Opening: This is the initial motivation, allowing for an introduction to the topic in a welcoming manner, like a conversation. It is a simple, pleasant, participatory, and anticipatory primary approach, as cultural references are presented, clarified, or expanded upon, bringing the topic

closer and creating emotional "buzz," springs of stimulation, to move from the simple to the complex in learning. It belongs to the class introduction.

2. Cognitive imbalance: This is the disruption of comfort; situations arise that cause certain instability in cognitive, emotional, and behavioral aspects, based on achievement indicators. This is part of the class introduction.
3. Experiential interaction: The student interacts with others´ concrete experiences, quickly surveys key ideas, draws preliminary inferences, and foreshadows possible analogies between their own lived experience and that of others. This is part of the lesson plan.
4. Theorizing: A conceptual approach is taken to the basic constructs of the topic without exhausting the subject and leaving room for critical reflection. The student theorizes, classifies, or generalizes his experience in an effort to generate new information. This is part of the class development.
5. Production: The student moves to a level of application, based on the experience of others, their own experience, and the theoretical approach to the topic. They apply the recently acquired knowledge to their own life, which constitutes a new experience from which the cycle begins anew. This is part of the class development.
6. Metacognitive Closure: Conclusively, this approach fosters awareness and control of students' intellectual activity and learning processes, fostering regulation and self-regulation, according to their level of development. It is based on questions such as: what should I do? what interests me? what doesn't interest me? what am I missing? how do I find what I'm missing? why should I do this or that? what value do I deserve? and others. This is part of the class's conclusions.

The explained teaching structure was implemented in postgraduate training through teacher training courses using distance learning and the Moodle platform. The teaching structure explained in a training course is demonstrated below.

**Teacher training course**

Topic: Neuropedagogy and its impact on learning.

1. Opening

The concern of the true teacher, since ancient times, for educating the minds and hearts of his students is notable.

The novelty lies in the scientific demonstration of these arguments. It draws on the contributions of neuroscience, which has described brain functions in human learning, the role of emotions, and their implication in intellectual development; all of which, applied to the field of pedagogy, has given rise to a very young scientific discipline: neuropedagogy.

Because of the contributions of this science to your work as a teacher and to your professional development, this course, " Neuropedagogy and its Impact on Learning," has as its essential contents: the object of study of neuropedagogy as a scientific discipline, the relationship between neuropedagogy and school learning, and the application of the contributions of neuropedagogy in the educational context.

2. Cognitive imbalance

In the teaching profession, there are many unexpected situations, real surprises.

For example:

a) Her boyfriend interrupts his girlfriend's class to give her a bouquet of flowers. What should we do as teachers?
b) A girl is being evaluated on a final exam, but first brings her teacher a flower arrangement to place in the classroom. How and on what basis should this girl be evaluated?

These are questions that invite reflection and compel us to consider emotionally mediated learning. Let's look at the unforgettable classroom experiences of a group of Peruvian teachers, always remembering Socrates's adage, " Knowledge begins in wonder."

Achievement indicators:

a) Explain the object of study of neuropedagogy as a scientific discipline.
b) Analyze the relationship between neuropedagogy and learning.
c) Apply the contributions of neuropedagogy in the educational context, through strategies of good teaching practices.

3. Experiential interaction

Students are asked to share some teaching anecdotes and discuss them in groups. An assessment is then conducted.

Quiz (assessment)

Mark the idea that most fully summarizes the thesis defended in this video:

__Education without instruction is an unfinished, incomplete, and futile process.

__True education combines the cognitive and emotional aspects for greater learning.

__School discipline must not be violated in any way to avoid the deformation of the human being.

4. Theorization

- Object of study of neuropedagogy as a scientific discipline.
- Relationship between neuropedagogy and school learning.
- Application of the contributions of neuropedagogy in the educational context.

Quiz (assessment)

**Section 1**

Select the true statements.

1. Neuropedagogy is a science that studies how the brain functions during learning, enabling it to improve teaching-learning processes and identify neurological causes that impede learning.
2. Neuropedagogy integrates sciences such as didactics, psychology, and philosophy to study the behavior of the human brain in the school setting.
3. Neuropedagogy as a scientific discipline of the 20th century allows the study of learning at a social level, linking the family and the community in an integrative nucleus.

**Section 2**

Mark the correct answers.

__The study of brain connections has fostered the emergence of more dynamic, lasting, and experiential teaching and learning methodologies.

__The study of emotions at the brain level is a breakthrough in neuroscience applied to pedagogy in the 20th century, of great scientific value.

__School learning should be focused on emotions and reasoning, on constant motivation.

__Scientific discoveries in the field of neuroscience, such as brain plasticity and mirror neurons, have enhanced learning.

__Scientists in their neurological studies have proven that the brain remains static during learning in any area of knowledge.

**Section 3**

Highlight good practices of neuropedagogy in the educational context.

__Challenges supported by emotion and learning.

__Standardized and closed assessments.

__Open questionnaires.

__Teamwork, collaborative.

__Linking the visual, the kinesthetic and the auditory.

__Boosting brain connections and regulating emotions through teaching.

After watching the video, mark the aspects that the specialist identifies as key to a good class.

__Strengthen the what and the why, above the how with motivation and emotion.

__Demonstrate knowledge with science and evidence in a meaningful way.

__Educate to change for oneself and for others.

__Make the classroom a sacred altar of knowledge.

__Enhance students' receptive attitude.

5. Production

Observe:

a) the teacher's face
b) the activity being carried out
c) the protagonists of the same
d) the educational environment

Reflect: how does neuropedagogy manifested in the classroom shown to you?

Build a teaching activity that highlights neuropedagogy as an essential pillar for your teaching success.

6. Metacognitive closure

Now let's reflect on your work as a teacher, based on what we've learned in this course.

But first, let's go back to the educational situations you encountered at the beginning. Do you remember those "surprising" initial situations?

We'll repeat them to you:

Her boyfriend interrupts his girlfriend's class to give her a bouquet of flowers. What should we do as teachers?

A girl is being evaluated on a final exam, but first brings her teacher a flower arrangement to place in the classroom. How and on what basis should this girl be evaluated?

What would you do with this boyfriend, this girl, this emotional group? What would your reaction be? We hope you'll be inclined to take advantage of the opportunity to reinforce feelings of love, to highlight the beauty of the gesture, and not to go down the path of breaking strict discipline or disrespecting the academic schedule. In short, though you'll also point out afterward that the rules and regulations are being followed. Is that okay with you?

And with the flower arrangement girl, would you only evaluate her academic knowledge? What about her attitude? What about her concern for making the evaluation more enjoyable? What would you do about that?

So let's continue reflecting on your educational practice:

What and how do you apply neuropedagogy in your professional teaching practice?

What could be more difficult to implement? What barriers do you encounter?

How can you transform them?

In a course dedicated to neuropedagogy and its contributions to students' personal growth, and to the prospect of new classes that enhance cognitive and emotional development, it is essential to value the dictum of the brilliant mathematician and physicist Albert Einstein: "The significant problems we face cannot be solved at the same level of thinking we had when we created them."

The teaching strategy was validated through expert consultation. In this case, 23 managers were surveyed, all of them teachers with postgraduate training in Venezuela and with published research papers related to the research topic. The following aspects were evaluated:

- Scientific rigor: theoretical foundations on which the scientific result is based.
- Current status of the research topic.
- Importance of the topic selected for research.
- Clarity of the proposal. The guidelines, description, and recommendations are clear for implementation.
- Feasibility of its application in the given research context.
- Relevance of the scientific result.
- Feasibility. The proposal is appropriate to the specific conditions of the research context.

- Coherence. The order in which the scientific results are presented is appropriate and facilitates their application.

The consultation with specialists showed, according to the scale used, that 21 specialists classified it as very adequate and two as adequate, which makes it possible to affirm that the scientific result and its implementation in educational practice are relevant.

## DISCUSSION

Experiential learning values the differences of each individual. Drawing on students' prior knowledge and the acquisition of new constructs, which are fluidly generated as links that unite into an unknown framework that results in meaningful learning, the search for and growth in discernment is driven by innovative teaching and learning (Espinar & Vigueras, 2024). At the same time, Landini's (2023) research made it clear that "learning by doing and experiencing" does not refer to a single event or process, but rather to a variety of different processes. In other words, developing experiential learning is multifactorial and causal, which implies that teachers must consider the students' psychopedagogical and social characteristics in any type of intervention, in favor of experiential learning.

The above analyses present a new approach to teaching where students experience learning in a way that fosters their well-being, where there is pleasure in the accomplishment of the activity, optimism, and dedication to building a product and reaching a goal. This leads to success and becomes a remarkable experience in the brain, generating happiness, security, and self-confidence in students, thus raising their self-esteem. This regulates their learned behavior, influenced by this open learning environment that projects either avoidance or acceptance of knowledge.

The student's experience is accompanied by mental representations that he or she uses to internalize knowledge. This knowledge, when assimilated through inter- and intrapsychological training, allows for the memorization of what will become the path toward recursive thinking. Recursiveness is, without a doubt, a path to cognitive development, based on experience and meaning.

Teaching strategies based on experiential learning and resourcefulness must be constructed in strict adherence to the subject's experience. These experiences must be rigorously planned, executed, and evaluated, following Kolb's theoretical model, to achieve maximum student learning while simultaneously meeting all ethical intervention criteria, without jeopardizing the well-being of

students or others participating in the process. Evaluation is especially relevant for identifying opportunities for improvement and perfecting future experiences (Villarroel, Gutiérrez, 2021).

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**Conflict of interest**

Authors declare no conflict of interests.

**Authors' contribution**

The authors participated in the design and writing of the article, in the search and analysis of the information contained in the consulted bibliography.