

Current relevance of Significant Learning in medical education

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Abstract: This article addresses the relevance of significant learning in education, highlighting the theoretical perspective of Ausubel (1978) that emerged in the seventies. Despite not being a recent trend, the implementation of this approach is not common, and university teachers continue to use mechanical and repetitive methods that relegate the student to a passive role. All of this despite the fact that in the field of health sciences the need to change paradigms in teaching and learning is emphasized, and recognize that new learning is generated in significant contexts and is connected to the students' previous knowledge. Motivated by this premise, the team of authors carried out an investigation to investigate the concept and applicability that a group of master's students in Medical Education give to significant learning. The methodology used included a survey with open questions to understand the scope and applicability of this concept in teaching clinical practice, through a qualitative research approach, using a survey of open questions about the poor implementation of significant learning, the background on the prevalence of transmissionist methods as well as the perception and application of this approach. The results highlight the resistance to the implementation of significant learning, evidencing the prevalence of traditional methods. Quantitative figures are presented to support these observations, underscoring the need for a change in teaching practices. This study proposes solutions to promote significant learning in medical education and highlights the implications and applications of the results in teaching clinical practice.

Keywords: significant learning, mechanical learning, teaching, teaching practice.

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1. Introduction

In the vast field of learning theories, the proposal of significant learning, presented by David Ausubel, stands out as a perspective that seeks to explain the nature of the learning process in an understandable and systematic way in the educational field. Ausubel conceives of the educator as a committed facilitator, who constantly guides and questions in a conducive environment, based on learning principles that are based on the recognition of students' prior knowledge and its connection with new learning through cognitive interaction. critical and dialogic. It is essential to consider the coexistence of mechanical knowledge, understood as theoretical and rote, often misinterpreted and underestimated. This type of learning maintains a direct and bidirectional relationship with significant learning. Numerous forms of significant learning originate from the mechanical, and in turn, the latter can enrich the growth of significant learning. The comprehensiveness of learning is configured in an intermediate zone, where representational and conceptual learning converge (1-5).

In this context, the problem of the poor implementation of significant learning in the training of students in Medical Education arises, revealing a gap between the theory proposed by Ausubel and current educational practices. This discrepancy not only poses a challenge to the effectiveness of the training process, but also directly impacts the quality of future health professionals.

The relevance of addressing this problem lies in the need to improve the training of health professionals, highlighting the importance of effectively applying significant learning. Despite theoretical proposals, such as that of Ausubel, that advocate pedagogical approaches based on this type of learning, a lack of consistency is observed in its application in medical training, as previous antecedents suggest (6-7).

This research, carried out in the context of the training of master's students in Medical Education at the University of La Sabana (Chía, Cundinamarca, Colombia), between July 2021 and July 2023, seeks to overcome the identified resistance to the implementation of learning significant. Through specific research questions, students' conceptions of significant learning and its application in clinical teaching practice will be explored, with the aim of proposing concrete solutions and filling the gap between theory and educational practice in the field of medical training.

2. Methods

The research adopted a qualitative and quantitative approach and was structured as an exploratory case study, aimed at understanding the conceptions of master's students in Medical Education about significant learning and its application in teaching clinical practice. The population selected for the study included 15 students and graduates of said master's degree, who participated voluntarily by answering a questionnaire with open questions designed virtually. The selection process of the questions used in the information collection instrument was carried out through a rigorous validation process by national and international experts, based on criteria of experience in Medical

Education. Informed consent was obtained from participants before inclusion in the study, and the analysis period spanned from July 2021 to July 2023.

The main data collection technique consisted of a questionnaire with open questions, administered virtually through a Google form. This questionnaire was designed by the group of researchers and subjected to a double validation process by national and international academic reviewers. The processing and analysis of the information included an exhaustive review of the responses, classification of trends, categorization, tabulation, search for similar responses and triangulation of the information. Qualitative and quantitative analyzes were conducted to understand Medical Education students' conceptions of significant learning. In the quantitative analysis, percentages were calculated using the Microsoft Office package, specifically Word and Excel, and the Google Drive form tool was used to process the information collected, thus offering a more precise vision of the trends and opinions identified in the study.

3. Results

When we asked about the definition of significant learning (question: "How would you define significant learning?"), student responses highlighted the importance of several key aspects related to significant learning (Figure 1). 45% of participants emphasized the association and connection between the student's prior knowledge and new information as a fundamental element for deep and lasting understanding. In addition, 20% mentioned that significant learning is related to the ability to apply knowledge in practical and real situations when necessary. 15% of the responses highlighted the need for a deep, analytical and critical approach in the learning process, which implies a more complete understanding of the concepts. 10% mentioned the restructuring of prior knowledge to integrate new information and the active construction of knowledge by the student as essential aspects.

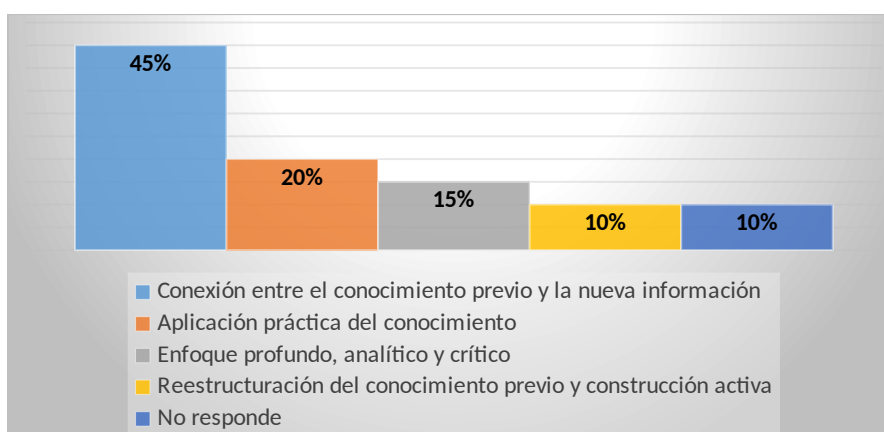


Figure 1. Opinions about significance of significant learning.

The previous responses are in sync with what was stated by Oré and Rocha, who point out the need for the practical application of knowledge in real situations and the importance of a deep and analytical approach in the learning process (1-2). The restructuring of prior knowledge to integrate new information and the active construction of knowledge by the student were also highlighted in both student responses and articles. Although to a lesser extent, both the responses and the articles mentioned the long-term retention of the acquired knowledge, its impact on daily practice and the increase in interest, as well as the student's understanding, as results of significant learning (3). These elements are also raised by López and underline the relevance and effectiveness of this

educational approach in the medical context, providing a solid basis to continually improve the teaching-learning process (4).

Comprehension.

When delving into the understanding of the concept (question "How would you describe your understanding of significant learning during the course of the master's degree in Medical Education?"), the responses emphasized several crucial aspects related to significant learning (figure 2). 30% mentioned the concrete application of the concept of significant learning in their teaching practice, indicating that learning translated into tangible actions in their work. Additionally, 25% highlighted the transformation of their thinking and approach to teaching as a result of understanding significant learning, reflecting a fundamental conceptual change. 20% highlighted that the master's degree allowed them to broaden their vision of learning and the structure of knowledge, which suggests a deeper and more holistic understanding of the learning process. Furthermore, 15% mentioned that the course complemented and cemented their previous knowledge, evidencing a process of consolidation of the knowledge acquired.

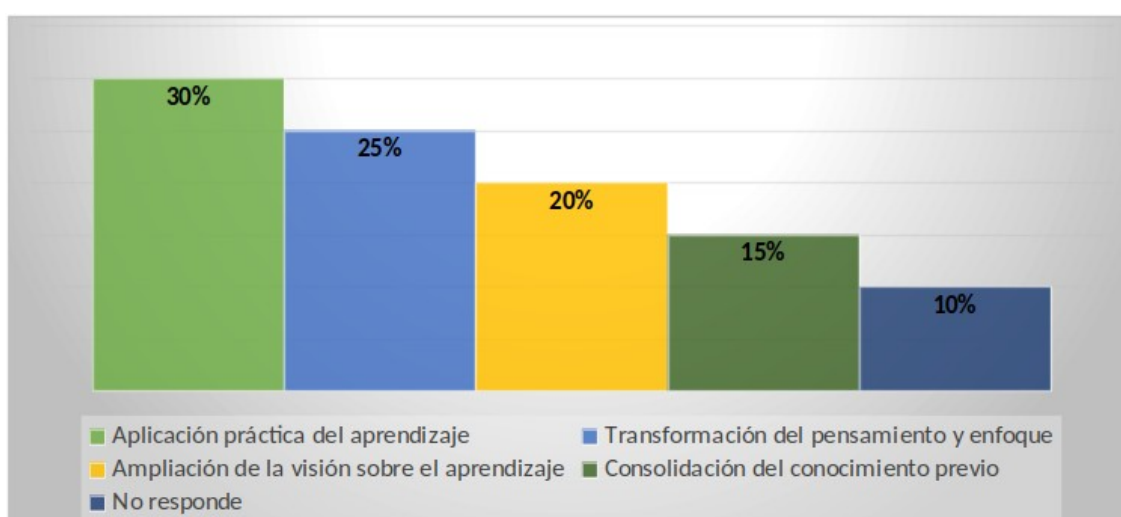


Figure 2. Comprehension of significant learning.

Viniegra-Velázquez support these findings by focusing on the active and committed participation of students in the learning process. The studies of these authors highlighted that motivation and functional understanding of information are fundamental for active participation, which is characterized by a systematic, analytical and reflective study of the content (5). This perspective aligns with the students' responses, which mention the practical application of significant learning in teaching practice and how this approach transforms both thinking and approach in teaching. Furthermore, both sources indicated that active participation can be achieved through interaction with others, whether classmates or teachers, and that this type of participation has a positive impact on the training of students and on the subject's identity as a learner (6-7).

These results underline the relevance of active participation and deep understanding of significant learning in both teaching practice and student identity, providing a solid foundation to continuously improve the teaching-learning process in the medical field and establishing a comprehensive framework. for future educational research.

Impact.

When asked about the impact that significant learning has had on clinical teaching practice (question: “ How do you think the master's degree has impacted your clinical teaching practice?”), The students' responses highlighted several crucial aspects related to training and significant learning. 30% mentioned concrete improvements in the teaching-learning process of their students, indicating improved educational quality. Additionally, 25% highlighted the transformative impact on their personal and professional perspective, including greater self-criticism and self-regulation in their teaching approach. 20% mentioned acquired tools and strategies that they apply in their practice, which makes them more effective educators. In addition, 15% noted improvements in the organization and planning of teaching activities, with the selection of relevant topics and clear objectives. Another 15% indicated that this impact extended to their work environment, generating positive changes in management for both students and teachers. 10% prepared for future teaching practices, and several mentioned a deep understanding of concepts and their practical application, as well as effective strategies to interact with students and support their learning.

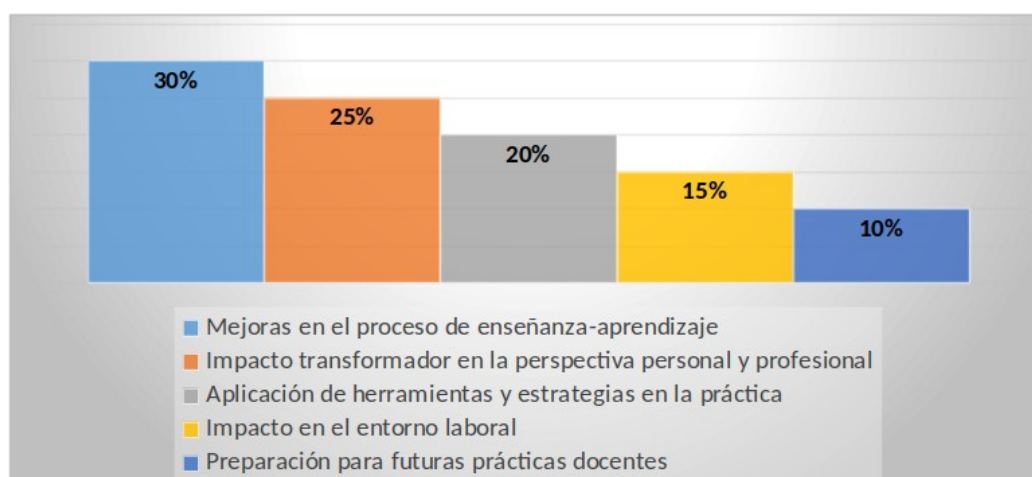


Figure 3. Impact of master in clinical teaching.

These findings correlate with what was presented by Pinilla (8) who emphasizes the positive impact of training and significant learning on teaching practice and the students' learning experience. Both teachers participating in training programs and educators who apply effective pedagogical methods can promote notable changes in their academic and research roles (8) . In addition, these programs also emphasize the importance of positive emotions in significant learning, promoting a more effective educational experience (9). The relevance of the tools and strategies provided by these programs is evident in the improvement of teaching organization and planning. Likewise, programs that connect higher education with the productive sector favor a transparent and objective evaluation, improving the learning experience for students. These results highlight the importance of continuous training and significant learning in the educational field, providing a solid basis for the constant improvement of the teaching-learning process.

Also as part of the effect, questions were asked about the changes that the students had begun to present (question: “ What are the changes evident in your students' learning when implementing significant learning strategies?”) The responses provided by the students (figure 4) reveal very interesting aspects in relation to significant learning strategies. A notable 40% of participants highlighted the palpable increase in students' motivation and interest when applying these strategies, which translated into a deeper

commitment to the learning process and a significant increase in their self-esteem. This phenomenon not only represents a momentary stimulus, but also establishes a solid foundation for sustained participation and long-term commitment.

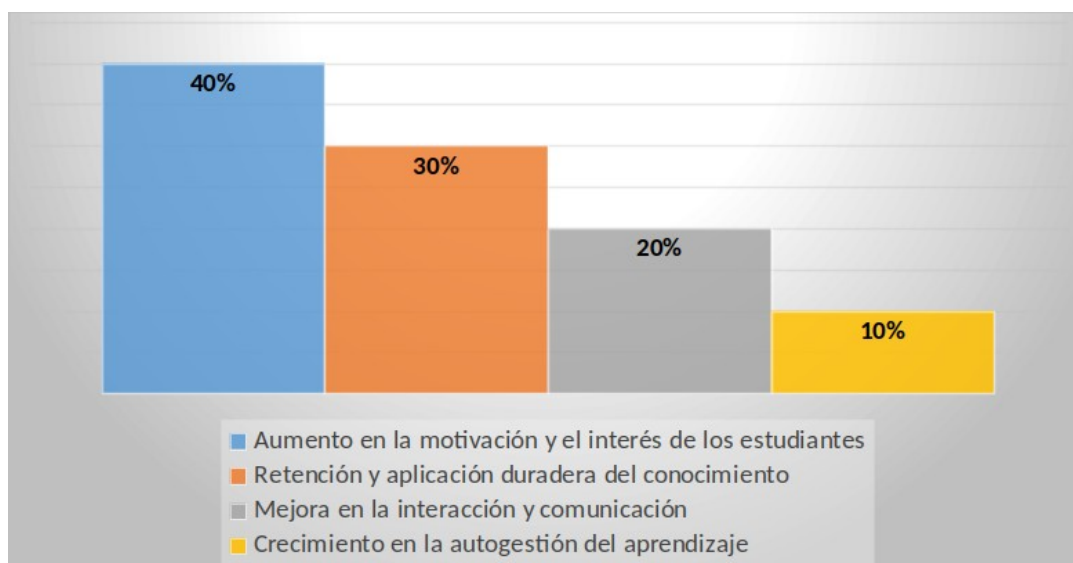


Figure 4. Changes in learning of studies when using significant learning strategies.

Additionally, 30% of students highlighted the ability to retain and apply the knowledge acquired over time. This finding suggests that significant learning strategies not only generate superficial understanding, but also foster lasting and significant learning that results in the effective application of knowledge in various situations and contexts, including daily practices.

In the area of interaction and communication, 25% of the participants highlighted a notable change. Students not only participated more actively in class, but also felt comfortable asking questions and expressing their ideas (10). Additionally, a decrease in interpersonal tensions was observed, indicating a more collaborative and respectful environment in the classroom. This increase in effective communication and active participation become key indicators of the success of significant learning strategies in improving the educational environment.

In terms of personal development and autonomy, 20% of students emphasized growth in self-management of learning (11). The students demonstrated greater self-determination, self-direction, and self-regulation in their educational process, suggesting greater independence and abilities to manage their own learning. This ability to take charge of your education not only enhances the student experience, but also lays the foundation for more effective and reflective professional practice in the future.

Furthermore, by linking these student experiences with academic literature, Duarte presents us with an essential synergy. Both the students' responses and the studies reviewed underline the undeniable connection between learning strategies, intrinsic interest and the development of effective self-management of learning. These elements intertwine to form a coherent and meaningful educational fabric, which not only boosts motivation and retention, but also equips students with the tools necessary for autonomous learning and effective application of knowledge in their daily practice (12).

Ultimately, this intersection between student experience and academic knowledge provides a deep and multifaceted perspective on the impact of significant learning strategies in medical education (13). These findings not only have immediate implications for the classroom, but also offer a solid foundation for future research and the continued development of effective pedagogical practices in the field of medical education (14).

Applicability.

They also asked about the difficulties in applying strategies in practice (question: "What are the barriers and difficulties that you have encountered in the application of significant learning strategies in your clinical teaching practice?"). The responses collected from students highlight various barriers that hinder the effective implementation of significant learning strategies (figure 5). Overlapping roles, especially in large group settings, were identified as a critical limitation by 25% of participants. The lack of intrinsic motivation on the part of students was mentioned by 20% as a significant barrier, as were institutional directives and the structure of class times, which affects the flexibility to adopt new educational strategies. In addition, 15% highlighted the lack of knowledge of teaching staff about these strategies, while 10% mentioned resistance to change on the part of both students and some teachers. Managing interpersonal conflicts and the need to strengthen teaching skills were also identified as obstacles by 10% of the participants.

These barriers are also mentioned by Jaramillo and García who highlight the complexity of the current educational landscape. Challenges persist in combining Information and Communication Technologies (ICT) with traditional methods, indicating the lack of solid evidence on the success of these practices, generating uncertainty about their effective application. This uncertainty is reflected in the difficulties encountered by students, such as barriers related to motivation, time restrictions and resistance to change (15-16).

This detailed analysis of barriers, supported by literature and actual student experiences, provides insight into the challenges medical educators face in implementing significant learning strategies. These findings not only offer a deep understanding of the current educational terrain, but also raise fundamental questions about how to overcome these barriers to improve the quality and effectiveness of medical education in the future (17).

But, just as there are barriers, we also have factors that help us in the application of strategies (question: "What are the facilitating factors that benefit the application of significant learning strategies in your clinical teaching practice?"). Student responses revealed several facilitators for the effective implementation of significant learning strategies (Figure 6). 20% of the participants highlighted the importance of favorable conditions, such as adequate schedules and small groups, while 15% mentioned the value of technology and experiential learning in the educational process. 10% highlighted the relevance of specific training in medical education and the recognition of each student's individual learning strategy as key facilitators. Furthermore, 10% stressed the need for continuous feedback and improvements based on students' suggestions, and another 10% highlighted the importance of students' positive attitude and willingness.

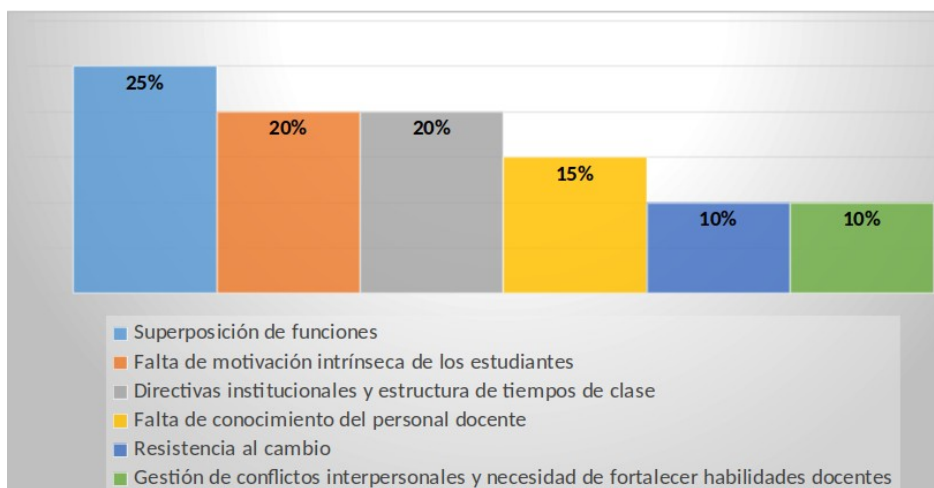


Figure 5. Barriers and difficulties.

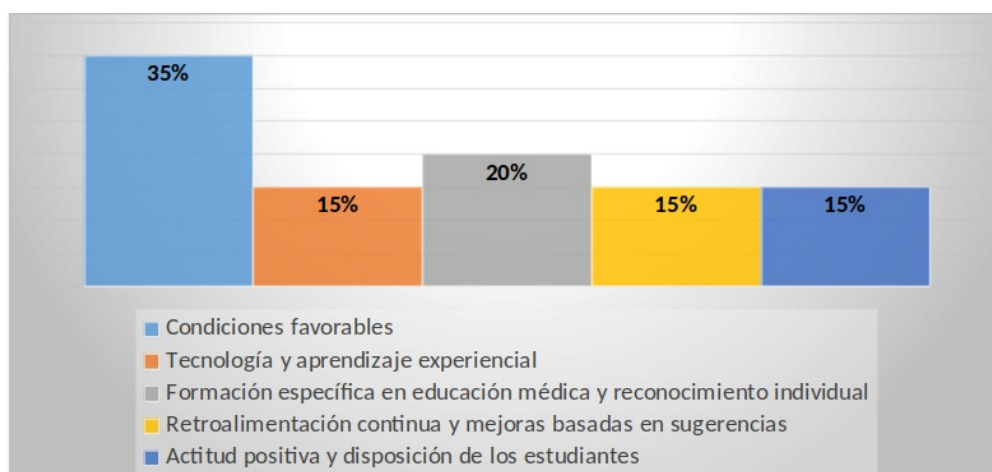


Figure 6. Facilitating factors.

The above results align with the findings described by Moreira and later by Delgado. Both highlight the active participation of students and their intrinsic motivation as fundamental elements, along with teaching strategies that maintain student interest. The adequate incorporation of pedagogical resources, especially virtual tools, is identified as essential for an effective enrichment of the teaching-learning process, and conducive conditions, such as small groups and times dedicated to teaching, are mentioned as facilitators (18-19). A clear understanding of the concept of significant learning is considered crucial, as is the ability to adapt strategies to the individual needs of students (11).

In the specific context of medical education, specialized training in this area is presented as an essential facilitator, and the importance of continuous feedback from students and the ability to make improvements based on their suggestions is highlighted (20). Furthermore, factors such as the positive attitude and disposition of students are identified as essential elements for the success of these strategies. Together, these facilitators contribute significantly to the effective implementation of significant learning strategies in various educational environments, providing elements to take into account for strengthening learning processes.

On the other hand, each student has a different work reality, which is why we delve into the differences in the application of strategies (question: “ Are there differences in the application of significant learning strategies according to the context of teaching clinical practice? Explain) your answer and, if yes, mention some of these differences.”). The responses reveal diverse perspectives on the application of significant learning strategies in clinical and educational settings (Figure 7). 50% of students recognize substantial differences between classroom and clinical practice, including variations in learning objectives, conditions, and diversity of students. 15% believe that, despite these differences, students' intrinsic motivation and desire for knowledge are the key factors for long-term learning and that strategies can be adapted to both contexts. Additionally, 25% highlight differences in goals and conditions, allowing for a more individualized approach in the clinical setting.

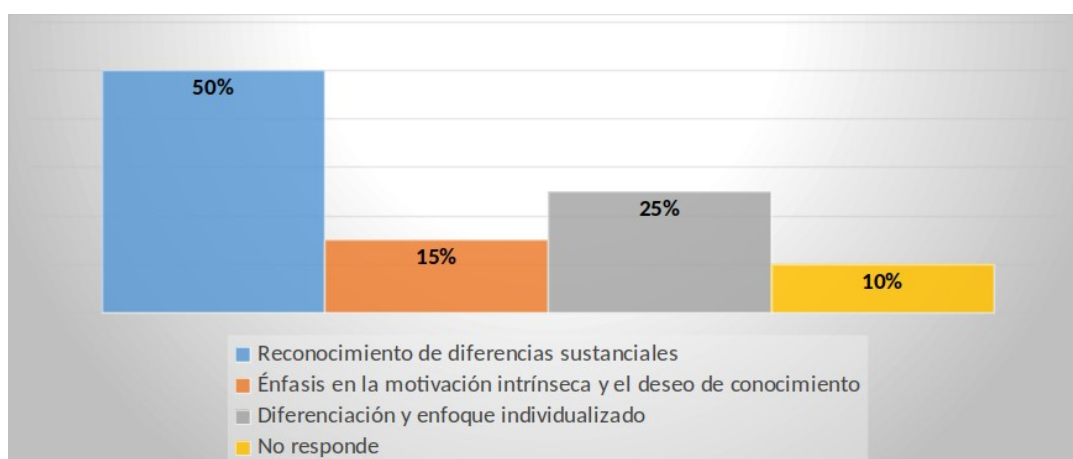


Figure 7. Differences in the application of strategies.

These observations align with the findings of Varela and Estrada, who highlight the importance of considering individual characteristics of students when selecting teaching methods. Both sources emphasize the need to update and adopt innovative strategies to facilitate learning, implying the constant search for effective pedagogical methods adapted to the educational context (13, 21). The preparation of action plans with clear and measurable learning objectives is highlighted as a fundamental aspect, indicating the need to establish concrete goals to guide the educational process. Furthermore, both instances emphasize the transformation of teaching-learning processes through the design of environments and the integration of information and communication technologies, underscoring the relevance of modernizing pedagogical methods to promote meaningful and effective learning (22,23). Finally, both sources highlight the importance of having adequate conditions and tools for the educational process, which includes the availability of resources and environments conducive to learning. Despite contextualized differences, there is a general consensus on the need to apply pedagogical principles in various educational situations to achieve effective and significant learning.

Feedback

The importance of support and feedback must be considered to optimize significant learning strategies (question: “ Have you received feedback from your colleagues or supervisors about the application of significant learning strategies in your clinical teaching practice? If so, what has this feedback been like?” The students' responses (Figure 8) reveal the scarcity of structured feedback on the application of significant learning strategies in their clinical teaching practice, with 75% of participants indicating that they have not

received feedback from colleagues or supervisors. possibly due to ignorance of this concept. Despite this lack, 15% mention having received informal approving comments or suggestions from their colleagues or supervisors, while 10% highlight the positive feedback provided by students, which demonstrates its positive impact on the learning process. . These findings coincide with bibliographic reference articles that highlight the fundamental importance of feedback in education and evaluation. The articles emphasize their essentiality in providing accurate information about student performance and understanding, reinforcing their role as a valuable tool to guide the learning process. Although formal feedback may be limited, the existence of approving comments and informal suggestions, as well as the appreciation of positive feedback from students, highlight the need for more active and structured teaching support to optimize students' academic development in the classroom. context of medical education (5) .

Implementation

Finally, we asked about strategies to implement significant learning in clinical practice (question: " What are the strategies that you consider can optimize or favor the implementation of significant learning in your teaching clinical practice?"). The responses of the master's students highlight various key strategies to implement significant learning in university teaching (figure 9). 15% of the participants highlight the importance of adapting these strategies to early stages of training, focusing on technical practices and protected schedules for students. Furthermore, 10% recognize the relevance of understanding students' cognitive resources, highlighting the need to know their preparation, reading and practice methods to optimize significant learning. 20% emphasize the need to communicate this concept to colleagues and supervisors, advocating collaboration and the progressive implementation of strategies based on significant learning. 25% of the responses highlight the creation of a positive learning climate and the construction of communities of practice, encouraging student participation, collaborative work and the development of interpersonal skills.

The bibliographic reference articles corroborate these findings, focusing on strategies that allow students to understand and apply knowledge effectively, avoiding simple memorization. Both emphasize the need to adapt to pedagogical changes and use tools that promote the relevance of learning (24). Communication and awareness about significant learning are essential, as indicated by the study responses, as is creating a positive learning climate and forming communities of practice, as highlighted in the articles. In addition, the importance of strategies such as detailed planning, formative evaluation and other various techniques to facilitate significant learning in university contexts is emphasized (24).

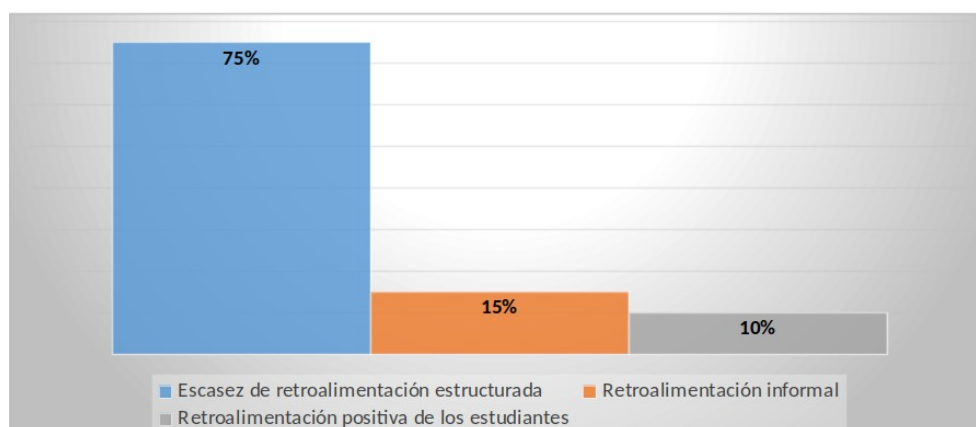
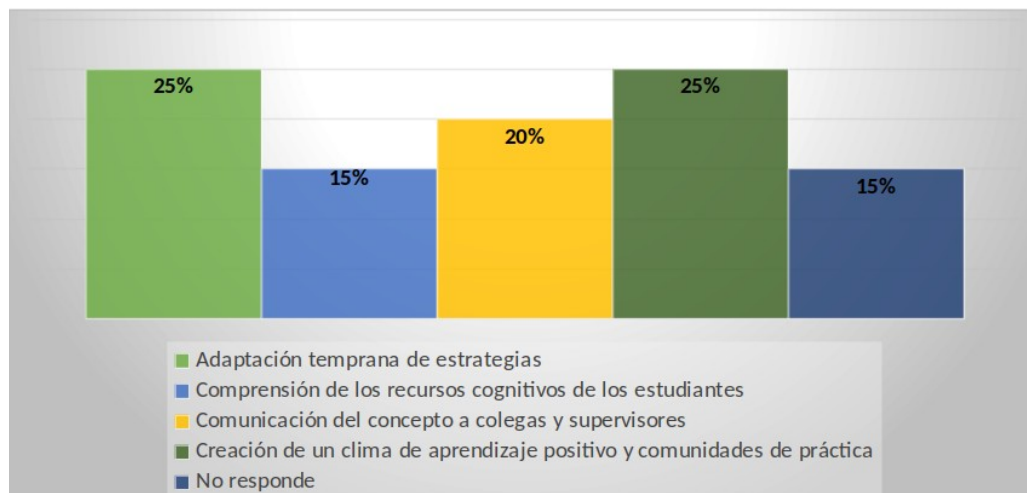


Figure 8. Feedback of colleagues and supervisors about the application of strategies.



Together, these sources converge on the need to adopt effective pedagogical strategies that promote active and significant learning in higher education, evidencing a shared understanding of the importance of these approaches to improve the quality of teaching and learning in the university setting (11).

4. Discussion

significant learning continues to play a very important role in the development and construction of learning. Specialized training processes must have a special emphasis on the expansion and management of this concept for professionals who are continuously training. At this point we join the global recommendations presented by the interviewees during this project carried out.

Teacher selection, which represents 15% of the recommendations, emerges as a main concern; Students propose not only avoiding monotonous or overly advanced teachers, but also incorporating alumni who provide a fresh and practical perspective in the classrooms. This is intertwined with the need, emphasized in both documents, to maintain a high level of commitment and motivation, which comprises 10% of the recommendations. Furthermore, 15% of practical experience stands as fundamental, urging the inclusion of real practices to consolidate the knowledge acquired. The implementation of workshops and simulations, along with other practical strategies, also resonates with 15% relevance in both sources. The expansion of the educational scope beyond clinical practice, 10% in the suggestions, aligns with the need to structure programs that develop competencies, a central point emphasized in both documents. Likewise, delving deeper into Ausubel's theory, with 5%, is revealed as an essential tool for significant learning, an idea that integrates perfectly with the need to provide practical experiences.

These collective findings support an integrative approach in medical education, based on the careful selection of teachers, maintaining student engagement, and applying practical strategies to ensure meaningful and advanced learning.

5. Conclusions.

- significant learning continues to play a crucial role in the development and construction of knowledge in medical education. It is essential that specialized training processes focus on expanding and promoting this type of learning among professionals in training.
- Maintaining a high level of student commitment and motivation is essential. This not only involves choosing the right teachers, but also implementing strategies that keep students interested and engaged in their learning.
- Practical experience and the incorporation of real practices are essential to consolidate the knowledge acquired. The inclusion of workshops, simulations, and other hands-on strategies can be beneficial for medical students.
- Expanding the educational scope beyond clinical practice is a necessity. This implies the structuring of programs that develop competencies and skills beyond purely clinical aspects.

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