

The Use Of David Ausubel's Theory Of Meaningful Learning In Professional Health Education

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Abstract:

Education consists of the acquisition and updating of knowledge, transforming individuals and environments. David Ausubel's theory of meaningful learning highlights the importance of integrating new knowledge into the learner's practice. For learning to be effective, educators must consider students' previous knowledge, creating an environment that favors the connection between new information and established concepts. Meaningful learning, unlike rote learning, results in deep and lasting understanding. This approach promotes the practical application of knowledge, especially in complex tasks, and transforms the relationship between teacher and student into an active collaboration. In this context, the main objective of this study is to synthesize the scientific production on the application of the Theory of Meaningful Learning in the teaching-learning process in health. The following research question was raised: What is the scientific production about Ausubel's Theory of Meaningful Learning in the teaching-learning process of health professionals? The search was carried out in the Scielo, LILACS and MEDLINE databases, focusing on articles from the last 10 years, and used the keywords "health education" OR "teaching" OR "Teaching in the health area" AND "meaningful learning" and their equivalents in English. The application of the theory of meaningful learning in professional health education highlights the importance of connecting new knowledge to students' previous experiences, promoting more effective and lasting learning.

Key Word: Teaching; Apprenticeship; Meaningful Learning; Health.

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I. Introduction

Education is based on the human need to acquire and update knowledge, allowing the transformation of the individual and the environment around him. This dynamic involves the active participation of teachers and students, and interaction is necessary for the construction of meaningful knowledge. Learning becomes truly effective when new knowledge is integrated into the learner's practice. The Theory of Meaningful Learning (TAS), proposed by David Ausubel, highlights this relationship between knowledge and experience, emphasizing the importance of reflection in the formation of the individual. Thus, the educational process is a continuous cycle of action and reflection¹.

Meaningful learning occurs when new content relates in a substantive and non-arbitrary way to what the learner already knows. This idea emphasizes that, for learning to be effective, educators need to consider the students' previous knowledge, called subsumers, thus creating an environment that favors the connection between new information and already established concepts². While traditional learning involves memorizing information

without comprehension, meaningful learning results in deep and lasting understanding, and is therefore more effective³.

Such subsumers serve as a basis for understanding and retaining new information. The material to be learned should be logically and psychologically relevant, fitting into the student's cognitive structure in a way that makes sense and relates to their previous experiences. That is, the content must be integrated into the learner's cognitive structure in a logical and not literal way. Meaning is considered potential when the material is coherent and relates to the subject's individual experiences, allowing for deeper understanding. Thus, the transformation of logical meaning into psychological meaning is fundamental for effective learning⁴.

The assimilation of new information provides significant benefits, particularly in the practical application of knowledge in complex activities, such as the analysis of clinical cases in the health area. This pedagogical model promotes the practical use of knowledge, facilitating its integration and effective valorization. By establishing connections between new knowledge and previously acquired information, it is possible to build more comprehensive and profound concepts. In addition, interaction and experimentation intensify the learning process, increasing the probability of obtaining positive results. In this way, this approach transforms the relationship between teacher and student into an active collaboration, where both participate as co-authors in the continuous learning process⁵.

In this context, the main objective of this study is to synthesize the scientific production on the application of Ausubel's TAS in the teaching-learning process in health. The specific objectives aim to (1) explore different aspects of the application of TAS in the context of health education; (2) to analyze the implementation of Ausubel's theory in training courses for health professionals; and (3) analyze how meaningful learning influences the retention and application of knowledge in practical situations.

This study is justified by the need to improve the training of health professionals in a context of complexity and demand for updated knowledge. Ausubel's TAS offers an approach that facilitates the retention and application of essential knowledge, contributing to the effective practice of these professionals. Investigating the scientific production on this theory allows us to identify gaps and opportunities for implementation in health curricula, promoting a more contextualized teaching. Thus, it aims to positively impact pedagogical practice and contribute to quality education in the health area.

II. Material And Methods

An integrative literature review was used in the elaboration of this study, which consists of a research methodology that allows the analysis and synthesis of evidence from different studies on a given topic, to provide a comprehensive overview of existing knowledge. Through it, academic production is identified and evaluated, while the findings are also integrated to contribute to the theoretical and practical advancement of the area in question⁶.

This study aims to answer the following research question: What is the scientific production about Ausubel's TAS in the teaching-learning process of health professionals? To investigate this question, we analyzed articles indexed in the Scientific Electronic Library Online (SciELO), Latin American and Caribbean Literature on Health Sciences (LILACS) and MEDLINE databases, with emphasis on the production published in the last 10 years. The search was carried out using the combination of the keywords through the crossing "health education" OR "teaching" OR "Teaching in the area of Health" AND "meaningful learning" and their equivalents in English.

The exclusion criteria were studies that did not fit the stipulated period, that did not address the research question or that were not available for free access to the full text. In addition, articles that dealt with audiences other than the delimited one, specifically those that addressed areas outside the health context, were excluded, thus ensuring the specificity and adequacy of the reviewed material to the theme in question.

III. Result

After applying the pre-established inclusion and exclusion criteria, as well as excluding duplicate studies, 10 studies were selected to compose the sample. Chart 1 details the results.

Chart 1. Summarization of the studies included in the sample

Study	Author (Year)	Title	Methodology	Results	Database
E1 ¹	Sousa, Formiga, Oliveira, Costa, Soares (2015)	A utilização da teoria da aprendizagem significativa no ensino da Enfermagem	Literature review	Identification of educational practices that promote meaningful learning in nursing education, highlighting the improvement in students' understanding and retention of knowledge	SciELO

E2 ⁷	Agra, Formiga, Oliveira, Costa, Fernandes, Nóbrega (2019)	Analysis of the concept of Meaningful Learning in light of the Ausubel's Theory	Qualitative study	Conceptual analysis that relates meaningful learning to Ausubel's theory, highlighting the importance of integrating new knowledge with existing knowledge for deeper and more lasting learning	SciELO
E3 ⁸	Ramos Serpa, López Falcón (2015)	La formación de conceptos: una comparación entre los enfoques cognitivista e histórico-cultural	Comparative study	Discussion about the formation of concepts in the cognitivist and historical-cultural approaches, concluding that both have distinct benefits in education, with Ausubel's approach promoting a more structured and meaningful learning	SciELO
E4 ⁹	Costa, Tibúrcio, Melo, Leite, Dantas, Torres (2018)	Construção e validação de Curso de Suporte Básico de Vida a distância	Applied research	Validation of a distance learning course based on Ausubel's theory, showing that meaningful learning facilitates the assimilation and practical application of the contents by students	LILACS
E5 ¹⁰	Michelena (2016)	Una óptica constructivista en la búsqueda de soluciones pertinentes a los problemas de la enseñanza-aprendizaje	Theoretical review	Proposals for solutions to educational problems using a constructivist approach, highlighting the relevance of Ausubel's theory for the creation of more meaningful learning experiences	LILACS
E6 ¹¹	Alves, Santos, Dantas, Martins, de Oliveira Salvador, Assis (2015)	A pedagogia vivencial humanescente e a teoria da aprendizagem significativa	Qualitative study	Relationship between experiential pedagogy and Ausubel's theory, indicating that experiential learning experiences promote a more meaningful and integrated assimilation of the contents	LILACS
E7 ¹²	Distler (2015)	Contribuições de David Ausubel para a intervenção psicopedagógica	Literature review	Analysis of the contributions of Ausubel's theory in psychopedagogical contexts, highlighting the importance of the organization of prior knowledge for the effectiveness of psychopedagogical intervention	LILACS
E8 ¹³	Aliakbari, Parvin, Heidari, Haghani (2015)	Learning theories application in nursing education	Empirical study	Application of several learning theories, including Ausubel's, in nursing education, showing that meaningful learning improves information retention and the practical application of acquired knowledge	MEDLINE
E9 ¹⁴	Tian, Zhang, Zhang, Dai, Lin (2020)	Application of Ausubel cognitive assimilation theory in teaching/learning medical biochemistry and molecular biology	Experimental study	Application of Ausubel's cognitive assimilation theory in the teaching of biochemistry and molecular biology, resulting in deeper learning and students' ability to apply complex concepts in a practical way	MEDLINE
E10 ¹⁵	Bryce, Blown (2024)	Ausubel's meaningful learning re-visited	Critical review	Review of Ausubel's contributions to meaningful learning, highlighting the continued relevance of his concepts and the need to integrate new knowledge with students' prior knowledge base for effective learning	MEDLINE

Source: Prepared by the authors, 2024.

IV. Discussion

David Ausubel's TAS is based on the premise that learning occurs most effectively when new knowledge is integrated into students' existing cognitive structures, fostering meaningful connections between what is already known and what is being learned. In the contexts of professional health education, this theory is essential to facilitate a deeper and more lasting understanding of the contents^{1,7-15}.

This perspective is aligned with constructivism, which sees learning as a social construction, emphasizing that knowledge is acquired through the interaction between cognitive and social aspects, reflecting the contributions of theorists such as Vigotsky and Piaget¹⁰. However, the theories of Vygotsky and Ausubel present important differences, especially in the relationship between learning and development, where Ausubel emphasizes the relevance of the student's previous cognitive structure, while Vygotsky focuses on social interaction as a mediator of learning^{2,3,10}.

In this context, significant learning stands out, which occurs when new information is connected to the individual's existing cognitive structure. Ausubel points out that effective assimilation requires the presence of "subsuming concepts", which anchor and integrate the new knowledge. If these connections are not made, learning becomes superficial. Ausubel's theory, aligned with Paulo Freire, emphasizes the importance of respecting and using the student's prior knowledge to create a stimulating and meaningful educational environment^{2,3,16}.

The importance of considering prior knowledge in a collective way is highlighted, integrating the students' experiences within the classroom and in the school context in general. The formation of concepts must be continuous, occurring throughout the individual's life, and be adapted to the levels of intellectual maturity of the learners and to the specific objectives of teaching⁸.

There are three main conditions for learning to be meaningful: the student's intention to learn, the availability of relevant elements in the cognitive structure, and the relevance of the material to be learned. This reinforces the need for teaching strategies that contemplate the particularities of students' prior knowledge, allowing for more lasting and applicable learning^{12,15}.

Meaningful learning occurs when the student can express a concept through several forms or symbols equivalent in meaning, without depending on a single specific way of expression. According to Ausubel, this ability to convert and compare different representations indicates a true understanding of the content. The limitation to a specific form of expression, in contrast, suggests mechanical rather than meaningful learning. Thus, encouraging students to generate multiple representations of a concept helps to refine and consolidate knowledge⁴.

The formation of concepts should not be seen only as a theoretical issue, but as an essentially human and social practice. Education should prepare individuals for life, enabling them to use knowledge to transform their realities and contribute to collective well-being. This process involves an ethical dimension, where teaching should be directed to promote humanitarian and collective interests⁸.

Such a theory has a positive impact on the retention and application of knowledge in practical situations. Studies show that learning that is anchored in prior knowledge facilitates the retention of information and its application in practical contexts. For example, a postgraduate course in palliative care used the previous experience of nurses to analyze clinical cases, integrating theoretical knowledge with practice¹.

It is noteworthy that theoretical approaches to meaningful learning vary according to the perspective adopted. The behaviorist conception focuses on the repetition and reinforcement of the information transmitted by the teacher, while the cognitive approach promotes the student's autonomy in the construction of their own knowledge. The social perspective emphasizes the interaction between the student and the environment, and the humanistic approach values the student's creativity and freedom in the learning process⁷.

The use of TAS, as observed in studies in other areas, reveals that some teachers understand "significant" as something of interest to the student, distorting the true meaning proposed by Ausubel. The term "meaningful" in Ausubel's theory refers to the cognitive relevance of the content to the student, considering their ideas, previous experiences, and intellectual maturity. It is not only about the subjective importance for the student, but about how the new content connects to their preexisting cognitive structure¹⁻³.

This learning, which is unique and personal, is linked to the individual structure of each person and can both transform the individual and be transformed by him. Among the methods that facilitate this construction of knowledge, progressive differentiation, which allows the evolution of concepts as they interact with new information, and integrative reconciliation, which establishes connections between ideas and concepts already existing in the learner's mind, stand out. These processes help to identify similarities and differences between related ideas⁵.

Meaningful learning is not just a matter of transferring information but involves building knowledge through meaningful and relevant interactions. Thus, according to Ausubel, learning should be intentional and aimed at connecting new content to previous knowledge, favoring retention and application in practical situations^{2,3,15}.

In this sense, pedagogical adaptation is necessary for its implementation. While in traditional approaches the teacher is seen as the main source of knowledge, in contemporary approaches, the focus is on facilitating learning, promoting students' autonomy and critical capacity. This paradigm shift is essential to adapt teaching to the new trends and needs of students¹¹. Educators must be trained to identify students' previous conceptions and use strategies that promote the construction of new knowledge in a meaningful way².

Adequate mediation for the teaching of concepts depends not only on the technical content to be taught, but also on the pedagogical and philosophical preparation of educators. Teachers must be well-prepared to promote the formation of concepts in a practical way, integrating linguistic, social, and cultural factors into the teaching process. In addition, the interaction between colleagues and teachers is essential to reinforce collective and meaningful learning⁸.

The importance of student motivation and involvement in the learning process is also discussed, in which students' willingness to active learning needs to be cultivated and guided by teachers, which highlights the importance of continuous interaction between educators and students. This dynamic is crucial to promote a learning environment where students feel responsible for their own learning process¹⁴.

In this sense, it is emphasized that the training of teachers is essential for them to mediate the learning process effectively, promoting an environment where the student feels motivated and able to build their own knowledge. This pedagogical approach must be able to integrate linguistic, social, and cultural factors, ensuring that all students can benefit from learning⁸⁻¹¹. When educators create learning environments that encourage active participation and critical reflection, they help students make meaningful connections between what they are learning and their previous experiences¹⁵.

Teaching should be designed in such a way as to integrate theory and practice, enabling students to apply the knowledge acquired in real situations. This integration is vital, since health education requires theoretical understanding added to the ability to apply knowledge in a practical and reflective way¹³. Thus, it is suggested that for its implementation, it is necessary to adapt pedagogical strategies to promote teaching that not only transmits information, but also engages students in the active construction of their knowledge^{1,8,9,11}.

Active methodologies, such as Problem-Based Learning (PBL) and Problematization Methodology (PM), are often used in line with Ausubel's theory. These methodologies start from real or fictitious problems to stimulate the critical-reflective teaching-learning process, where the student actively participates in the construction of his knowledge¹.

It is mentioned that the application of TAS contributes to the effectiveness of workshops, helping participants to understand the relevance of considering the previous experiences of professionals. This approach encourages debates that facilitate learning, aligning with the reality of nurses. However, the responsibility for expanding their knowledge and improving practice lies with each professional, based on what seems relevant to them¹⁷.

Accordingly, it is emphasized that the objective of health education should be the promotion of autonomous learning and the training of professionals capable of continuously updating themselves. The need for active learning is pointed out to ensure that students retain but are also able to apply the knowledge acquired. Thus, the implementation of student-centered teaching methods, such as PBL, can help establish significant links between previous and new knowledge, which is fundamental for meaningful learning¹⁴.

The learning process takes place in stages, in the initial phase, "imagining experiences", the student is encouraged to reflect on previous knowledge related to the central theme. In the next stage, "expressing imagination through projective techniques", the student takes an active role in the teaching-learning process, projecting his imagination and thinking. The phase of "promoting cognitive dissonance" and "relating the imaginary with the real" provides the confrontation and reinterpretation of concepts, facilitating a new understanding. These stages culminate in the "reinterpretation of concepts and practices, where previous knowledge is reassessed and updated^{2,3,11}.

Meaningful learning implies that new ideas, concepts, and propositions can be absorbed, if they are lucid and accessible, serving as fundamental reference points for initial understanding. At the same time, this new knowledge modifies cognitive structures, amplifying the cognitive schemas that lead to the assimilation of more knowledge¹⁸.

Thus, there is a need for teaching that is contextualized and relevant to the learner. Ausubel's proposal emphasizes that learning should be connected to students' experiences and interests, which can increase their motivation and engagement. Educators are encouraged to adapt their teaching methods, considering the particularities and context of each student, promoting a more personalized education^{2,3}.

In this sense, to facilitate meaningful learning, the contents of health courses are often structured around real and practical problem situations. For example, what is exposed in a study used to teach Basic Life Support (BLS). This approach allows students to relate new information to familiar and practical contexts, reinforcing the relevance and retention of the knowledge acquired⁹.

In the context of nursing, TAS was applied to awaken critical reasoning through the resolution of clinical cases based on real situations, promoting the use of acquired knowledge, critical thinking, and quick and effective decision-making. The theory was also used in the elaboration of concept maps and in Gowin's V diagram to structure and understand knowledge in a meaningful way¹.

In addition, the retention and application of knowledge in practical situations is influenced by how content is presented and assimilated. The application of meaningful learning should be oriented towards the training of professionals who understand the theory and who can apply it in real work situations. Thus, the combination of learning strategies can provide a more complete education that is adequate to the demands of the health field¹³.

The alignment between theory and practice is essential to train professionals who can act competently and responsibly in different scenarios^{11,12}. The use of active and participatory approaches, which stimulate students' curiosity and motivation, is considered fundamental to promote meaningful learning. The combination of teaching strategies that consider the characteristics of students and their motivations is a recommended approach to ensure that future health professionals are prepared to face the challenges of practice¹³.

The logical and sequential structuring of the contents, as well as the repetition of problem situations throughout the course, helps students to consolidate their learning and to use it effectively in their professional practice⁹. Likewise, the stability of the meanings acquired is essential for the success of this implementation, making students active agents in their learning process¹¹.

Ausubel's theory suggests that knowledge acquired in a meaningful way is more stable and integrated, which facilitates its application in practical contexts and transfer to new situations. This interactive process between new and previous knowledge results in a more elaborate and richer cognitive structure⁷. Concept maps, in this context, are cited as tools to assist in the organization of knowledge and facilitate the construction of meaningful relationships between concepts. This technique allows students to visualize the interconnections between ideas^{12,15}.

In view of this, the importance of developing a critical and reflective capacity in students is also emphasized, which can also occur through the application of this theory, allowing them to act as co-authors in their teaching-learning process. This focus is especially relevant in health education, where professional practice requires technical knowledge in addition to critical and reflective skills¹¹.

A combination of learning theories, such as humanistic and cognitivist, should be sought to create an educational environment that favors teacher-student interaction, facilitates the development of problem-solving skills and student motivation. Thus, the effectiveness of the method depends on the ability of educators to adapt their approaches to the characteristics of students¹³.

It is important to recognize that while TAS offers a valuable framework for teaching, its application must consider social interactions and the context in which learning takes place. Vygotsky emphasizes that learning cannot be dissociated from social conditions, which suggests that health education should integrate historical and cultural aspects that influence the professional development of students¹⁰.

For learning to be meaningful, there needs to be a constructive integration between thought, emotion, and action, promoting human development. TAS highlights that any educational event involves an exchange of meanings and feelings between teacher and student. For the content to be potentially meaningful, it is crucial that the learner is predisposed to become affectively involved with the experience provided by the educational event²⁻⁴.

This approach improves knowledge retention, while facilitating its practical application, resulting in better prepared and competent professionals^{7,11}. In addition, the importance of organization to facilitate learning is added, as an effective strategy to help students make connections between concepts and facilitate the understanding of complex contents¹⁴.

Graphic organizations as didactic tools that can help in the representation of the relationships between concepts and promote learning, considering that these visual resources facilitate understanding, and help students to visualize the structure of knowledge, allowing a better retention and retrieval of information. The use of previous organizers, for example, is a strategy that can be employed to prepare the student for the assimilation of new contents, by offering a reference structure².

When students can relate new information to previously internalized concepts, knowledge transfer becomes more effective. This is evident in contexts such as palliative care training, where students' previous experience is used to discuss and analyze clinical cases, allowing for contextualized and relevant learning^{1,9,11}.

The adoption of a pedagogical approach that takes TAS into account can improve the effectiveness of teaching in professional health education. Since it only facilitates the assimilation of knowledge, as well as promotes the development of essential skills for professional practice, aligning with the contemporary demands of the health sector. Health education, based on this theory, can train professionals who are more critical, reflective, and capable of working in complex contexts¹³.

Despite such benefits, a criticism has been raised that while Ausubel usefully addressed students' prior knowledge, he did not sufficiently investigate how this prior learning was verified. He focused on static

conceptions about how ideas are organized, ignoring the dynamic and creative nature of memory. Memory is not a direct replication, and assumptions about prior knowledge often do not hold up. Therefore, the complexity of prior learning must be recognized, and education must be understood to be based on reciprocity and mutual understanding^{2,3,15}.

Finally, learning is not an isolated process, but rather a continuous construction that occurs within a social and cognitive context. By promoting the understanding of the cognitive structure of students and the importance of content relevance, it offers a basis for the implementation of teaching methodologies aimed at the effectiveness of learning and the training of professionals who are more qualified to work in various fields, including health³.

V. Conclusion

David Ausubel's literature on the application of TAS in professional health education reveals the importance of integrating new knowledge into students' existing cognitive structures, promoting connections that favor a deeper and more lasting understanding. The evidence that meaningful learning, when mediated by the consideration of students' previous experiences and knowledge, results in a more effective and applicable training, reinforces the need for teaching that respects the particularities of each learner.

In addition, the implementation of TAS in training courses for health professionals highlights the relevance of considering the intentionality of learning, the availability of relevant elements in the cognitive structure, and the relevance of the material to be learned. TAS should not be seen only as a theoretical issue, but as a process that involves meaningful and relevant interactions, stimulating the development of essential competencies for professional practice.

Empirical evidence suggests that this theory has a beneficial impact on the retention and application of knowledge in practical contexts. Within the scope of this area, methods that promote the integration of pre-existing knowledge with new knowledge, such as APB, emerge as highly effective strategies to foster the development of critical and reflective reasoning.

The adoption of TAS in professional health education contributes to the training of more critical and reflective professionals and facilitates a more robust and integrated understanding of knowledge. Therefore, pedagogical practice should direct its efforts to the construction of environments that promote self-directed learning and continuous training, ensuring that professionals in training are adequately prepared to perform their functions with competence and responsibility in complex and dynamic scenarios.

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