

POSITIVISM AND COMPLEXITY: INTERFACES AND INFLUENCES IN THE EDUCATIONAL CONTEXT IN THE UNDERGRADUATE NURSING PROGRAM

POSITIVISMO E COMPLEXIDADE: INTERFACES E INFLUÊNCIAS NO CONTEXTO DO ENSINO NA GRADUAÇÃO EM ENFERMAGEM

POSITIVISMO Y COMPLEJIDAD: INTERFACES E INFLUENCIAS EN EL CONTEXTO DE LA ENSEÑANZA EN EL PREGRADO EN ENFERMERÍA

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Objective: to identify the relationship among the proposals of the National Curricular Guidelines of the Undergraduate Nursing Course concerning the competencies and skills required for the training of nurses, and the theories of complexity and positivism. **Method:** this is a theoretical-reflexive study. **Results:** in the context of nursing education and training, the complex logic is inserted because of the need for dialogue among the different types of knowledge. Accordingly, positivism and complexity theory are regarded as guiding ideas of training, which demonstrates the fact that theories cannot be mutually exclusive, but end up coexisting and orienting the health training processes. **Conclusion:** the positivist matrix and the characteristics of a type of logic close to complexity theory can be identified in the several interfaces of the training process of nurses. That is why it is up to the training institutions, teachers and students to reflect on the contributions of each strand.

Descriptors: Nursing; Nursing Education; Teacher.

Objetivo: identificar a relação entre as propostas das Diretrizes Curriculares Nacionais do Curso de Graduação em Enfermagem no tocante às competências e habilidades requeridas para a formação do enfermeiro, e as teorias da complexidade e do positivismo. *Método:* estudo teórico-reflexivo. *Resultados:* no contexto do ensino e da formação do enfermeiro, a lógica complexa insere-se em razão da necessidade de diálogo entre os diversos saberes. Assim, o

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positivismo e a teoria da complexidade são visualizados como ideias balizadoras da formação, o que demonstra o fato de que as teorias não se eliminam, mas acabam convivendo e orientando os processos de formação em saúde. Conclusão: a matriz positivista e as características de uma lógica próxima da teoria da complexidade podem ser identificadas nas diversas interfaces do processo formativo do profissional enfermeiro. Por isso, cabe às instituições formadoras, aos docentes e discentes refletir sobre as contribuições de cada corrente.

Descritores: Enfermagem; Ensino de Enfermagem; Docente.

Objetivo: identificar la relación entre las propuestas de las Directrices Curriculares Nacionales del Curso de Pregrado en Enfermería con respecto a las competencias y habilidades requeridas para formar enfermeros, y las teorías de la complejidad y del positivismo. Método: estudio teórico-reflexivo. Resultados: en el contexto de la enseñanza y formación del enfermero, la lógica compleja se inserta gracias a la necesidad de diálogo entre los diferentes conocimientos. Así, el positivismo y la teoría de la complejidad son vistos como principios rectores de formación, lo que demuestra que las teorías no son eliminadas, pero terminan conviviendo y orientando los procesos de formación sanitaria. Conclusión: la matriz positivista y las características de una lógica próxima a la teoría de la complejidad se pueden identificar en las distintas interfaces del proceso de formación del enfermero. Por ello, incumbe a las instituciones educativas, los docentes y estudiantes reflexionar sobre las contribuciones de cada corriente.

Descriptores: Enfermería; Enseñanza de Enfermería; Docente.

Introduction

The contemporary society, also called the knowledge and information society, is characterized by constant transformations that impact the different living spaces of individuals. In this context of change, truths, laws and idealization of a general common good are questioned and surrounded by doubt, deconstruction and mistrust, enabling the break of absolute truths and the valuation of the complexity that involves human phenomena⁽¹⁾.

The multiplicity of ideas, judgments, views, concepts and ways of living make it very difficult to structure crystallized knowledge models, able to serve as a solid foundation for the interpretation of reality. The only certainty is that nothing is certain now; only fragments and multiplicity of knowledge, which are always partial and provisional⁽²⁾.

This continuous process of change incisively puts into question many established truths in various scenarios. One of such scenarios is the professional training in health. In this new context, this training needs to take into account the inseparability between theory and practice, the extended understanding of care and of man⁽³⁾. To this end, new teaching strategies need to be adopted to make training relevant to the present demands, to meet the need of building skills and

competencies not only in the technical field, but also based on a new ethical and political attitude.

In Brazil, after the approval of the law nº 9.349/1996, which establishes the guidelines and basis for national education, a change in the context of health education took place. The proposal of reforming the health education was the result of numerous discussions in national and international institutions. This proposal showed the need to reform the curricula of undergraduate courses, considered inadequate and traditional, especially to ensure the construction of the Unified Health System (SUS), in order to promote the organization of the content and the insertion of innovative methodologies. It was also necessary to promote a critical and reflective training, in which future health workers were able to adopt an active stance and criticism that qualified them to enter into and transform distinct realities⁽⁴⁾.

In the universe of the nursing profession within the context of collective work in health, changes in the process of training date back to the times when nursing-art became nursing-science. The construction of knowledge in this area has suffered a process of intensification of production, which has contributed to its support as a science. With that, nursing schools

had to evolve, mainly with regard to didactics and pedagogical practices, with emphasis on practical education⁽⁵⁾.

In the contemporary scenario of training in health, teaching abilities and skills becomes an important educational strategy, as this represents a form of orientation towards the design of pedagogical training proposals. The teaching of skills is a reality experienced in the current process of training of nurses. These are designed and defined based on the profile of the professional trained, the needs of the services, the historic, cultural and economic context and the theoretical influences that guide the training. In this sense, it is essential to understand that skills and competencies are grounded in paradigmatic concepts that guide the pedagogical proposal. Far from being a purely technical dimension, the skills and competencies bring forth ethical and political issues that define the prospects of training and of the professional in formation.

Recognizing, therefore, that paradigmatic aspects guide to building of skills and competencies of health/nursing workers, this study has as guiding question: what are the interfaces and which is the influence of positivism and of the theory of complexity present in skills and competencies for the training of nurses today?

This is a theoretical and reflective study on the perspective of contribution to the theoretical framework of the research project entitled "Teaching topics of Primary Health Care in the undergraduate Nursing course: Comparison between teaching strategies and learning" carried out in the Graduate Nursing Program at the Federal University of Rio Grande do Norte, Brazil.

For the search and analysis of the theme, a narrative review of literature was carried out in the following databases from May 2016 to March 2017: *Scientific Electronic Library Online* (SciELO), *Education Resources Information Center* (ERIC) and MEDLINE, via the CAPES Periodicals Portal. The texts analyzed and included refer to the problem studied in a comprehensive discursive perspective. In order

to foster the search of the researched articles, the following keywords were used: nursing, health training, positivism and complexity.

This theoretical reflection aims to identify the relationship between the proposals of the National Curricular Guidelines of the Undergraduate Nursing Course with regard to competencies and skills required for training nurses, and the theories of complexity, according to Edgar Morin, and positivism, from the perspective of August Comte.

Discussion

Below is the presentation of results and discussion based on guiding axes. Initially, we approach the positivist thinking of Augusto Comte and Edgar Morin's theory of complexity in Nursing teaching. Then, a reflection on the interfaces, approaches and differences of these theories in the studied context is done.

Positivism: Characterization and its Influences in the Context of Nursing Education

This theory has as one of the main representatives the French positivism of Augusto Comte, a line of thought that had profound repercussions in Europe during the 19th century. It was anchored on the idea that science is the only way to true knowledge production. This understanding has built the supremacy of science to the detriment of other forms of knowledge. In this way, the positivist method should extend to human and social studies⁽⁶⁾.

Positivist thinking has the rational organization of society as premise, in order to meet the need for stability. It admits only that the real, the true and the unquestionable is based on experience. In the context of education, positivism has offered relevant contributions to the school planning, to the use of vocational technology and application of scientific knowledge. It is argued, however, that purely vocational evidence brings as negative effect the possibility of affecting the students' intellectual talent. This interference occurs due

to the limitation that education, influenced by positivist ideals, incurs to the encouragement and development of critical thinking⁽⁷⁾.

In this sense, the prospect of positivistic education is intrinsically related to the maintenance and assurance of convergence identified as critical for the normal development of the society. The educational bases of this proposal highlight the idea of transmission, conservation and control of knowledge and opinions⁽⁸⁾.

Positivist ideas have led the knowledge to become fragmented, separated, with specializations based on disciplines that do not communicate to each other. Isolated in their specific areas, the disciplines do not allow a global vision of phenomena, always trying to simplify the human events by means of the scientific knowledge⁽⁹⁾.

It is understood that in the sphere of health sciences, positivist ideas are visible in the flexnerian paradigm. The paradigm is characterized by its model of disjunction/fragmentation, establishing limits and traps that surround the acts of thinking and knowing in health. By maintaining dichotomous standards, certain misconceptions, reductions and simplifications may occur, such as changing the part by the whole, separating and opposing theory and practice, the knowing and the doing, subject and object, mind and body, among other supposedly irreconcilable oppositions that ended up compromising, for a long time, the way to understand the world and oneself.

Health sciences, embedded in the trench of irreconcilable disjunctions and oppositions established by the reductive thought of classical science, assume scientific knowledge in its linearity, as a marker of its interventions before human illness processes. With its controller, hard and, above all, arrogant character, the positivist reason, rooted in strict rationality, submitted all the expertise and knowledge to the one considered the most evolved and with greater power of decipherment of things. Medical knowledge based on scientific rationale ended

up producing a design of body, illness and health strictly modern and Western.

In the context of nursing, positivist ideas are perceived since their institutionalization and definition as Modern Nursing. Works of Florence Nightingale, who guided the professionalization, show that, since its inception, nursing suffered strong influences of Comte's ideas. The Florence's view of care is influenced by the miasmatic-bacteriological theory and the positivist method, with regard to the determination of the facts and their relations perceived by the external senses⁽¹⁰⁾.

Positivist perspectives will drive the teaching process in nursing, which will be guided by the disciplines that make up a fragmented and highly specialized curriculum. This guidance, however, make it difficult and/or impossible the establishment of communication and work between different disciplines⁽⁷⁾.

In contemporary times, although progress is observed in some training areas, a curricular organization structured into separate disciplines that are incommunicable with other curriculum components is still noticeable in most of the educational institutions. The organization of a week for evaluations, the written tests as a standard evaluation method, and the tendency to address the content in lectures are remnants of an attitude of order, conservation and control of the positivist logic.

Complexity Theory and its Influences in the Nursing Education Context

To understand the complexity sciences, it is essential to recognize the existence of a simplifier paradigm, which separates what is united (disjunction) and unites what is separated (reduction). It is essential to be aware of the consequences produced by the paradigms that mutilate knowledge and disfigure the reality, and that, given the complexity of contemporary problems, have become insufficient to explain and solve the challenges experienced by *sapiens demens* in the current scenario⁽¹¹⁾.

The recognition that a mutilated thought produces mutilating actions calls for a reform of thought. This must be based on the principles of complexity, which should be understood as a heterogeneous fabric whose elements are inseparably linked. A fabric composed of events, actions, interactions, determinations and accidents that make up our phenomenal world^(11,12).

Understanding complexity as what it is, on the order of what needs to be woven together, invites us to realize the importance of inter- and transdisciplinary actions in the education universe. This cannot be perceived as an instrument of transmission of knowledge, but a tool for the process of reform of thought in which social subjects are able to reconnect scientific culture and humanistic culture and, therefore, perceive and act recognizing the complexity surrounding problems that afflict humanity.

In the context of health education, the complexity sciences allow fragmented and disjunctive models that produce health to be questioned, enabling dialogue between different forms of knowledge in the discussions on the future profile of the professional training. By enabling the specification of a new perspective on the health concepts through such dialogue, the complexity sciences point to the need to rethink the training strategies, in which individuals take responsibility for the process of building knowledge and for their own training.

The importance of organization and expertise to the development of science is notable, but recognizing the need for communication between disciplines is also important because, for teaching fragmented disciplines prevents the perception of the whole⁽¹³⁾.

The perspective of complexity from the point of view of nursing education offers a comprehensive and contextualized teaching, disregarding the linearity of facts⁽¹⁴⁾. In this sense, it allows for a broader view and suggests a cyclical and comprehensive analysis of the investigated fact.

The perception of the human being as a complex being requires an equally complex

care. Therefore, it is essential to consider the instrumentalization supported in various fields of knowledge and interaction between disciplines. The immobilization provided by the organizational structures of curricula, in most cases, prevents this interaction and consequently favors a fragmentary training⁽¹⁴⁾.

It is important to emphasize that it is necessary to make the knowledge become relevant. This happens when this knowledge is able to locate all the information and its context, which suggests the need to overcome the fragmentation present in the school context, because there is a tendency to separate the objectives from the contexts in which they are inserted. In this sense, it is necessary to train citizens capable of facing the problems of their time⁽¹⁵⁾.

A complex science has to overcome deterministic methods. Thus, the complex logic has to do with chance and disorder, with living with complications, with difference, breaking of closed and clear concepts, as well as the disruption of the principle of neutrality⁽¹⁶⁾.

These considerations are contrary to passivity, domestication and accommodation. Thus, the complexity suggests an emancipatory education. As universities represent one *locus* for education reform, they must occupy a privileged place in the formation of human beings facing this complex perspective.

In the context of nurses' education and training, the complex logic comes from the need for dialogue between different types of knowledge. The stimulus to the search, to reflection, consideration and approach between students and teachers, the negation of passivity and expanded interpretation of problems suggest a personal and collective emancipation.

Positivism, Complexity and Nursing Curriculum: Interfaces, Approximations and Divergences

In Brazil, the National Curriculum Guidelines for Undergraduate Nursing Education define the principles, fundamentals, conditions and procedures of nursing education to be applied

in the organization, development and evaluation of educational projects of undergraduate nursing programs. Therefore, the skills and competencies required for the formation of a nurse capable of working in different health care settings are one of the goals^(17,18).

In this training context, it is intended that nurses be given the knowledge to perform their activities with the following skills and competencies: health care, decision making, communication, leadership, administration and management, and continuing education^(17,19).

Concerning the performance in health care, nursing professionals are required to develop activities that address the various dimensions of care both individually and collectively. Therefore, it is necessary to think critically, analyze problems and find solutions to address them⁽¹⁷⁾. In this scenario, by assuming the objective, practical and clear perspective of problems, positivist ideas become insufficient to meet the complexity involved in the development of the competence presented here. Thus, complexity sciences represent a possibility of building competence. This is because their principles include the need for critical thinking, parasitized by uncertainty and guided by a new ethic of civilization in which the human condition can be considered in the scenarios of life of individuals.

In this sense, the training of a new nurse embraces the need for argument and confrontation against passivity and accommodation. Therefore, it is essential to train not only technically competent professionals but also critical, reflective and politicized ones. Therefore, it is necessary put into question the practice because the contents no longer meet the requirements of the labor market in the current context⁽²⁰⁾. Furthermore, professional careers have been subjected to the process of reviewing based on new requirements, and this involves adaptability to new, creativity, autonomy, communication, initiative and cooperation⁽²¹⁾.

Another key element in the projection of nurses' actions is the decision-making. The most appropriate practices must be selected,

taking into account the scientific evidence⁽¹⁷⁾. In this projection, the positivist perspective can be highlighted based on the orientation of actions based on science. However, accepting science as the only knowledge, as preached by the positivism, it is something reductionist and loses a considerable amount of knowledge that is not in the data. There are things that cannot be explained or verified by experience⁽⁷⁾. In contrast, the complexity considers the need to overcome deterministic methods.

Communication is a key element in the interaction between health professionals and the general public⁽¹⁷⁾. In the positivist perspective, communication is restricted to the admission and validity only of what is considered real, true and unquestionable. In the positivist scenario, communication is built in the logic of the one sending the message, and of the receiver. Thus, when there is *feedback*, there is communication, but this reduces the possibility of communication between individuals of different scenarios. In the context of complexity, by recognizing the plurality of ideas and communication strategies, communication enables individuals to express themselves based on their living territories, recognizing the relevance of antagonistic notions.

Regarding the leadership, administration and management, the need to work in the multidisciplinary team with commitment, responsibility and empathy stands out, as well as the need to take into account both the workforce and the material resources⁽¹⁷⁾. Thus, the positivist teaching prevents the development of this competence, since the secondary role given to students and teachers preclude active participation in the teaching and learning processes. Thus, the complexity theory represents a viable possibility, based on the proposal and reassertion of complicity between these subjects, surpassing the domestication of thought and linear organization.

About the last general competence cited in the document under review, continuing education, it is advised that nurses learn to learn⁽¹⁷⁾. Learning how to learn involves escaping from

the domestication of thought and acceptance of what is established; it is necessary to go further. From the positivist point of view, the idea of transmission, conservation and control is contrary to the requirement of the National Curriculum Guidelines for Teaching in Undergraduate Nursing Courses.

In this sense, the higher education teaching staff should teach their students to learn and to take action, rather than being only sources of knowledge⁽²¹⁾. In the school context, there is a predominance of content disclosure for the transference of information, whether in the form of speech, whether in lectures⁽²²⁾. This consideration reflects the position of teachers as beings endowed with knowledge and the exclusive subjects able to mediate the acquisition of knowledge. It suggests the teacher in terms of a god and the student as a mere spectator.

Therefore, it is understood that the major challenge for vocational training is the development of individual autonomy in close coalition with the collective. Formal education should be able to trigger a vision of the whole, both in the issue of interdependence and in the transdisciplinary perspective. It should also enable the construction of social change networks, with the consequent expansion of individual and collective consciousness⁽³⁾.

In short, the idea of complexity and reconnection of knowledge permeates the consideration of dialogical, recursive and hologramatic principles⁽¹⁴⁾. In the positivist perspective, the dialogical feature is grounded in science as the only explanation instrument. In the Comte's paradigm, recursive and hologramatic elements are based on the linearity of the facts.

Final Remarks

The training of modern nurses, considering the curricular structures and processes of teaching and learning adopted in Higher Education Institutions, receives influences of different theoretical and philosophical lines and reflects a historical and cultural process and the

shaping of science paradigms in societies. As for Nursing, training that addresses the needs of today's society involves the acquisition of skills and competencies to meet such needs. Thus, in the formation of these skills, the positivist and complexity theories are viewed as indicators of training. This demonstrates the fact that theories are not mutually exclusive, but end up coexisting and guiding the health training processes.

The reflection by the part of teachers on strategies adopted in the context of teaching and learning is relevant and is the premise of the study of the objectives outlined in the curricula. In addition to this reflection and study guided by the organizational, pedagogical and school structure, it is necessary to reflect on the roles of teachers and students, avoiding the distance between them.

The positivist matrix and characteristics of a logic that is close to the theory of complexity can be identified in the various interfaces of the training process of nursing professionals. Thus, training institutions, professors and students must reflect on the contributions of each chain. Considering the object of analysis and reflection pointed out in this article, it is wise to consider the needs to overcome rigid and inadequate models in nursing education.

A health science with complex basis can become a mediator of the multicultural dialogue by recognizing the importance of a science of reconnection between the different fields of knowledge. This reconnection is born from the awareness that the multiplicity of cultural experiences evokes several cognitive constructs and at the same time. Such health science will be also possible by questioning some of the epistemological protocols that, in simplified manner, have favored the codes of the official Western science.

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