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Environmentalization in Higher Education: Integrative Analysis of Publications in the healthcare Area

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ABSTRACT

Introduction: Curricular environmentalization in higher education requires a complex view of the multidimensionalities involved in environmental issues and integration between the teaching, research, extension and management sectors. **Objective:** The aim of this article is to discuss environmental inclusion in undergraduate courses based on an integrative analysis of articles dealing with the subject in the curriculum of health courses. **Methodology:** Articles were searched in three databases: the Portal of Periodicals of the Coordination for the Improvement of Higher Education Personnel (CAPES), the Network for Environmentalization and Sustainability in Higher Education (RASES) and Google Scholar. For this search, the following terms were used as descriptors: "Environmentalization in Higher Education", "Environmentalization-graduation-health", "Environmental education in health graduation", "Environmentalization, curriculum, higher education", "Environmentalization and curriculum in graduation", "Environmentalization and graduation". **Results:** The results relating to curricular environmentalization in higher education refer to 62 articles, of which only eight refer to health courses, which are discussed in depth in this article. The data was processed using qualitative textual analysis. **Conclusion:** The integrative analysis showed that, although curricular environmentalization in health courses is considered essential for these professionals due to the nature of the relationship between the area of training and the environment, it is not being implemented in order to deepen these intersections.

KEYWORDS

Graduation. Health. Environment. Curriculum.

Ambientalização no Ensino Superior: Análise Integrativa de Publicações na Área da Saúde

Resumo

Introdução: A ambientalização curricular no ensino superior requer uma visão complexa das multidimensionalidades envolvidas na problemática ambiental e a integração entre setores de ensino, pesquisa, extensão e gestão. **Objetivo:** O objetivo do artigo é discutir a inserção ambiental em cursos de graduação a partir da análise integrativa de artigos que tratam do tema no currículo dos cursos da área da Saúde. **Metodologia:** Foram rastreados artigos em três bases de dados: o Portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), a Rede de Ambientalização e Sustentabilidade no Ensino Superior (RASES) e o Google Acadêmico. Para esta busca foram usados como descritores os termos: “Ambientalização no Ensino Superior”, “Ambientalização-graduação-saúde”, “Educação ambiental na graduação em saúde”, “Ambientalização, currículo, ensino superior”, “Ambientalização e currículo na graduação”, “Ambientalização e graduação”. **Resultados:** Os resultados relativos à ambientalização curricular no Ensino Superior referem-se a 62 artigos, dos quais somente oito referem-se aos cursos da área da Saúde, que são aprofundados neste artigo. Os dados foram tratados por meio da análise textual qualitativa. **Conclusão:** Evidenciou-se, a partir da análise integrativa, que a ambientalização curricular nos cursos de Saúde, apesar de ser considerada imprescindível para esses profissionais, em virtude da natureza da relação entre a área de formação e o ambiente, não está sendo efetivada no sentido de aprofundar estas intersecções.

Palavras-chave: Educação Superior. Saúde. Contexto Ambiental. Currículo.

La ambientalización en la educación superior: análisis integrador de publicaciones en el área de la salud

Resumen

Introducción: La ambientalización curricular en la enseñanza superior requiere una visión compleja de las multidimensionalidades involucradas en las cuestiones ambientales y la integración entre los sectores de enseñanza, investigación, extensión y gestión. **Objetivo:** El objetivo de este artículo es discutir la inclusión ambiental en los cursos de graduación a partir de un análisis integrador de artículos que abordan el tema en el currículo de los cursos de salud. **Metodología:** Los artículos fueron buscados en tres bases de datos: el Portal de Publicaciones Periódicas de la Coordinación de Perfeccionamiento de Personal de la Enseñanza Superior (CAPES), la Red de Ambientalización y Sostenibilidad en la Enseñanza Superior (RASES) y Google Scholar. Para esta búsqueda, se utilizaron los siguientes términos como descriptores: "Environmentalisation in Higher Education", "Environmentalisation-graduation-health", "Environmental education in health graduation", "Environmentalisation, curriculum, higher education", "Environmentalisation and curriculum in graduation", "Environmentalisation and graduation". **Resultados:** Los resultados relativos a la ambientalización curricular en la enseñanza superior se refieren a 62 artículos, de los cuales sólo ocho se refieren a cursos de salud, que se analizan en profundidad en este artículo. Los datos se procesaron mediante análisis textual cualitativo. **Conclusiones:** El análisis integrador mostró que, a pesar de que la ambientalización curricular en los cursos de salud es considerada esencial para esos profesionales debido a la naturaleza de la relación entre el área de formación y el medio ambiente, no está siendo implementada para profundizar esas intersecciones.

Palabras clave: Graduación. Salud. Ambiente. Currículo.

CRediT

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1 Introduction

Human kind is undergoing an environmental crisis in contemporaneity that derives from how the interactions between humans and nature have developed, the most frequent of which is based on humans' dominance over the natural resources for the production of consumer goods. This use of resources has been perfected and has increased since the Industrial Revolution, which changed the means of production. Consequently, situations of pollution of nature have been increasingly more frequent, as has the depletion of part of the resources.

It is also a fact that society is undergoing a long transition phase in rules, values, and responsibilities that guide the relationship humans-nature, which requires changes in behavior along with moral, ethical, and cognitive principles. The intended harmonious relationship between humankind-nature are yet to leave the scope of intentions. That gives rise to the need for discussing environmental issues related to education, in order to help rethink scholarly education and seek new strategies to train professors, students, and managers to include the debate on sustainable practices based on curricular environmentalization, an essential component in education for citizenship.

The term curricular environmentalization is relatively recent in literature, having emerged in the 1980's, with the engagement of educators and managers committed to developing projects in the curricula of undergraduate courses, and based on a modern-day reference, the Curricular Environmentalization Network of Higher Education (ACES network), which was only created in 2002. Curricular environmentalization is understood as:

[...] a continuous process of cultural production intended for the education of professionals committed to the permanent search for the best possible relationships between society and nature, fulfilling the values of justice, solidarity, and equity, applying globally recognized ethical principles and respect to diversities (FIGUEIREDO *et al.*, 2017).

Curricular environmentalization in higher education seeks to translate the complex nature of social, ethical, biotic, and political dimensions, among others, driven by an institutional commitment resulting from the involvement of four essential segments in the academic setting: teaching, research, extension, and management. Environmentalization must be understood and incorporated as a continuous and dynamic process, based on the assumption that universities are "sustainable educational spaces", complying with what is set forth in Brazilian official documents and providing the university community with practical experiences, as well as principles, behaviors, and values (GUERRA; FIGUEIREDO; SAENZ, 2012).

There already is a promising movement in favor of curricular environmentalization at public and private universities, particularly in the Southern and Southeastern regions, while the Northern, Northeastern, and Mid-Western regions are taking their first steps towards the institutionalization of environmental issues, which we shall emphasize throughout this paper.

One of the principles of education for sustainability is founded on the promotion of cooperation and dialog between individuals, institutions, and environmental education agencies, with the purpose of creating ways of living that have lower impact on the environment and ensure quality of life to future generations.

In face of the emerging environmental issues, civil society has incorporated the environmental issue as a public topic, adapted to a sizzling global debate. Therefore, legislations, ordinances, standards, and federal agencies have been gradually created. The environmental agenda has entered the international and national agendas.

In Brazil, a highlight was the creation of the National Environmental Policy (PNMA), Law No. 6938/1981. Following PNMA, other initiatives emerged with the purpose of encouraging new regulatory proposals. The most relevant of them was the National Policy for Environmental Education (PNEA), Law No. 9795/1999 (BRASIL, 1981, 1999).

Environmental education in PNEA is understood as a facilitator of knowledges, skills, behaviors, and competencies, and is a mandatory and permanent component of educational processes, both formal and non-formal, which train the citizen through a process that must be inter-, multi-, and transdisciplinary, to be achieved using an integrated complex, systemic, and relational approach (BRASIL, 1999).

Although it is legally guaranteed, environmental education is a challenging practice considering how contemporary society is structured. In order for it to be successful, it is necessary to enable the scholarly community to play a leading role in sustainable practices, among other actions. The influence of Education Institutions is of unequivocal importance, in order to engage in the training of subjects that work in favor of sustainable environmental development and progress beyond isolated initiatives, which occur through lectures and marketing campaigns. However, it is necessary to foster educational projects and programs with effective proposals, both through their end activities (teaching-research-extension), and in the internal and external management of processes.

Article 15 of the National Curricular Standards for Environmental Education (DCNEA) establishes, specifically regarding curricular organization, the commitment of higher education institutions to socio-educational, environmental, artistic, cultural, gender, ethnicity, race, and diversity issues. These elements must be inserted in the Course Pedagogical Projects (PPC), in the Pedagogical Project (PP), and in the Institutional Development Plan (PDI) in the case of Higher Education Institutions. Concerning the environmental issue, a highlight is the approach to topics such as life communities, biomes, and territories where the institutions are located, as well as values of cooperation, solidary relationships, and respect for the environment. Following this line, DCNEA ratifies that knowledges of environmental education in Higher Education might occur in a transversal manner across the curriculum (BRASIL, 2012^a).

Therefore, DCNEA's establish the social role of HEIs in their commitment to practices that are environmentally sustainable and that encourage the academic community to critically

reflect upon environmental issues. This commitment must be present in official documents, internalized as permanent internal policy, and must be able to promote higher quality of life and wellbeing to the population as well as protection to ecosystems.

On the other hand, the Law of Guidelines and Bases of National Education - LDBEN, Law nº 9394/96, proposes to link education to the labor world and to the exercise of citizenship, together with the demands of the contemporary world, among which are the environmental issues. Therefore, this law establishes the creation of projects, activities, and actions that contemplate this objective in Higher Education. Moreover, as it ensures that education is focused on the labor market, its relationship with environmental issues cannot be overlooked, nor can be the need to develop competencies and skills among students who shall work towards these changes (BRASIL, 1996).

Therefore, a question arises as to how the academic education of university students in the healthcare area provides a systemic view of the contemporary environmental problem. Based on this problem, the aim of the present study is to discuss the environmental inclusion in graduation courses based on an integrative analysis of papers that address the topic of course curricula in the Healthcare area. The integrative analysis followed the proposal by Whittemore and Knafl (2005).

Whittemore and Knafl (2005) define that integrative analysis is about summarizing empirical and theoretical knowledges that allow a better understanding of a phenomenon, based on evidence. Integrative review has been used to define concepts and review theories or analyze methodological issues. The aim is to synthesize the findings related to the objective of this study, in a comprehensible and integrated manner, in order to help have a new understanding of the phenomenon studied.

2 Method

The methodological approach is based on bibliographic survey and document analysis, as well as reading about guidelines of basic education, environmental education, and specific subjects related to courses of the Healthcare area that are the object of our study: Nursing, Dentistry, and Pharmacy.

Bibliographic research is characterized as Integrative Analysis. Whittemore and Knafl (2005) describe it as summarizing empirical and theoretical knowledges that allow a better understanding of a phenomenon, based on evidence. The authors propose five stages: 1) The stage when the Problem is Identified; 2) The stage of bibliographical research; 3) The Stage of Data Analysis (with data reduction, display, and comparison); 4) Final design and Checking (interpretation); 5) Submitting the results in order to contribute with a new understanding of the phenomenon studied.

The bibliographic research allowed us to come closer to the understanding and thought of some authors who have already tackled this topic in their papers. Through this

research method, we performed an integrative analysis of the papers that address the topic, which allowed to characterize this scientific production available at the Portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Portal of Journals of the Brazilian Federal Agency for Support and Evaluation of Graduate Education – CAPES), at the Rede de Ambientação e Sustentabilidade no Ensino Superior (Environmentalization and Sustainability Network in Higher Education - RASES), and at *Google Scholar*. The following terms were used as descriptors of this search: “Ambientação no Ensino Superior” (Environmentalization of Higher Education), “Ambientação-graduação-saúde” (Environmentalization-graduation-health), “Educação ambiental na graduação em saúde” (Environmental education in healthcare undergraduate courses), “Ambientação, currículo, ensino superior” (Environmentalization, curriculum, higher education), “Ambientação e currículo na graduação” (Environmentalization and curriculum in graduation), “Ambientação e graduação” (Environmentalization and graduation). This allowed us to identify what has been researched regarding curricular environmentalization in Higher Education in Brazil. Stumpf (2008) highlights that the elaboration of keywords or of a list of specific terms helps ensure a closer look at the topic studied, in order to save time and better define the geographical area to be studied.

This research yielded a result of 1,260 titles and abstracts, classified in six categories. Of the 1260 papers selected at the beginning, 309 were excluded due to repetition, and another 889 were excluded as they deviated from the topic, totaling 1,198 papers excluded. Therefore, a total of 62 papers related to curricular environmentalization in higher education resulted from our search, of which only eight discuss curricular environmentalization in healthcare courses, which shall be addressed with a more in-depth view in the present study.

Data of the documents found were treated through qualitative text analysis, a procedure that helps to have a deeper study of the discourse processes of the research by reading textual materials, aiming to "describe and interpret them in order to reach a more elaborate understanding of the phenomena and of the discourses inside which they have been inserted" (MORAES, 2007, p. 89).

3 HEI and the Environmental Crisis

The lack of understanding about the inter-dependence in the relationship between humankind and nature and the fact that it is a determining factor in aggravating the environmental crisis became quite evident (BARBON; NEUENFELDT, 2019). Leff (2003) states that the environmental crisis, which many thought would be temporary, has become a crisis of civilization.

According to Soffiati (2011), the environmental crisis is an anthropogenic crisis, derived from human activities that result from the capitalist or socialist way of life, with their unlimited exploitation of natural resources. The author emphasizes that there already have been planetary crises on Earth that were not anthropogenic and there have been non-planetary anthropogenic crises in the history of humanity, but this is the first time in the 4,500,000

years of existence of our planet that there is an environmental crisis derived from activities performed by humanity at a global level.

Passeti (2003) highlights that the constant power struggle between classes represented by disciplinary societies, as well as societies of control and sovereignty shift our attention and actions towards political, partisan, economic, and social interests, in order to ensure their structural legacy of power. Thus, historical and political determinism, represented by power structures of disciplinary societies, and of societies of control and sovereignty takes precedence over social relationships and builds around it a false impression that it is at the service of humanity in favor of caring for the environment. These control structures are disguised as good ideas and projects that aim to provide integral care for the community and the planet (PASSETTI, 2003).

The distancing between humankind and nature is partly a result of a traditional and conservative education focused on memorization and reproduction of foreign knowledges, coined by Paulo Freire (2002) as “banking model of education”. A trend influenced by the capitalist society has emerged, that anything can be transformed into a merchandise, including education, which is commodified.

In an opposite movement to the proposal of a commodified education, which distances humankind from nature, many developments in the Brazilian scenario of environmental education have emerged from debates deriving from the Conference of the United Nations for the Environment and Sustainable Development (CNUMAD), held in Rio de Janeiro, called Eco-92 or Rio-92. With Rio-92, the country took a step forward by recognizing the importance of sustainability related to development processes, which requires the inclusion of environmental education in several settings: social, political, economic, and educational. Before and after Rio 92, several important movements happened aiming at the elaboration of premises for environmental education. Below, we show a brief description of these milestones (CHART 1).

Chart 1. References of environmental education in Brazil

YEAR	PROGRAM
1981	Law number 6.938, of August 31, 1981 - Provides for the National Environmental Policy, its objectives and formulations mechanisms, and applications, and makes other provisions.
1984	Creation of the Programa Nacional de Educação Ambiental (National Program of Environmental Education - Pronea).
1988	Inclusion of EE as a right of everyone and a duty of the Government in the chapter about environment in the Federal Constitution.
1988	Federal Constitution – Article 225 and items.
1992	Creation of the Environmental Education Centers by the Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (Brazilian Institute of Environment and Renewable Natural Resources - IBAMA), and the Environmental Education Centers by the Ministry of Education (MEC).
1994	Creation of the Programa Nacional de Educação Ambiental (National Program of Environmental Education - Pronea) by MEC and the Ministry of the Environment (MMA).
1995	The temporary Technical Chamber of Environmental Education was created at the National Council for the Environment (CONAMA), which was determining for strengthening Environmental Education.

1997	Elaboration of the curricular Parameters defended by the Department of Elementary Education of MEC, in which "Environment" is included as one of the transversal topics.
1999	Law number 9795 of Tuesday, April 27, 1999 - Provides for environmental education, establishes the National Policy of Environmental Education and makes other provisions - see concept of environmental education.
2001	Implementation of the Program Parameters in Action: environment at school, via MEC.
2002	Regulation of the National EE Policy (Law number 9.795) and by Decree number 4.281.
2003	Creation of the Managing Body of National EE Policy, re-uniting MEC and MMA.
2012	Resolution number 2, of Friday, June 15, 2012 - Establishes the National Curricular Guidelines for Environmental Education.

Source: the authors, based on Carvalho (2012).

The Global Forum was also taking place in Rio de Janeiro, at the same time as Rio+20, and it gathered environmental, social, community, and religious entities, as well as entities for the defense of individual and collective rights, defense of improving quality of life, universities, unions, among other actors, which discussed sustainability in an all-encompassing manner: environmental, social, economic, political, and ethical. The primary focus of the Forum was to question economic growth and its degrading impact on social and environmental aspects, proposing a new form of living in the planet, in solidarity, against commodification of nature, and in defense of common goods (GUIA RIO+20, 2012).

The Global Forum provided civil society with a wide debate on sustainable development; it also encouraged the states to elaborate policies to protect natural resources and human life. During the event, several plans of action, called "Treaties" of the civil society, were approved and divided into four axes: a) cooperation; b) economic; c) environment; and d) social movements (VIEZZER, 2017).

For its creators, the Treaty on Environmental Education for Sustainable Societies and Global Responsibilities is not just a document; it is a movement of essential importance as it helps define the role and space of environmental education, especially by contributing with the elaboration of social and human responsibility documents, e.g. the Earth Charter (VIEZZER, 2017).

Agenda 2030 currently works as a guideline in the search for more sustainable paths. Its objective 4 proposes to ensure inclusive, equitable, and quality education and foster opportunities for everybody to learn throughout life. Target 4.7 establishes that by 2030, all students shall be ensured the required skills and knowledges to promote sustainable development, including the search for sustainable life styles through education, with respect to human rights, to equality of genders, to fostering a culture of peace and non-violence, of global citizenship, and valuing cultural diversity (NAÇÕES UNIDAS NO BRASIL, *on-line*)

The present study lies in the last item, target 4.7, as its purpose is to contribute with the education field, through reflection, especially upon the scholarly curricula of Healthcare courses. The concern with sustainable development and with actions of environmental management have been gaining more and more space at higher education institutions. According to some researchers, such as Figueiredo *et al.* (2017, p. 43):

Universities represent social spaces of the utmost relevance for the reflection, education, and dissemination of new concepts of development and sustainability, taking part in the construction of another culture, which meets the yearning for more just, solidary, and environmentally sustainable societies.

Chauí (2003), on the other hand, emphasizes that a sustainable university consolidates adequate environmental practices and fosters researches and extension activities that add value and critical behavior to environmental issues in the daily lives of students. In order to do that, planning practices and policies that broaden the ecological perspective in the institution is required, as well as increasing auxiliary services that enable to experience sustainability on a daily basis, not only occasionally.

According to Cavalcanti (2009), the fact that teaching institutions need to work environmental issues in their curricula is a complex challenge, particularly regarding the qualification of critical, ethical professionals, with social, human, environmental, and political awareness. For that, the higher education institutions (HEI) need to work in partnership with civil society and the governments.

The Ministry of Education (MEC), agency responsible for the regulation, inspection, and assessment of higher education institutions, provides for the development of activities in the teaching, research, and extension universities, as well as management, intended for social responsibility activities, which includes the environmental scope.

As for the incorporation of environmental issues in health policies, they are considered to be emerging actions, particularly in the education of healthcare professionals who integrate the environmental setting. The educational process should focus on the learning process of students towards knowledges and skills based on sustainable practices, aiming to protect life and the ecosystems, respecting the natural *habitat* of the population.

Cities have been growing with no planning nor physical and sanitation structure, which brings countless problems to the environment, particularly in unhealthy areas, of social exclusion and vulnerability, leading to new diseases and aggravations derived from the change in the population's habits and the adoption of new life styles, diet, and housing. These changes result not only from the widespread valuing of consumerism, but also from inadequate disposal of waste, namely health waste, which contaminates soil, water, air, and thus, affects the health of the population. In face of this dangerous relationship, many educators and health professionals have been seeking knowledges that support a conscientious ecological action in the health-disease process of the work environment.

The National Council of Education - CNE approved the CNE/CP Report nº 8, of March 6, 2012, which establishes the National Guidelines for Education in Human Rights, including environmental rights in the group of those that are internationally recognized, and defines that education for citizenship encompasses the political dimension of caring for the local, regional, and global environments (BRASIL, 2012a).

Resolution N° 2, of June 15, 2012, which establishes the National Curricular Guidelines for Environmental Education (DCNEA), recognizes the transforming and emancipatory role of Environmental Education and considers it a duty of the teaching systems and their Basic Education and Higher Education institutions. The DCNEAs are guided by the provisions in the Federal Constitution, and in Law n° 9.795/1999, which addresses environmental education and establishes the National Policy of Environmental Education - PNEA. PNEA defines the need for training subjects using critical reflection, resulting from the inclusion of Environmental Education in pedagogical projects of teaching institutions, with Environmental Education being an integral part of the curriculum (BRASIL, 2012a). Environmental education is a premise for sustainable development and should be tackled at the HEIs throughout the education of undergraduate students, with an interdisciplinary perspective.

If inter-, multi-, and transdisciplinarity is devised, a new epistemological milestone appears, which indicates new ways of thinking about how to organize knowledge, considering the challenge of the fragmentation of academic subjects. Thus, according to Carvalho (2012), science has provided spaces for questioning the different interests and social forces that are organized around environmental issues. Leff (2008) advocates for environmental rationality to confront the exaggerated instrumental rationality of the industrial society. Environmental rationality, according to the author, implies the formation of a new knowledge, based on the interdisciplinary integration of theoretical and practical knowledges, with the purpose of reaching a better understanding of the relationships between society-nature. He adds that the excluded, oppressed, degraded environment cannot be filled in with the greening of economy, but with changing its paradigms of knowledge to build a new social rationality.

Morin (2007) explains that it is necessary that rationality and scientificity are redefined and complexified. To attain democratization of knowledge, it is necessary to invest in reformulating the thought, which stops being programmatic and starts to work in a paradigmatic manner. It is necessary to encourage the development of aptitudes of the mind, in order to rescue the brain, mental, and cultural characteristics of human knowledge, to be able to recognize mistakes as a path to a new learning, according to Morin.

Human nature is controlled by senses, perceptions, feelings that interact, at the same time, with the physical, biological, psychic, cultural, social, and historical state. "To know the human is, first and foremost, to place humans inside the universe, not separate them from it" (p. 47). Therefore, the education of the future shall organize teaching focused on the human condition, as well as instigate essential topics on politics, education, economy, culture, citizenship, encouraging dialog, which helps understand ideas, arguments, and ideologies, and allows reaching a holistic view of the world (MORIN, 2000).

There is an urgent need for society to reflect upon how to strive and find solutions to environmental problems, especially when there are events such as the Coronavirus pandemic, which proves there is global inter-dependence among all living beings. In this scenario, it is relevant to consider that education is the key to sustainable development and that the HEIs should remodel education in order to encourage attitudes and behaviors that hold a culture of

sustainability, as defended by Mayor (1998). Universities play an essential role in preparing new generations to obtain a more sustainable future, and curricular environmentalization is vital in this context. In this same regard, the Talloires Declaration, although it does not address environmental education specifically, proposes actions that encourage universities become committed to education, research, the elaboration of policies and exchanges focused on topics related to the environment, with the purpose of achieving a sustainable future (CONFERÊNCIA DAS NAÇÕES UNIDAS SOBRE DESENVOLVIMENTO SUSTENTÁVEL).

4 Integrative Analysis of Curricular Environmentalization in Healthcare Courses

Here we introduce the eight studies identified by the integrative analysis as the ones specifically addressing curricular environmentalization in healthcare courses. Overall, they indicate that professional qualification in the health area has been undergoing constant changes, which along with social crises, has required new directions in the education of these professionals, so that they master technical-scientific knowledges that shall subsidize their practices without losing track of ethical-legal precepts of the professions discussed.

Nascimento and Moura (2017) investigated adventure race as an extension activity in the graduation course of Physical Education at the Universidade Federal do Vale do São Francisco (Federal University of the San Francisco Valley - Univasf), situated in the city of Petrolina-PE. The authors consider that the activity provides different emotions, which also helps to bring students closer to elements of nature, since activities are performed most of the time in regions of the Atlantic Forest.

As a result, according to the authors, these activities have allowed direct and long contact with nature, which results in a teaching and learning process of great value, as the students had the opportunity to combine theoretical and practical knowledge in real time. Additionally, this allowed experiences to be exchanged with the local community and a reflection upon contents of several academic subjects that were developed in the classroom in the course of Physical Education. Among those contents were historical and evolutionary aspects of global and national environmental policies; environmental management for non-managers; Environmental Education and environmental monitoring aspects (NASCIMENTO; MOURA, 2017).

Rodrigues (2015) also investigated the Physical Education course at Federal Universities of Brazil, in order to diagnose how advanced are environmental practices and programs in higher education. The study contemplated the analysis of the topic in the teaching plans of the course subjects (objectives, summary, contents, and teaching methodologies). According to the author, it is noticeable that some communities connected to the educational sectors already acknowledge a certain importance of environmental education and of the need to insert it in the curricula, especially to awaken and encourage teachers to become agents of change in search for a sustainable society. The author highlights that

teacher training should be priority as it is one of the greatest bottlenecks for institutionalizing the environmental scope in higher education. He considers that the topic should be addressed in a transversal manner, integrated to the local reality and to professional profile. However, he observes that curricular environmentalization is something recent in the academic setting, still comprised of particular and one-off actions even though it is necessary in tackling socio-environmental problems.

As a result, the author showed that subjects that exploit sports and recreational activities in nature have low synergy between Physical Education and environmental issues. On the other hand, the subject of Ecology does not contemplate the idea of interdisciplinarity, although it associates its contents to the dialog between environmental issues and the particulars of the course. According to the author, the lack of an epistemological identity to include environmental issues results in social practices that are only occasional (RODRIGUES, 2015).

In their study, Rink and Neto (2013) corroborated the argument defended by Rodrigues (2015) that universities should take on the social commitment to help face the environmental and cultural crisis, investing in an early and continued education of teachers as a key element. HEIs should foster reflections, discussions, and forge closer ties between research spaces and the other sectors of society, encouraging actions of environmental change. In order to do that, according to Rink and Neto, HEIs must rethink their teaching and learning processes, considering the multiple scenarios in which they act locally, globally, and temporally.

Rink and Neto (2013) investigated the post-graduation programs offered between 1987 and 2009 by Brazilian HEIs, in order to analyze how the topics related to curricular environmentalization were being tackled in teacher training. The search resulted in 124 dissertations and theses identified about the topic.

The Southeastern region (50%) produced the highest number of studies on curricular environmentalization and teacher training, and the topic started gaining visibility in 2000. The Southern region accounted for 31.5% of the studies, the Northern region contributed with 4.8%, the Northeastern region, with 4.8%, and the Mid-Western region had 8.9% of the studies. Regarding the geographical scope of the 124 studies, 19 states were found, including the Federal District (RINK; NETO, 2013).

With regards to the association between research and education areas, the inclusion of environmental education in teacher training predominated in the licentiate courses of Biology/Biological Sciences (41.4%), followed by the Pedagogy course (24.13%). In bachelor courses such as Medicine, Nursing, and Veterinarian Medicine, only four papers published were found. The research showed that licentiate courses and the Southeastern and Southern region were the ones that gave most prominence to environmental education in teacher training. On the other hand, in courses of the Healthcare area, environmental education had no significance in teacher training (RINK; NETO, 2013).

Another study, by Rink (2014), investigated concepts and practices of curricular environmentalization and dissertations and theses of environmental education, focused on the qualification of teachers and environmental educators. Out of the 2,151 theses and dissertations considered, 85 works were selected to comprise the document *corpus* of the research.

The author emphasized that public institutions accounted for 68.2% of the production (47% at federal institutions and the others at state institutions); private institutions accounted for 31.8%; and 1.2% corresponds to municipal institutions. Regarding academic degree, master's dissertation predominate with 70.5%, while PhD theses represented 16.5% of the production investigated; the remaining production was produced in professional master's programs (13%). The research also showed that the works presented in dissertations and theses are theoretical, argumentative, and reflective. They discuss the philosophic, political, and epistemological fundamentals for addressing curricular environmentalization in Higher Education, most of them focusing on curricular policies (RINK, 2014).

Guerra *et al.* (2014) investigated the environmental topic in curricular documents of the graduation courses at Universidade do Vale do Itajaí (University of Itajai River Valley - Univali). According to these authors, socio-environmental and sustainability issues affect directly or indirectly the quality of life of professionals and of the setting where they are inserted. Therefore, the university setting is an appropriate space for reflection, for building and transposing knowledges, procedures, and innovation, in the search for better life styles and for responsible consumption, thus helping tackle environmental problems and risks (GUERRA *et al.*, 2014).

The methodological procedure used by the researchers was document analysis of teaching plans, gathering 1037 documents from 27 graduation courses at the campuses of Itajaí and Balneário Camboriú. As a criterion for proving curricular environmentalization, the 10 (ten) indicators of the Curricular Environmentalization Network of Higher Education (ACES Network) were used, which were also the driving elements in the elaboration of a questionnaire with 19 questions (open and closed), aiming to identify how the professor contemplates the environmentalization characteristics mentioned by the ACES network in their academic subjects. As a result, the prevalence of three indicators of the ACES Network were identified in 51 subjects from 18 courses. In the courses of Health Sciences, only nine academic subjects were included in the three indicators identified (GUERRA *et al.*, 2014).

Peres *et al.* (2015), studying environmental education for nurse professors, analyzed the perception around the topic as well as its relationship with nurse formation. The research contemplated nurse-professors of five graduation courses in Nursing at federal HEI's in Rio Grande do Sul. Data were produced through an analysis of pedagogical projects and semi-structured interviews with 17 nurses. As a result, a wide array of perceptions on environmental education became evident, from a restricting perception of a merely biological concept, to a perception focused on the ecological scope, with predominance of the preservationist perspective. Other perceptions are based on naturalistic perspectives, directed toward physical aspects of the environment, such as preservation of water, soil, plants,

animals, etc. The participants indicated the need to base environmental education on other contexts, such as family, community, and population in general, offering an appropriation of knowledges through reflections upon environmental issues related to health (PERES *et al.*, 2015).

The research identified that to include the environmental topic in the education of nurses is still something quite rudimentary, and it requires further discussions on the theme, although it is not quite valued by nurses as their training over-values techniques, in a biologist and interventionist paradigm, which is a reflection of the traditional teaching method, guided by a reductionist and conservative view of knowledge. It is also understood that there is resistance by some professors in adopting new teaching methodologies, which hampers an integrative view of their pedagogical practice. All this emphasizes how challenging it is to implement curricular environmentalization in graduation courses.

The authors noticed the need for raising awareness in nurses for them to act strategically, considering that the relationship between health and environmental sustainability are directly linked to the environment and to the health-disease process. Because of that, they advocate the need for articulating knowledges in search for the qualification of a professional nurse who is environmentally aware, adding new topics, values, criticism, and reflection. The authors understand that environmental education in professional qualification maximizes the commitment with the environment, as well as the dialog and participation of the professional as citizen and user of the resources offered by nature. Continued education is placed as the driving force to reach environmental knowledge, to allow new values and culture to be incorporated (PERES *et al.*, 2015).

In another paper, Peres *et al.* (2016) address the (in)visibilities and (dis)continuities of environmental issues in professional nurse training, and they discuss the role played by education regarding this topic. The study involved nurse professors, whose testimonies emphasize that there is no interface between health and environment. According to the authors, this argument goes against the prerogative of the precursor of Modern Nursing, Florence Nightingale, whose understanding of health encompassed the importance of environmental variables, seeing that they could affect health conditions, and she thus believed that including the environmental issue was essential in matters of health (PERES *et al.*, 2016).

Peres *et al.* (2016, p. 28) highlight that the "[...] perception about the health and environment interface based on social relationships, based on ethics, on valuing the environment, and interpersonal behaviors is key to understand the phenomenon health, which cannot be reduced to simply an analysis of disease". The concern with the other and with the environment must override individualism, profit, this obsession with economic growth, this lack of accountability towards the environment in the sense that we must reflect upon the causes that lead society to omission and to the extreme predatory process with nature.

Field research showed that for the informants, this topic is intrinsic to the practice of nursing, present in the assistance to the patient, in socio-economic data collection, and in nursing management. However, the authors noticed a wide distancing between what should

be done and what actually is done, unveiling that this rapprochement between health and the environment is an individual practice of a few professionals, and not a collective reality.

Therefore, they consider it essential to include the contents related to the health-environment interface in professional training, as provided for in Law No. 9795/99, which establishes the National Policy for Environmental Education (PNEA), to encourage professionals to reflect upon the problems of contemporaneity, in search for a critical and responsible action in socio-environmental issues (PERES *et al*, 2016).

The need for having an in-depth approach to these issues is emphasized in the paper, both in the scholarly setting and the work environment, so that disarticulation and fragmentation of contemporary knowledge are overcome, to reach a critical, complex view that integrates health problems and environmental care, to perceive the needs of the populations in their different cultures.

The research showed that there is little engagement of nursing professionals with actions that involve the health and environment axes, inasmuch as nurses have difficulty in making considerations about socio-environmental issues related to their workplace, although the nursing practice demands actions and responsibilities that encompass similar knowledges, such as the correct disposal of infecting and non-infecting waste, as well as epidemiological and sanitary issues, which affect the growth of the health-disease process in the population dwelling in vulnerability areas. A merely technical training hinders a macro-view of the health-disease process and of its driving factors, guiding the professionals to the specifics of daily life (PERES *et al*, 2016).

The difficulties shown by the nursing professionals are a reflection of how the training process takes place. The great challenge is to educate inside and for the planetary era, which involves criticizing the simplification and fragmentation and recognizing that in a scenario of uncertainties, complex issues assume a broad approach, which includes natural, social, ethical, and political aspects (PERES *et al.*, 2016).

Even without clear evidence of the environmental issues in the National Curricular Guidelines in the Nursing course, the HEI must recognize the importance of inserting them in the curricula of their courses, as they understand that the student, the future healthcare professional, needs to take on his or her role as an agent of transformation with the health problems, especially in areas of great social vulnerability. For that, it is necessary to interact with other knowledge areas, to understand social, political, environmental, and economic contexts, especially local and regional realities and their determining factors, with the purpose of proposing health prevention, promotion, protection, and rehabilitation actions. These initiatives have led the majority of HEIs to offer academic subjects such as "environment and health" and/or "environmental education" or "health-environment", in the syllabuses of their respective courses (PERES *et al.*, 2016).

In another study, Sena *et al.* (2010) mention that health problems are becoming increasingly more complex and the interventions in search for solutions have been based on a

health concept that prioritizes the biological aspect, with disregard to the complexity of humankind and of the context in which they live and work. Therefore, the environmental issue must be devised as a factor of great importance to human development, particularly as a path towards sustainability, based on the critical reflection of the daily practice regarding nature and the relationship humans-environment.

Sena *et al.* (2010) emphasize the need to include socio-environmental knowledges and perceptions in graduation courses, especially in nursing training, considering the close relationship between the environmental knowledge and how the health-disease process takes place.

According to the authors, professionals should understand that environmental degradation is directly linked to the deterioration of social conditions where new epidemics are produced and spread. To reverse this scenario, it is important to place the human being at the center of concerns related to sustainable development. Hence, teaching institutions must take on their social role and propose actions that integrate the different aspects of health problems, considering the complexity of human beings and the context where they live and work. Therefore, rethinking professional education focused on diversity and complexity of the contemporary world implies facing the gaps that separate teaching, practice, and caring for the work setting (SENA *et al.*, 2010).

5 Discussion

The integrative analysis has revealed that curricular environmentalization in healthcare courses, although considered imperative for these professionals, is not effective in furthering these intersections, due to the nature of the relationship between the training area and the environment.

Studies indicate that direct contact with nature enriches the teaching and learning process, as it allows combining theoretical and practical aspects, which is also done through the exchange of experiences with the local community, further contributing to strengthen the contents studied in the classroom (NASCIMENTO; MOURA, 2017). As it is a place intended for reflection and the construction of knowledges, the academic setting is favorable for the dialog about socio-environmental issues, leading the academic community to instigate, understand, foster, confront, disagree with policies and practices that regulate this topic, especially because it is intrinsically linked with the life quality of professionals and population. However, their studies highlighted that the courses linked to Health Science are still wavering when addressing this topic (GUERRA *et al.*, 2014). According to Rink (2013), Rodrigues (2015), and Peres *et al.* (2016), curricular environmentalization refers to a social commitment that must be assumed by the universities to face the cultural and environmental crisis and understand its complexity, and according to Rodrigues, this goes through teacher training.

Curricular environmentalization has been happening in Higher Education, even though it is superficial, recent, and occasional, and yet, it still is necessary to invest in transversality, in the integration with social realities, associating environmental issues with specific educational contents, under an interdisciplinary perspective, and this requires that the teaching and learning processes are reviewed (GUERRA *et al.*, 2014; RINK, 2013; RODRIGUES, 2015). As opposed to these authors, Rink and Neto (2013) suggest that the inclusion of environmental education in teacher training still predominates in licentiate and Pedagogy courses, with little significance in courses of the Healthcare area. Additionally, academic studies that indicate pragmatic paths to face this scenario are scarce, as indicated by Rink (2014), even though we are facing a scenario in which health problems have become increasingly complex, as stated by Sena *et al.*, (2010). The COVID-19 pandemic has left no room for doubt. Even so, the concept of health is usually limited in its dimensions, not tackled in a complex and interdisciplinary manner, which would emphasize its relationship with environmental changes. The authors emphasize the need to include knowledges that relate the health-disease process with the environment in nurse training, since environmental degradation affects social conditions, which becomes quite evident in epidemics. It is the responsibility of teaching institutions to rethink professional training, tackling these gaps in education.

Despite this need indicated by the authors previously mentioned, Peres *et al.* (2015) and Peres *et al.* (2016), in their studies of integrative analysis focused on Nursing courses, identified the limited conceptions these faculty professors have regarding environmental issues: they have a preservationist ecological approach, which is naturalist and decontextualizes socio-cultural environments and health issues. In addition, the resistance by professor hampers curricular environmentalization, which above all requires a change in paradigm, towards including inter-relations in the environment, as well as social relations in healthcare processes. By doing the latter, professionals of the Healthcare area might take on a complex, systemic, and interdisciplinary perspective, according to which the relationship between diseases and the social, political, economic, and environmental dimensions - among others - are undeniable. The perception of the relationship between health and environment is still restricted to few professionals, according to the study, which urges us to dive deeper into these issues, both in the scholarly setting and in the work place, as they derive from an education that requires a broader approach.

The study results shown in the integrative analysis thus indicate the lack of a more in-depth inclusion of environmental topics in the Healthcare course curricula contemplated in the papers. The areas researched were Nursing, Pharmacy, and Dentistry, which did not have investigations related to curricular environmentalization in the databases search.

Integrative analysis is related to what established in the course curricular guidelines, and these guidelines indicate the lack of a clear identification of what is expected in the environmental education of a professional, which goes far beyond the sustainable treatment of waste, when it is mentioned at all.

National Curricular Guidelines of the Nursing Course establish that a professional must be capable of knowing and interfering with health-disease situations in the regions where they operate; therefore, it considers their relationship with the life settings of the patients, which include family, community, and a perspective of public healthcare. The relationships with environmental topics are not a requirement in the curricula. However, when biopsychosocial dimensions and regional specifics are acknowledged, it becomes evident that environmental problems must be contemplated.

The National Curricular Guidelines of Dentistry courses value the interaction between patients and their realities, understanding the health-disease process of citizens, family, and community, integrated to epidemiological and professional reality. Sustainability, in turn, is perceived in a three dimensional perspective: environmental, financial, and social, which is directly linked to attention to production, treatment and disposal of solid waste derived from their practice, which causes damages to the environment.

On the other hand, the National Curricular Guidelines of Pharmacy courses establish a holistic understanding of the health-disease process, which includes the value of environmental factors. By valuing pluralism and cultural diversity, these aspects become related to the natural setting, as it considers the context of citizens as a boosting factor of quality of life. The focus is preventive healthcare.

While the environmental problems assume an increasingly more evident and relevant proportion, the Healthcare course curricula continue to push the debates to the fringes, despite the intrinsic relationship between health and environment. Overlooking this articulation is a result of what Guatarri coins as inability of social forces.

Guatarri (2001) considers that we live in the middle of a social tension, stimulated by an integrated global capitalism that, on the one hand, favors the continuous development of new technical-scientific means with new industrial powers, and on the other, the inability of social forces to tackle the damages caused by the industry to the environment.

Society must let go of submission and not allow to be silenced by power manifestations any longer. For that, we must invest in the production of knowledges that enable us to understand the daily world and the relationships that unfold inside. We need to establish some boundaries so that there is socio-cultural, environmental, political, economic pluralization. Nevertheless, Maturana and Varela (1995) recognize that human beings find it difficult to attain a social, harmonious, and steady development, which is due to the lack of knowledge about nature itself.

Therefore, investing in curricular integration is the most effective path to mitigate the fragmentation and disarticulation between scholarly knowledges and contemporary challenges in face of the environmental crisis. The predominance of capitalism in human development has created different disruptive and alienating processes, thus consolidating an education guided by the technical dimension and disregarding all other dimensions. However, with the aim to encourage critical knowledge to interpret social relationships, the universities

have been challenged to reorganize their curricula, through innovative pedagogical proposals based on curricular flexibilization and on inter-, trans-, and multidisciplinary movements (PETRAGLIA, 1993).

According to Apple (1994, p. 59), the curriculum is the link between knowledge and professional practice:

[...] It is always part of a selective tradition, resulting from the selection of someone, of the vision of one group as to what is legitimate knowledge. It is a product of tension, conflicts, and cultural, political, and economic concessions that organize and disorganize a community.

The curriculum does not only move through the field of narratives; it also comprises an arena for fighting and consolidating identities, which sometimes are subjugated and silenced, with the consequent violent process of cultural homogenization. This is due to the globalization of capital and the practical rhetoric of consumerism, based on the premise that it is necessary to acquire and possess everything possible, thus limiting, through power relations, those that are on the fringes of the process, classified as the unequal and excluded economically, socially, and culturally (COSTA *et al.*, 2005).

The need to implement all new curricular paradigms based on human education guided by social, political, economic, and environmental interventions is the great challenge faced by universities. According to Zabala (2002, p. 53), “[...] the curriculum needs to offer the means to analyze the global situation, creating an awareness of active commitment, enabling the instruments for intervention for social change.”

Under this perspective, we reiterate the importance of innovative pedagogical proposals, committed to the development of solidarity and citizenship, focused on actions whose essence lies on improving the quality of life and the environment. Therefore, it is imperative to reconnect knowledges, unraveling the disjointed thought, which has determined fragmented practices and rendered invisible the interactions and complexities of the planet's problems. Education arises as an indispensable ally to prepare future citizens to act in a responsible and conscientious manner, both physically and socially.

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