

Interdisciplinarity: an indispensable reference for the bioethics teaching-learning process

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Abstract

Taking the multidisciplinary training of researchers and students interested in Bioethics as a starting point, the theoretical and practical framework of interdisciplinarity has become an indispensable tool in the teaching-learning process. Through a retrospective study of frequency the curriculum profile of students enrolled in the *Stricto Sensu* Graduation Program of the Unesco Cathedra in Bioethics at the Universidade de Brasília (Brasília University) was analyzed. From 145 students enrolled between 2008 to 2015, 56.6% were from the Master's Degree course, 41.4 % from the Doctorate course and 2.1 % from the Post-Doctorate course. The students were from 15 different states and the Distrito Federal in Brazil, as well as Argentina, Colombia, Mozambique and Uruguay, and had graduated in 29 different subjects, the most common of which were Physics (14%); Law and Biology (12% each); Dentistry (10%); Psychology and Nursing (8% each); and Physiotherapy and Philosophy (7% each). The areas of prevalent knowledge were Health Sciences (58.3%); Humanities and Social Sciences (33.5%); and Biological Sciences (4.4%). Epistemology of Bioethics is the inherent interdisciplinary framework and essential to the teaching-learning process of these students.

Keywords: Bioethics. Education. Teaching. Learning.

Resumo

Interdisciplinaridade: referencial indispensável ao processo de ensino-aprendizagem da bioética

A partir da formação multiprofissional dos pesquisadores e estudantes interessados em bioética, o referencial teórico-prático da interdisciplinaridade tornou-se ferramenta indispensável no processo de ensino-aprendizagem. Mediante estudo retrospectivo de frequência foi pesquisado o perfil curricular dos alunos ingressados no programa de pós-graduação *stricto sensu* da Cátedra Unesco de Bioética da Universidade de Brasília. Dos 145 estudantes matriculados no período entre 2008 e 2015, 57% ingressaram no mestrado; 41%, no doutorado e 2%, no pós-doutorado, provenientes de 15 estados e do Distrito Federal, de Argentina, Colômbia, Moçambique e Uruguai. Os alunos provêm de 29 graduações, sendo as principais: medicina (14%); direito e biologia (12% cada); odontologia (10%); psicologia e enfermagem (8% cada); fisioterapia e filosofia (7% cada). As áreas de conhecimento prevalentes foram ciências da saúde (58%); ciências humanas e sociais (34%) e ciências biológicas (4%). A epistemologia da bioética encontra na interdisciplinaridade o referencial inerente e fundamental para seu processo de ensino-aprendizagem.

Palavras-chave: Bioética. Educação. Ensino. Aprendizagem.

Resumen

Interdisciplinarietà: referencia indispensable del proceso de enseñanza-aprendizaje de la bioética

A partir de la formación multiprofesional de los investigadores y estudiantes interesados en Bioética, la referencia teórico-práctica de la interdisciplinarietà se tornò herramienta indispensable en el proceso de enseñanza-aprendizaje. Por medio de un estudio retrospectivo de frecuencia, se estudiò el perfil curricular de los alumnos que ingresaron en el Programa de Posgrado *Stricto Sensu* de la Cátedra Unesco de Bioética de la Universidad de Brasília. De los 145 estudiantes matriculados en el periodo 2008-2015, el 56,6% ingresò en la maestría, el 41,4% en el doctorado y el 2,1% en el posdoctorado, provenientes de 15 estados y del Distrito Federal, y de Argentina, Colombia, Mozambique y Uruguay. Los alumnos provenían de 29 carreras de grado, siendo las principales: Medicina (14%); Derecho y Biología (12% cada una); Odontología (10%); Psicología y Enfermería (8% cada una); Fisioterapia y Filosofía (7% cada una). Las áreas de conocimiento principales fueron Ciencias de la Salud (58,3%); Ciencias Humanas y Sociales (33,5%); y Ciencias Biológicas (4,4%). La epistemología de la Bioética encuentra en la interdisciplinarietà una referencia inherente y fundamental para su proceso de enseñanza-aprendizaje.

Palabras clave: Bioética. Educación. Enseñanza. Aprendizaje.

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In the last decades, professionals from different areas have been living in an environment permeated by increasingly complex situations, especially when related to the field of bioethics. The contemporary era is technological, based on specializations and super-specializations, on the growth of the so-called biotechnologies and on issues related to the capital and the human, animal and planetary quality of life, among other aspects. In this sense, it is necessary to discuss responsibly the ethical limits of all these advances and their consequences¹.

Bioethics is characterized for being a multi, inter and transdisciplinary field of knowledge², related to ethical problems that develop in parallel; on the one hand, to the habits and transformations verified in morals existing in varied cultures of different places and, on the other hand, to the scientific and technological advances of the contemporary world.

The most widespread concept of multidisciplinary concerns the study of objects by several disciplines simultaneously, meaning in practice the interpretation of the same object of study from its particular mode of action in each discipline (for example, abortion from the perspective of medicine, law, philosophy, theology, among others).

Interdisciplinarity, in turn, refers to the transfer of methods from one discipline to another, for example, the different disciplines mentioned above analyzing the problem in an integrated manner, dialoguing among themselves. Transdisciplinarity, however, refers to what lies between the disciplines, that is, between the limits of their borders, having as one of its imperatives the unity of knowledge; this interpretation goes beyond the disciplines adopted here as a reference, providing a new, more organic and integrated look to the question under analysis².

For this study, interdisciplinarity will be used as reference, considering the empirical material presented in the topic on the methodology applied. Among other aspects related to the topic, it is questioned how interdisciplinary relationships can be facilitated so that specialists from different areas can really act as a team. The ethical dialogue provided by bioethics training, based on complexity and interdisciplinarity, places greater emphasis on deliberation, articulation, negotiation, exploration and the generation of new ethical looks and perspectives³.

Bioethics training makes it possible to standardize concepts and reflections for the dialogue between professionals from different areas of expertise. In addition, it establishes the necessary reference for interaction and collaboration among these different

areas, sharing a language, approaches, materials and strategies from an ethical point of view, and applying theoretical and practical references related to complexity and interdisciplinarity. Professional ethics education usually seeks to promote ethics among students, but also to create and maintain the best and fairest forms of professional action. Molded by historical and cultural contingency, the subjectivity of the student is reconfigured within the scope of bioethics by the assimilation of specialized and technical knowledge and by the systematic study of values and beliefs³.

One of the most significant changes in recent years has been the expansion and diversification of professionals working together, be it in health teams or other teams, in constant contact and exchange. Large medical centers, hospitals, clinics and public health and private medicine programs, for example, are run by specialized professionals who need to interact with each other, this in a certain way generates the exchange that influences their actions.

Seeking empirical elements, the objective of this study - based on the professional profile of the students who joined the *Stricto Sensu* Graduate Program of the Unesco Chair of Bioethics at the University of Brasilia - is to discuss the use of the interdisciplinary approach as one of the foundations of the teaching-learning process in a given educational reality.

Background

In the bioethics courses of undergraduate and graduate programs there is a growing need to prepare students for the ethical challenges they will face during their training and future professional activities⁴⁻⁹. At the University of Toronto, Canada, there is the Joint Centre for Bioethics (JCB), a network of over 180 professionals with interdisciplinary training acting in university support. Among other objectives, this center shows great interest in maintaining and encouraging graduate students to remain involved in this integrated teaching-learning proposal, offering prizes, scholarships and residency courses, among other activities, and encouraging their participation in ethics committees, which must have interdisciplinary composition¹⁰.

The importance and responsibility of graduate bioethics courses were reported in a study conducted in Pakistan, which evaluated 50 alumni five years after course creation and demonstrated that nearly half of them were involved in ethics committees. Of these, 100% believe that the course

has increased their knowledge and improved their practice, 94% disseminate this knowledge in committees, seminars and conferences, and 90% believe that their professional behavior changed after the course, also improving the quality of their work performance¹¹.

The Romanell report¹², in turn, describes present day practices in ethics education, offering guidance in several areas: educational goals and objectives, teaching methods, Assessment strategies and other challenges and opportunities (including the structure of courses and faculty development). The aim of the report was to help medical ethics educators in fulfilling these expectations. After analysis in the United States, the report identified challenges to educators in the area, mainly in the consensus about objectives, pedagogical methods and the increased pressure for efficient short-term results. The study concluded that the content of medical ethics disciplines can be improved by focusing on professional training as a way to prepare for lifelong commitment to patient care, education and research¹².

The significant development of bioethics in Brazil took place late, only from the 1990s, with many challenges having been overcome and many still to be overcome¹³. In the process of maturation and growth of Brazilian bioethics, we must mention the importance of graduate courses as trainers of professionals in the area. In this sense, analyzing profiles and determining certain aspects that involve the theme is fundamental for a better understanding of this area of knowledge, making it possible to outline goals that stimulate its improvement. In these more than 20 years, great advances have been recorded. However, there is still a long way to go for graduate studies in bioethics to fulfill their actual role as an auxiliary agent in building a better and fairer world. In this context, interdisciplinarity, as a reference element of the different programs, becomes an objective to be achieved^{13,14}.

Complexity of thinking is characteristic of interdisciplinarity. Nowadays, scientists can no longer be allowed to settle in the comfort of unidisciplinarity, mistakenly safe and distant from the current multifaceted world, which needs balanced and democratic responses in accordance with new forms of scientific and social coexistence and collaboration between the various areas of science. Knowledge, which used to be simple and straightforward, is increasingly hypercomplex, composed of multiple integrated and dynamic

elements. All these characteristics that favor a new scientific action are found in interdisciplinarity¹⁵.

The University of Brasilia *Stricto Sensu* Graduate Program in Bioethics, anchored in the Unesco Chair of Bioethics of the institution and offered at the masters and doctoral levels - which includes the post-doctoral internship - was created in 2008 after ten consecutive years of rigorous experience developed in the lato sensu course (specialization) offered annually for groups of 30 students. The course proposal, as well as the most advanced development phase after that year - with the creation of masters, doctoral and postdoctoral studies - was always based epistemologically on the analysis of the ethical problems and conflicts of human life in a broad sense, having interdisciplinarity as a reference. The purpose of this research, therefore, is to study the subject of interdisciplinarity based empirically in the discussion of the multiprofessional training of the students of this program.

Methods

In order to develop the research, a retrospective study was carried out on the profile of students enrolled in the University of Brasilia (UnB) Graduate Program in Bioethics - master's, doctorate and postdoctoral studies - through eight annual public notices between 2008 and 2015. The study sought to identify, according to the multiprofessional training of students, information that would allow us to analyze interdisciplinarity as a referential tool in the teaching-learning process.

The following data were searched in the archives of the program secretariat and on the Lattes platform: student's age, gender, origin, vocational training and other lato or stricto sensu graduate courses. All students both enrolled and those who concluded the graduate courses in bioethics at UnB at the masters, doctoral and postdoctoral levels in that period were included.

Results

The *Stricto Sensu* Graduate Program in Bioethics at UnB has public health as its focus area and three research lines: 1) Foundations of bioethics and public health; 2) Emerging situations in bioethics and public health; and 3) Persistent situations in bioethics and public health. The program centers its actions and research in bioethics integrated to the problems and practices of public health - interpreted

in its entirety, that is, in a broader way -, deepening the analysis of the ethical conflicts in the biomedical, sociocultural and political dimensions.

The curricular proposal presented to the interdisciplinary area of the “Coordenação de Aperfeiçoamento de Pessoal de Nível Superior” of the Ministry of Education (the Coordination for Improvement of Higher Education Personnel, *Capes/MEC* in the Brazilian acronym), focuses on two main fields of activity: the biomedical field itself, associated with bioethics since its implementation; and the socio-political field, an epistemological novelty proposed by the UnB academic group since the introduction of the specialization course in 1998. With the homologation

of the Universal Declaration on Bioethics and Human Rights by the United Nations Educational, Scientific and Cultural Organization, in 2005, it gained scientific, social and political support, incorporating 15 principles that significantly expanded its scope.

The UnB program has 60 places for students and, during the development of the study, had 56 students enrolled. Between 2008 and 2015, 145 students were enrolled (Table 1). Of this total, 82 (57%) enrolled in the masters program, 60 students (41%) in the doctoral program and three (2%) in the post-doctoral program. Females prevailed with 101 students (70%), against 44 male students (30%), and this prevalence was maintained in the other years.

Table 1. Distribution of the students in the Bioethics Graduate Program of UnB by course and year

Course/Year	2008	2009	2010	2011	2012	2013	2014	2015	Total	%
Doctorate	8	7	5	9	7	7	9	8	60	41
Master's degree	13	13	13	8	8	7	9	11	82	57
Post-Doctorate				1		1		1	3	2
Total/Year	21	20	18	18	15	15	18	20	145	

It was observed that the preponderant age group was between 31 and 40 years old, represented by 42.1% of the students, followed by the age range between 41 and 50 years, with 30.3% of the students, as can be seen in Table 2. The students were mostly from Brazil, from 15 states of the federation, and the Federal District, which represents 79% of the participants, followed by the state of Goiás with 5%. About 4% of the students were foreigners from Argentina, Colombia, Mozambique and Uruguay.

Table 2. Distribution of the students in the Bioethics Graduate Program of UnB by age group

Age group	Number of students	%
21-30	13	9
31-40	61	42,1
41-50	44	30,3
51-60	25	17,2
Above 60	2	1,4
Total	145	

Table 3 presents the most frequent of the 29 professions of students in the sample: medicine, with 20 students (12%); law, 18 (11%); biology, 17 (11%); odontology, 15 (9%); psychology, 12 (8%); nursing, 11 (7%); Physiotherapy and Philosophy, with 10 students each (6% each).

Considering all the undergraduate and graduate courses (specializations, master's and doctor's) held

before the entry of the students in the Graduate Program in Bioethics at UnB, the prevalent areas of knowledge were health sciences (58%), human and social sciences (34%), and biological sciences (4%). Only two students were from the exact sciences (1%).

Table 3. Distribution of the students in the Bioethics Graduate Program of UnB by profession

Profession	Number of students	%
Medicine	20	14
Law	18	12
Biology	17	12
Odontology	15	10
Psychology	12	8
Nursing	11	8
Physiotherapy	10	7
Philosophy	10	7

The areas of knowledge and their respective frequencies are listed in Table 4. In the same table it can be seen that the total number of students was 206, instead of the 145 students who enrolled in the program during the period studied. The numbers differ because there are students with training in more than one area of knowledge, be it specialization, second undergraduate degree or second graduate degree. It was also found that 57 students (39%) graduated in a second area of knowledge, including four students (3%) who graduated in a third area.

Table 4. Distribution of the students in the Bioethics Graduate Program of UnB by area of knowledge

Area of knowledge*	Master's	Doctorate	Post-doctorate	Total	%
Arts and languages	2	1		3	2
Agricultural Sciences		1		1	1
Biological Sciences	7	2		9	4
Health Sciences	69	49	2	120	58
Exact Sciences	1	1		2	1
Human and Social Sciences	41	27	1	69	34
Other	1	1		2	1
Total	121	82	3	206	

* Areas of knowledge according to: http://www.unb.br/posgraduacao/stricto_sensu/editais.php.

Discussion

This study made it possible to better understand some characteristics of the students who entered the Graduate Program in Bioethics of the University of Brasilia between 2008 and 2015, highlighting the predominance of females (70%), with ages between 31 and 40 (42%), coming from Brasilia (79%), with education in the area of health sciences (58%), mostly from medical (12%), law (11%) and biology (11%) courses.

With a similar result, a study carried out in 2009 at the UnB Unesco Chair of Bioethics which analyzed a decade (1999 to 2008) of the development of the lato sensu graduate course in bioethics (specialization), also found the prevalence of female students (67%), with basic training in the areas of health sciences and human and social sciences¹⁶.

At the University of Brasilia, a doctoral thesis on the academic profile of teachers who teach subjects related to bioethics in 163 courses in the area of health sciences recognized by CAPES, pointed out that 60% of the teachers were male. With regard to teacher training, the majority had medical education (47%), followed by dentistry (20%) and nursing (10%)¹⁷.

Medical schools were represented by more students and teachers, and there was a prevalence of health sciences. The importance of bioethics for health professionals is well reported, considering that dialogue plays a central role in almost all aspects of medical practice^{18,19}.

A question to be discussed, and to some extent a surprising one, is the unusual and growing interest of students from the humanities and social sciences in the graduate course in bioethics at UnB: about 34%. Data from the study mentioned previously, regarding the profile of teachers in Brazil, indicate only 13%¹⁷.

What was observed in the study at UnB is that students coming from law, psychology and philosophy courses have shown special interest in bioethics. It is important to emphasize that the beginning of bioethics as a graduate discipline in the country arose in Porto Alegre, at the Pontifical Catholic University of Rio Grande do Sul ("Pontifícia Universidade Católica do Rio Grande do Sul" - PUCRS), in 1988, in the medical school¹⁴ – still the most representative in the samples mentioned herein, although gradually share relevance with other professions.

Figueiredo takes into account the fact that bioethics currently receives professionals from different fields of knowledge, not only from the medical field, denoting the multidisciplinary training. The author concludes that professionals more familiar with transdisciplinary methodologies are more suitable for this field, since they tend to have particularly good sense and sensitivity as attributes inherent to their professional performance¹⁷.

In this study on the profile of graduate students in bioethics at UnB, 29 academic origins were found, of which 39% of the students had training in different areas of knowledge. These professionals represent diverse roles in society, acting as consultants, managers, politicians, educators, jurists, researchers and clinicians, responsibilities that require certain skills and ethical basis of practical and social knowledge as well as literature knowledge about the health system, the right to health and medical terminology.

It is natural, therefore, that these realities require complex communication, decision-making and interpersonal skills. In view of the multifaceted aspects of these contexts, interdisciplinarity becomes not only relevant but necessary for the practice of bioethical practice, since discussions,

problems and ethical conflicts should not be treated in a single sided and isolated way. The interdisciplinary approach is best suited to use theoretical and methodological tools that assure differentiated competence in decision making²⁰.

In the research carried out in 2009 on the students from the specialization course in bioethics, we observed the presence of 21 undergraduate areas¹⁶, while in the stricto sensu course there were 29 areas, showing that there is now a greater interest in bioethics and its expansion to new areas of knowledge, such as Nutrition, Pedagogy, International Relations and Social Work, among others.

In an additional and parallel analysis on the profile of teachers in 2010, it was verified that they came from 13 different undergraduate courses, which also indicates the multidisciplinary as an inherent characteristic of these professionals¹⁷. However, this aspect became more evident when evaluating the profile of the UnB students, who present a greater variety and better distribution of undergraduate courses without the prevalence of medical training.

These data demonstrate that bioethics is expanding into different fields of knowledge. Especially since the 1980s, the accelerated scientific development, new technologies and management care in health systems, human migration and the consequent expansion of cultural diversity, among other things, created the need for profound changes in moral analysis and interpretation of conflicts to be solved by bioethics, which required even greater rigor in the training of professionals.

An example of the necessary renewal of old and rigid curricula is Finland, the first country in the world to recognize this initiative and extend it to the whole territory by 2020. This transformation seems to be the end of traditional education in the country and the beginning of emphasis on multi-subject and interdisciplinary teaching, thus forming a new "phenomenal" tool, as the Finnish educators put it. For years, the country's education has been among the best in the world, based not only on multi and interdisciplinary teaching, but also on teacher appreciation and stimulating different forms of learning, reaching the top of the Program for International Student Assessment (Pisa)²¹.

Universities have the challenge of responding with quality to the expectations that surround the conceptual and practical domain of bioethics, allowing the development of skills in students of diverse backgrounds and divergent opinions. The diverse professional training background of

students interested in this field indicates that this methodological resource is no longer an obstacle to the full integration of the bioethical context, as a new tool in its theoretical and practical arsenal, to properly expand and apply the knowledge produced.

Interdisciplinarity is the philosophical identity of bioethics that promotes moral values with the aim of transforming reality, aiming at justice and the common good²². Therefore, the theoretical-practical adoption of the reference of interdisciplinarity is essential to develop bioethics as a field of knowledge. Since new and old challenges require solutions, professionals in the area - according to the diverse knowledge, values and experiences provided by this methodology - must be able to act in a manner consistent with contemporary reality and the conflicts derived from it.

Final Considerations

This study raised expressive data regarding the profile and professional training background of the students who seek to include the knowledge of bioethics in their training. In addition to the greater presence of female professionals (70%), the most significant data of the sample was the wide diversity of professions of students enrolled in the program, which received students with 29 different professional backgrounds.

Graduate programs in bioethics should have, as a curricular basis, the effective dialogue between different areas of knowledge of interest in the discipline, which makes interdisciplinarity essential to enrich the training of students. Thus, future professionals will be ready to share various languages, approaches, decision-making and other actions, multiple and complementary, in an integrated way.

With the emergence of bioethics, a new curricular ethic emerges: one that is applied and transformative, aiming at more comprehensive, participative and democratic responses to current and future moral conflicts. In the context presented here, what is desired is a bioethics committed to responding to the problems and needs of the contemporary world. Among its aims is the training of professionals with greater ethical sensitivity, guided by teaching-learning programs in new fields of biomedical ethics²³ and of social ethics itself. In the behavioral sense, however, one can not forget that the bioethics studied here should be plural, that is, consider and respect the historical moral diversity of the different socio-cultural communities.

One must also take into account the relatively common misconception that problems arising in morally disparate environments admit a single solution. Imposing a uniform set of predetermined and uncritical principles on diverse cultures would be anomalous, since professionals have an obligation to interact in line with different morals. Understanding the ethical foundations for complex patterns of morally plural relations requires, in addition to proper and rigorous training, more imaginative forms of ethical reflection and decision³.

There is a worldwide concern in the quest for quality, safety and knowledge, a context that gradually widens and is no longer compatible with the single discipline view, incapable of guaranteeing security in decisions and addressing ethical problems based on different philosophical aspects of thinking and acting.

In this context, to meet this need, bioethics needs instrumentalization. There are many dilemmas to consider today, in a world with different levels of complexity. Therefore, the next generation of experts in the field of bioethics must develop skills to connect the empirical world to the real world^{24,25}, the individual to the collective, the action to the reaction, the phenomenal to the essential. The bioethical perspective of interdisciplinarity allows plural dialogues and creates other spaces for reflection, surpassing what is habitual and familiar to the exclusively one-professional scope¹⁹.

The exercise of interdisciplinarity should stimulate the search across borders, giving those

who are dedicated to its exercise the possibility of establishing transdisciplinary approaches and proposals, which means a step forward in interpreting and dealing with ethical problems.

Transdisciplinary vision and practice in academic teaching-learning processes require the professional to be able to “reconnect knowledges”, to grasp the various possible perspectives that can be directed to an object or situation in which different knowledge and information unite or separate. It is necessary to question and seek other ways of learning, not only to reproduce what is learned linearly, or to be based on the belief that a single answer can solve our doubts²⁶.

Deepening is not always synonymous with better knowing, but moving beyond restricted and linear knowledge. It also means the possibility of the professional observing the dilemmas of an issue from different angles to better know it, interpret it and define a proposal of action. In this line of reasoning, a broad training, such as the one proposed by the teaching-learning process developed in the Bioethics Graduate Program at UnB, seems to guarantee to its students, from such diverse professional backgrounds, a diversified and concretely interdisciplinary curriculum. This proposal, based especially on interdisciplinarity, among other theoretical-practical references, makes professionals who seek the paths of bioethics better able to contextualize moral dilemmas, resulting in a more plural and dynamic discipline.

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Participation of the authors

Ulises Prieto y Schwartzman, Valney Claudino Sampaio Martins and Luciana Souto Ferreira participated equally in the different stages of research. Volnei Garrafa supervised the study from its planning to the final revision.

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