



THE IMPORTANCE OF TRAINING IN HUMAN RIGHTS IN TECHNOLOGY DEGREES AS A MECHANISM TO GUARANTEE CITIZENS’ RIGHTS

A IMPORTÂNCIA DA FORMAÇÃO EM DIREITOS HUMANOS NAS GRADUAÇÕES DE TECNOLOGIA COMO UM MECANISMO DE GARANTIA DE DIREITOS DOS CIDADÃOS

LA IMPORTANCIA DE LA FORMACIÓN EN DERECHOS HUMANOS EN LAS CARRERAS DE TECNOLOGÍA COMO UN MECANISMO DE GARANTÍA DE LOS DERECHOS DE LOS CIUDADANOS.

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ABSTRACT

This study presents the importance of Human Rights education in Information Technology degree programs, based on a bibliographic review and official performance evaluation instruments from the Ministry of Education. It generally addresses: the concept of Artificial Intelligence and a discussion on the debate surrounding AI Ethics; the proposal of the Legal Framework for Artificial Intelligence in Brazil; the impact of the use of technologies on people's lives; and concludes by suggesting the inclusion of AI Ethics and the use of technologies in Information Technology undergraduate curricula. It demonstrates that these two themes are branches of Human Rights Education in Brazilian higher education and serve as strategies to ensure the comprehensive training of software developers when included in curricula. This perspective is grounded in the approach of Bill No. 2,338 of 2023, the Legal Framework for AI in Brazil, which highlights the importance of the development and responsible use of Artificial Intelligence systems and establishes, as one of its premises, the “centrality of the human person” in order to preserve fundamental rights.

Keywords: Artificial Intelligence Ethics. Human Rights Education. Legal Framework for AI in Brazil.

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RESUMO

Este trabalho apresenta a importância da formação em Direitos Humanos em cursos de tecnologia da informação, a partir de uma revisão bibliográfica e de instrumentos de avaliação de desempenho oficiais do Ministério da Educação, trazendo, de forma geral: o conceito de Inteligência Artificial e uma abordagem quanto ao debate em torno da Ética da Inteligência Artificial; da proposta do Marco Legal da Inteligência Artificial no Brasil; do impacto do uso das tecnologias na vida das pessoas; e conclui com a sugestão de previsão de ética da Inteligência Artificial e do uso das Tecnologias nos currículos de graduação em Tecnologia da Informação, demonstrando que estas duas temáticas são braços da Educação em Direitos Humanos na educação superior brasileira e que são estratégias para garantir uma formação integral dos desenvolvedores de software ao inclui-las nos currículos, ancorado na abordagem do Projeto de Lei 2.338 de 2023, Marco Legal da IA no Brasil, o qual destaca a importância do desenvolvimento e do uso responsável de sistemas de Inteligência Artificial e traz como uma de suas premissas a “centralidade da pessoa humana”, na busca por se preservar direitos fundamentais.

Palavras-chave: Ética da Inteligência Artificial. Educação em Direitos Humanos. Marco Legal da IA no Brasil.

RESUMEN

Este trabajo presenta la importancia de la formación en Derechos Humanos en los cursos de Tecnología de la Información, a partir de una revisión bibliográfica y de instrumentos oficiales de evaluación del desempeño del Ministerio de Educación. De manera general, aborda: el concepto de Inteligencia Artificial y una discusión sobre el debate en torno a la Ética de la IA; la propuesta del Marco Legal de la Inteligencia Artificial en Brasil; el impacto del uso de las tecnologías en la vida de las personas; y concluye con la sugerencia de incluir la Ética de la IA y el uso de las tecnologías en los planes de estudio de grado en Tecnología de la Información. Se demuestra que estas dos temáticas son ramas de la Educación en Derechos Humanos en la educación superior brasileña y constituyen estrategias para garantizar una formación integral de los desarrolladores de software al incluirlas en los currículos. Este enfoque se fundamenta en el Proyecto de Ley N.º 2.338 de 2023, Marco Legal de la IA en Brasil, el cual destaca la importancia del desarrollo y del uso responsable de los sistemas de Inteligencia Artificial y establece, como uno de sus principios, la “centralidad de la persona humana”, con el fin de preservar los derechos fundamentales.

Palabras clave: Ética de la Inteligencia Artificial. Educación en Derechos Humanos. Marco Legal de la IA en Brasil.

INTRODUCTION

Artificial intelligence, the ethics of artificial intelligence (AI), and the information age are movements that, according to Floridi (2023), have only just begun, and humanity has the opportunity to shape them in a positive way so that they may benefit both itself and the planet. This statement by the author is consistent, especially considering that the use of digital technologies has led to biases

that, in various situations, have put at risk the right to privacy, as well as the guarantee of citizens' civil and constitutional rights. In order to ensure rights and reduce these biases, it is necessary for society to engage constructively, following ethical principles, to analyze the challenges so that such rights and guarantees are not violated and, collectively, to design appropriate solutions (Florida, 2023).

In the context of innovation and transformation, Human Rights stand out as a multidisciplinary field that encompasses emerging concepts, such as the ethics of artificial intelligence and the use of technologies, which, when included in undergraduate technology programs, can serve as a way to guarantee citizens' rights. This is because the training of Information Technology professionals has an impact on their professional practice, fostering awareness as software developers who work with AI applications and who will use systems that employ this technology responsibly (UNESCO, 2021).

This study provides an overview of the information society and presents the ethical debate surrounding the use of technologies, exploring the approach of Bill No. 2,338 of 2023, the Legal Framework for AI in Brazil, which highlights the importance of the development and responsible use of AI systems and establishes, as one of its premises, the "centrality of the human person" in order to preserve fundamental rights (Brazil, 2023). Finally, it presents some measures which, from the author's perspective, may support the comprehensive training of software developers, grounded in ethics and responsibility in the use of technology. This demonstrates that these themes, when addressed during the educational process of these professionals in Brazilian colleges and universities, can become an extension of Human Rights in ensuring the rights of citizens.

The methodology applied consisted of a bibliographic review and the analysis of official performance evaluation instruments from the Ministry of Education, presenting the concept of Artificial Intelligence and a general approach to the debate surrounding Ethics in Artificial Intelligence; the Legal Framework for Artificial Intelligence in Brazil; the impact of the use of technologies on people's lives; and the suggestion of incorporating Artificial Intelligence ethics and the use of technologies into Information Technology undergraduate curricula.

1 HUMAN RIGHTS, ARTIFICIAL INTELLIGENCE, AND THE ETHICS DEBATE

Studies in Human Rights are multidisciplinary and, by their nature, encompass diverse fields and concepts, including emerging topics such as Artificial Intelligence (AI), which can broadly be understood as a type of artificial computational system that exhibits intelligent behavior. In the literal

words of one of the most recognized pioneers of Artificial Intelligence in the world, Marvin Lee Minsky (1985 apud Stanford, 2020), due to its relatively autonomous behavior, AI has the power to affect people's rights, which explains the relationship established here. The intention is not to restrict intelligence to that exhibited by humans, but rather to highlight that computer science has produced a range of machines that possess learning or reasoning capabilities and stand out in automating specific tasks that are generally executed and conceived by humans (Stanford, 2020).

Historically, it is worth noting that the term "AI" has been used since the 1950s, and in recent years its concept has expanded to encompass areas such as "machine learning," "natural language processing," and "data science." Around 2010, its usage broadened further, and at times nearly all of computer science—and even high technology—has been grouped under the category of "AI," which is now widely used and represents a rapidly growing industry with significant capital investment (Stanford, 2020).

The main point of debate regarding the ethics and regulation of AI lies in the fact that artificial intelligence systems can be more or less autonomous, once again highlighting their potential impact on Human Rights—that is, on citizens' rights and guarantees. The focus on its use does not presuppose which ethical approaches are most appropriate to address these issues. In this regard, Lima (2020) offers a relevant reflection: "innovation is, therefore, a continuous process, with relevant intermediate milestones, but without a defined endpoint, characterized by improvement and adaptation to the world in which we live. This continuous improvement may trigger certain ethical issues." The same author connects the concept of innovation to the ethical and philosophical debate surrounding AI ethics, presenting the perspective of the Swedish philosopher Nick Bostrom, who understands that the morality and ethics embedded in these systems are reproductions of the moral constraints to which humans are subject in their relationships with contemporary AI systems, all based on responsibilities, perspectives, biases, and understandings of relationships with others (Lima, 2020). The multidisciplinary nature of Human Rights, their relationship with ethics, and the centrality of the human person are contemporary concerns that this work seeks to highlight as themes that should be explored during the educational process of technology professionals, as they are the primary designers of such intelligent systems.

The ethical debate, the concern for the human person, and the guarantee of Human Rights and citizens' rights resonate with the essence sought in the Legal Framework for AI in Brazil and are reinforced in the research by Marcato (2022), who argues that the debate on AI ethics is related to what programmers and developers—professionals who create these algorithms—must observe when introducing new artificial intelligence systems to the market. The entire issue must be centered on

human beings, in order to develop greater trust in technological solutions used across various social sectors. The researcher further states that “in addition to being concerned with the development of systems that take into account the human condition, with all its particularities, ensuring the non-violation of fundamental rights and guarantees,” it is also necessary to ensure another value, namely transparency (Marcato, 2022).

What is intended, based on what has been presented, is to demonstrate the correlation between ethics and artificial intelligence and its impact on citizens' lives. This relationship can be analyzed from various perspectives, and here the focus is on the Human Rights perspective. According to Marcato (2022, p. 112), one of the concerns regarding these systems relates to the “processing of data, its respective legal regulation, and how this impacts citizens' lives,” as well as how those who use these systems will interpret the data resulting from AI analyses. The researcher continues:

Another ethical perspective to be considered concerns the system programmer who uses artificial intelligence as a technology to perform tasks [...] and what paradigms should be observed by the programmer so that the final result is fair [...] the focus is on the methodology used by the programmer in building the system and, furthermore, on the analysis of the result of this application: the algorithm (Marcato, 2022, p. 112).

The understanding reached is that Human Rights, due to their multidisciplinary nature, broadly encompass debates on ethics, technology, and innovation. In this sense, one of the central objectives of this research is to review national and international literature in order to identify and systematize the main studies on Ethics in Artificial Intelligence, with special attention to the impact of the use of technologies and autonomous systems on citizens' lives.

2 HUMAN RIGHTS AND THE LEGAL FRAMEWORK FOR ARTIFICIAL INTELLIGENCE IN BRAZIL

The widespread use of technologies and artificial intelligence has completely transformed the way people, across various areas of human activity, deal with their processes. Furthermore, there are several projections indicating that artificial intelligence (AI) will bring about profound economic and social changes in the coming years (Brazil, 2023). A natural consequence of this transformation is the need for regulation, especially regarding the guarantee of citizens' rights, a subject encompassed within Human Rights.

The understanding that regulation is necessary is reinforced by the very justification of Bill No. 2,338 of 2023, which presents a proposed law governing the use of Artificial Intelligence as a

result of the consolidation of various initiatives related to AI regulation in Brazil, as it explicitly states that due to:

[...] given the relevance of this issue, some legislative proposals have recently been presented, both in the Federal Senate and in the Chamber of Deputies, with the aim of establishing guidelines for the development and application of artificial intelligence systems in Brazil. In particular, the following stand out: Bill No. 5,051 of 2019, authored by Senator Styvenson Valentim, which establishes principles for the use of Artificial Intelligence in Brazil; Bill No. 21 of 2020, by Federal Deputy Eduardo Bismarck, which establishes foundations, principles, and guidelines for the development and application of artificial intelligence in Brazil and provides other measures, and which was approved by the Chamber of Deputies; and Bill No. 872 of 2021, by Senator Veneziano Vital do Rêgo, which addresses the use of Artificial Intelligence. On February 3, 2022, these three bills began to be processed jointly in the Federal Senate. (Brazil, 2023, p. 27).

The aforementioned bill is fully aligned with the recommendation of UNESCO (2021), an organization that has the defense of Human Rights as one of its core principles. UNESCO, the United Nations Educational, Scientific and Cultural Organization, presents a series of points of attention regarding the rapid advancement of artificial intelligence technologies and their impacts on the market and on citizens' lives:

It recommends that Member States voluntarily apply the provisions of this Recommendation by taking appropriate measures, including any legislative or other measures that may be necessary, in accordance with the constitutional practices and governance frameworks of each State, to give effect, within their jurisdictions, to the principles and norms of the Recommendation, in line with international law, including international human rights law. (UNESCO, 2021).

In this same sense, the protection of Human Rights is explicitly addressed in the Legal Framework for AI in Brazil, which is currently under consideration in the National Congress. This legal instrument has two clear objectives: (1) to establish and guarantee rights to protect the most vulnerable party in this context—the individual, the citizen—who is daily impacted by artificial intelligence systems, whether through routine content recommendations or targeted advertising on the Internet, which are very common on social media; and (2) to “provide governance tools and an institutional arrangement for oversight and supervision, creating conditions of predictability regarding its interpretation and, ultimately, legal certainty for innovation and technological development” (Brazil, 2023).

The protection of the rights of the human person—the citizen—is a central concern of Human Rights, and the regulation of AI use encompasses all stages or life cycles of these systems. In other words, the issue must cover everything from research, design, and development to implementation and use, the latter being the stage that most directly affects the population at large. Regulation must also include maintenance, operation, commercialization, financing, monitoring and

evaluation, validation, decommissioning, dismantling, and the termination of these systems (UNESCO, 2021).

Analyzing Bill No. 2,338 of 2023, which addresses the Legal Framework for AI in Brazil, it is evident that it aligns with the Recommendation on the Ethics of Artificial Intelligence published by UNESCO in 2021. Within the scope of these recommendations, the organization defines AI actors as any actors involved in at least “one stage of the AI system life cycle, and they may refer to both natural and legal persons, such as researchers, programmers, engineers, data scientists, end users, companies, universities, and public and private entities, among others” (UNESCO, 2021).

Thus, from a credit approval analysis to a simple display of a post on a citizen’s social media timeline, AI is present. Therefore, the focus here is to present what exists—and what is being pursued—regarding regulation for the protection of fundamental rights such as democratic values, privacy, and personal data protection, as well as non-discrimination and the centrality of the human person. This latter concept is enshrined in the Federal Constitution of 1988, in Article 1, which, although it may seem unnecessary to reiterate, reinforces the focus on Human Rights.

The demonstration of the relationship between Human Rights, the Ethics of Artificial Intelligence, and the use of technologies is based on the understanding that such approaches represent a branch of Human Rights Education. This perspective is grounded in what the National Plan for Human Rights Education (PNEDH)—a guiding document for this field in national education, launched in 2003—presents as a general vision of respect for values that preserve fundamental rights and guarantees, which must be addressed at all levels of education, both formal and non-formal (Brazil, 2018).

The Plan is based on international and national documents, through which Brazil’s role in the history of the affirmation of human rights is established, defining as guiding objectives:

[...] (a) to strengthen respect for human rights and fundamental freedoms; (b) to promote the full development of the human personality and dignity; (c) to foster understanding, tolerance, gender equality, and friendship among nations, Indigenous peoples, and racial, national, ethnic, religious, and linguistic groups; (d) to encourage the effective participation of individuals in a free and democratic society governed by the rule of law; (e) to build, promote, and maintain peace. (Brazil, 2018).

It is important to highlight that, as established by the PNEDH itself, “the implementation of the National Plan for Human Rights Education aims, above all, to disseminate a culture of human rights in the country” (Brazil, 2018). From the perspective of training technology professionals, the affirmation of principles that defend the human person has a direct connection with the proposal of the Legal Framework for Artificial Intelligence in Brazil, as this study has sought to demonstrate.

3 HUMAN RIGHTS AND THE IMPACT OF THE USE OF TECHNOLOGIES ON PEOPLE'S LIVES

The Legal Framework for AI establishes as one of its premises the “centrality of the human person,” as stated in Article 2, item I, of Bill No. 2,338 of 2023. What can be understood from this is that, in order to place the human person at the center of the implementation and use of artificial intelligence systems in Brazil, it is necessary to guarantee and preserve fundamental rights and guarantees, including the right to privacy—all of which are encompassed within Human Rights. The use of digital technologies in various aspects of people's lives also has implications in the sphere of continuous surveillance, meaning that at all times there are artificial intelligence systems processing data collected from individuals.

There is a general understanding that advances in technology and the digital transformation of businesses positively impact the economy and increase productivity, whether by reducing costs or cutting waste—of time or raw materials. However, this revolution, on the other hand, has been putting pressure on the labor market regarding people's roles, since, at an unprecedented pace, as a consequence of recent advances, “machines and intelligent algorithms are taking over tasks ranging from repetitive and routine activities to cognitive ones” (CNI, 2020). In other words, machines are occupying spaces that were previously exclusive to humans. Similarly, from the perspective of information systems, tens or even hundreds of thousands of robots and bots are currently operating, working in place of people with data collected from individuals, while these individuals maintain their presence in digital networks and virtual environments.

Information provided by PricewaterhouseCoopers (PwC), in the report entitled “The Digital Divide in Brazil,” presents both an alarming and positive finding: the technology sector in Brazil will require thousands of new technology professionals in the coming years (PwC, 2022). The same report states that:

With the advancement of artificial intelligence and automation, many traditional roles are being eliminated or replaced worldwide. Roles that accounted for 15.4% of the global workforce in 2020 are expected to shrink to 9% by 2025. On the other hand, the share of new professions (such as data and artificial intelligence specialists) will nearly double, growing from 7.8% to 13.5% of the total workforce over the same period (PwC, 2022).

One perspective that can be inferred from the excerpt presented, based on the research portraying the digital divide in Brazil produced by PwC (2022), is that these new professionals — trained in a context where there is urgency for their insertion into the productive sector — reinforce the importance and necessity of a focus on the development and application of tools that, above all, respect Human Rights, the Rights of Man, and the Rights of Citizens.

The topic is controversial and subject to divergent views; therefore, the proposal is to analyze it from an ethical-normative perspective, such as the opinion of Nigel Cameron, senior researcher at the University of Ottawa (2017 apud CNI, 2020), whose view is somewhat more pessimistic regarding the advancement of AI. He “warns that human workers will be competing with another ‘species,’ cheaper to employ and with the additional advantage of continuously evolving into more intelligent forms; the risk is that sufficient opportunities will not be created for humans whose skills will no longer be relevant.” This is not what more recent studies indicate, such as the data presented by PwC (2022), which highlights that the technology sector in Brazil will require thousands of technology professionals in the coming years. Once again, this underscores the need for a Human Rights-oriented educational perspective among these professionals.

This conclusion is based on the space that artificial intelligence has been occupying, especially because it is one of the pillars of Industry 4.0 and one of its enabling technologies. Machine learning techniques, “Machine Learning,” “Deep Learning,” and others automatically improve systems and increase predictive accuracy, as well as facilitate customization. Artificial Intelligence algorithms, as presented in the report by the National Confederation of Industry:

Use databases, identify trends, and simulate scenarios, contributing to supply chain planning, forecasting seasonality, and better understanding consumer expectations, among numerous other benefits. By adding value to human work, AI is transforming tasks and functions, processes, and business models (CNI, 2020).

What this article seeks to present is a perspective on how the Legal Framework for Artificial Intelligence in Brazil, from the standpoint of the ethical-normative debate and the impact of these technologies on people’s lives, can contribute to the consolidation of principles that protect the human person, particularly when these principles begin to be incorporated as subjects or content in the training programs of Information Technology professionals, such as the discipline of Human Rights itself.

Shifting slightly from the discussion of the displacement of human labor to the risks of privacy invasion or the violation of fundamental rights and guarantees, it is observed that Bill No. 2,338 of 2023 is also concerned with algorithmic impact assessment. It dedicates a specific section to this issue, stating that there is a need for “algorithmic impact assessment to be carried out by a professional or a team of professionals with the necessary technical, scientific, and legal knowledge to prepare the report, and with functional independence” (Brazil, 2023).

What this study seeks to highlight is that, for these professionals to be prepared to carry out the task of analyzing the algorithmic impact of artificial intelligence tools, it is necessary that they are sensitive to the principles established by the Legal Framework for Artificial Intelligence. In other

words, it is essential that the curricula of Information Technology training programs include and encourage the development of this responsible perspective and the ethics of AI systems, from a Human Rights standpoint.

4 HUMAN RIGHTS IN INFORMATION TECHNOLOGY UNDERGRADUATE CURRICULA

Undergraduate programs in technology are regulated by the Ministry of Education (MEC) and have their minimum content defined in the National Curriculum Guidelines (DCN) for undergraduate courses at the bachelor's level, or in the National Catalog of Higher Technology Courses (CNCST) for technological degrees. These instruments, which guide the minimum curricular content to be fulfilled by Higher Education Institutions (HEIs) in Brazil particularly in the field of Information Technology establish that professional practice must be ethical, responsible, and in accordance with professional regulations, that is, within the scope of Human Rights.

The CNCST, as mentioned, explicitly states that for professional practice as a technologist, “ethics and respect in professional practice” are fundamental (Brazil, 2024). Similarly, the National Curriculum Guidelines (DCN) for undergraduate programs in the field of Computing establish in Article 4 that “bachelor's and licentiate degree programs in Computing must ensure the training of professionals endowed with: I – knowledge of social, professional, legal, ethical, political, and humanistic issues” (Brazil, 2016).

In this same line, when analyzing the evaluation process of students' performance in Information Technology undergraduate programs whether technological, bachelor's, or licentiate degrees it is observed that there is still concern regarding the inclusion of such themes when assessing how students have been trained during their studies. In this context, the exam guidelines and specific components assessed for graduates in the field of Computer Science (Bachelor's degree), within the scope of the National Student Performance Exam (ENADE), 2021 edition the most recent for the field, held every three years highlight in Article 5 that “the ENADE 2021 exam, in the specific component of the Computer Science – Bachelor's degree area, will take as a reference for the graduate profile the following characteristics: [...] III – ethical and reflective regarding the impact of computing and its technologies on society and the environment” (Brazil, 2021a).

However, although ethics and the responsible use of technology are included in curricula, this is not reflected in the ENADE assessment. It is not possible to determine whether this is due to the breadth of the content to be covered, the limited scope of the exam, or simply the lack of prioritization of the topic. What can be stated is that in recent editions of the National Student

Performance Exam (ENADE) for the field of Information Technology, there were no questions addressing ethics or the responsible use of technology (Brazil, 2021b).

In this context, it can be inferred that the topic of Human Rights understood here as the ethics of artificial intelligence, the ethics of technology use, and the ethics of professional practice does not yet have a guaranteed space in these programs. As presented, this is not necessarily due to negligence; however, allocating dedicated instructional time to address this topic is of great importance, given its cross-cutting and multidisciplinary nature.

5 RESULTS AND DISCUSSION

This section presents the results and some analyses based on the research strategy outlined in the methodology.

From the review presented in the proposed methodology, it is possible to understand that normative instruments, content guidelines, and performance evaluation criteria for professionals graduating from Information Technology programs, as well as the overarching objective of the National Plan for Human Rights Education which, as stated, “aims above all to disseminate a culture of human rights in the country” (Brazil, 2018) support the view that it is not an exaggeration to propose strengthening strategies to raise awareness among professionals regarding ethics and the responsible use of technology within their training programs.

This is the conclusion reached from the review of the guiding documents, namely: the National Curriculum Guidelines (DCN) for undergraduate programs in Computing (Brazil, 2016); the exam guidelines and specific components assessed for graduates in Computer Science (Bachelor's degree) within the National Student Performance Exam (ENADE) (Brazil, 2021a); and the National Catalog of Higher Technology Courses (Brazil, 2024). The review of these documents demonstrated that all of them include ethics and professional responsibility as key components in technology training. However, in the ENADE exam for the Information Technology field, no questions addressing this topic were included (Brazil, 2021b), which supports the assertion that it is reasonable to conclude there is a need to incorporate the ethics of artificial intelligence and the responsible use of technologies into undergraduate Information Technology programs.

The objective here is not to claim negligence on the part of any of the actors involved in the process, but rather to emphasize that there is room for improvement in the roles of faculty, Higher Education Institutions, and the government understood here in a broader sense as the public sector.

Once again, it is emphasized that the rationale for linking the ethics of artificial intelligence and the responsible use of technologies as a branch of Human Rights Education in technology undergraduate programs lies in addressing the issue at its origin that is, in shaping the education of professionals who develop these artificial intelligence systems.

6 THE IMPORTANCE OF THE ROLE OF THE FACULTY

The faculty members of a Higher Education Institution (HEI) are the first professionals in the field with whom students who intend to graduate in that area have contact. Therefore, from the perspective of career development and professional ethics, they serve as references for those who will become future professionals in the technology field. This highlights the importance of adequately preparing these professionals.

In addition to serving as professional role models for students, faculty members are part of academic committees that have the autonomy to adjust programs and, more importantly, to establish pedagogical proposals for teaching, research, and extension activities that contribute to the comprehensive education of undergraduate students. One example of such a committee is the Structuring Teaching Nucleus (NDE) of the course, which “is composed of a group of faculty members with academic responsibilities for monitoring and actively participating in the process of designing, consolidating, and continuously updating the course’s pedagogical project” (Brazil, 2010). It is important to note that the NDE is also responsible for “indicating ways to encourage the development of research and extension lines arising from undergraduate needs, labor market demands, and aligned with public policies related to the course’s field of knowledge” (Brazil, 2010).

Faculty members in undergraduate technology programs play a central role in the education of future professionals who will develop artificial intelligence systems. Their work, from the perspective of Human Rights, Ethics, and the responsible use of technologies, aligns with what the National Plan for Human Rights Education (PNEDH), in its conception and principles for higher education, highlights when it emphasizes the relationship between higher education and the continuous contribution to professional training, as well as the maintenance of “a relationship of service and reciprocity with society” (Brazil, 2018). This is also reflected in its encouragement of the “development of pedagogical methodologies of a transdisciplinary and interdisciplinary nature for human rights education in HEIs” (Brazil, 2018).

In this context, faculty members become agents of extreme importance in the process of ethical training in the use of technologies for future graduates of Information Technology programs.

They also become key figures in the multiplication and dissemination of the preservation of Human Rights.

7 FINAL CONSIDERATIONS

Considering the context of regulation, the definition of principles and curricular guidelines, and the inclusion of these themes in assessment processes during academic programs, it is important to highlight that, as established by the PNEDH itself, within the programmatic actions of higher education, it is the responsibility of public authorities to “support the creation and strengthening of forums, centers, committees, and research and extension groups aimed at promoting, defending, protecting, and studying human rights in Higher Education Institutions (HEIs)” (Brazil, 2018).

The focus here is on proposing structured actions by public authorities to maintain and disseminate a culture of respect for fundamental rights and guarantees among future technology professionals graduating from these HEIs. In this sense, Human Rights Education can consolidate its role as, in a broad sense, the “strengthening of individual and social practices that generate actions and instruments in favor of the promotion, protection, and defense of human rights, as well as the reparation of violations” (Brazil, 2018).

From the review of the instruments that establish the minimum content for Information Technology undergraduate programs, it is possible to observe that the subject of Ethics and responsible professional practice is included in curricular guidelines, both in training and evaluation stages. However, the topic of the responsible use of technology and even more so the responsible implementation of Artificial Intelligence systems has not been required in the assessments of higher education graduates. Therefore, there is clear room for improvement in addressing these topics, both from the perspective of technologies such as Artificial Intelligence and, more broadly, regarding the use of emerging technologies.

This conclusion is drawn from the fact that, although the topic is included in curricula, it is not reflected in applied performance assessments. This statement is based on the analysis of the aforementioned instruments. It is not possible to determine whether this absence is due to the breadth of the content to be assessed, the limited scope of the examination, or simply the lack of prioritization of the topic. However, this is what the analysis reveals, which reinforces the importance of Human Rights education in technology degree programs particularly from the perspective of the roles of faculty, institutions, and public authorities. Faculty members, as the first professionals with whom future developers of artificial intelligence systems come into contact, bear the responsibility of

understanding the importance of these issues within the institutional context and the academic bodies to which they belong, supported by institutional policies of HEIs. Public authorities, in turn, as outlined by the PNEDH, are responsible for strengthening practices in which individuals and society generate actions and instruments that promote, extend protection, and defend human rights, as well as ensure the reparation of violations.

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