Editorial

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Artificial intelligence in scientific publishing: ethical and legal issues

Inteligência artificial na publicação científica: questões éticas e jurídicas

Inteligencia artificial en las publicaciones científicas: cuestiones éticas y legales

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Defining intelligence is to salute when humanity proposes to use an intelligence called artificial, which make us then question what would be considered natural intelligence? Therefore, intelligence is the ability of human beings to be dependent on analogical thinking, which cannot be generated by digital equipment, since the human brain is capable of doing unimaginable thingssomething that computers will never be able to do[1].

The Theory of Multiple Intelligences states that each individual has seven primary intelligences: logical-mathematical, verbal linguistic, interpersonal, intrapersonal, bodily-kinesthetic, visual-spatial, and musical intelligence[2].

Artificial Intelligence (AI) refers to the ability of a machine to reproduce human-like skills, such as logical thinking, learning, planning, and creativity[3]. However, this machine, unless commanded and controlled by a person, does not presents all intelligence domains. So if the goal is to reproduce the human thinking capacity, this activity cannot be an artificial intelligence, but rather an artificial brain, which refers to the ability of learning with a physical concept and controlled by human intelligence[4].

AI has existed since the mid-1950s and, although its history is intertwined with the emergence of the first computers, it has only recently begun to be widely disseminated and used. Since than, there is a lurking concern that AI could replace humans personal and work activities.

However, we present some factors that suggest otherwise: The human brain does not work like a computer; the connections of the human brain are not based solely on logic; the decisions made by a human brain are not binary; the human brain is not a digital machine, we learn in a different way than a computer system and human intelligence cannot be transferred to a mathematical formula.

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To claim that AI could replace human beings is an attempt to reduce our human condition to secondary or subservient to the machines we have created[1], however, humans perform activities that computers will never be able to perform such as engaging, feeling, loving, and making friends.

If we agree with the assumption that machines will replace us, we are admitting to be faced with future generations that do not want to think nor be active in discoveries, in the development of human beings and in the growth of the world. We agree that professionals are dispensable and that they can no longer be called intelligent as defined by the Theory of Multiple Intelligences.

This raises another concern: If humans are the ones who control the machines, algorithms, and neural networks created in computers, the ethics that are necessary to use AI will be determined and carried by humans themselves. Therefore, what will be done ethically with the use of AI must be defined and controlled in a responsible, transparent, and reliable manner, guided by the principles of beneficence, non-maleficence, autonomy, justice, and applicability.

The use of AI in scientific works and publications has originated an intense debate on legal issues that need to be carefully analyzed. Although technological evolution brings countless benefits, it also surfaces a need for adaptations and regulatory developments to ensure that the research remains appropriate and ethical.

In view of the presented facts, Brazil takes an important and significant step to regulate and promote the responsible use of AI with Bill No. 21/2020 – Legal Framework for the Development and Use of AI[5].

One of the main issues that arise in the debate is copyright protection, which according to the Brazilian Copyright Law[6], the authorship of the research must be granted to the individual who did it. Thus, the following question: how to attribute the authorship of an article written by a robot? Until now, works generated by AI are usually granted to the creators or employees of the company that maintains the technology, however this reasoning tends to evolve, following the rise and autonomy of AI.

A point that should not be ignored in this discussion is Ethics within the scientific world. Based on the Declaration of Helsinki and the standards of the National Council for Scientific and Technological Development (*Conselho Nacional de Desenvolvimento Científico e Tecnológico* – CNPq), it is emphasized the importance of completeness and sincerity in research[7-8].

The utmost care is necessary when using AI to examine large volumes of data, since the lack of knowledge and precision can result in errors if the algorithms are not built and presented according to the programming rules or if they are based on partial data. Therefore, it is responsibility of the researchers to validate the results generated by the AI, ensuring the accuracy and veracity of scientific publications[7-8].

The issue of legal liability is another important point to be addressed. In instances of errors or negative results originated from the use of AI in scientific studies, it is extremely important to determine who will be held responsible for them. In these cases, the responsibility may fall on the developers of the technologies, the researchers, or even the institutions that support or promote the research.

Since this is a complicated issue, it still lacks specific regulations. Therefore, the regulation and supervision of the use of advanced technologies have been monitored by regulatory agencies, such as the Brazilian Data Protection Authority (*Autoridade Nacional de Proteção de Dados* – ANPD) and CNPq, which plays a fundamental role in implementing norms and standards that guide the use of AI in scientific studies, thus ensuring scientific integrity[7,9].

It can be concluded that AI has the power to transform the scientific world, but it brings with it several legal factors that must be analyzed so that the effectiveness and ethics of scientific research are respected, avoiding the disqualification of the veracity of scientific works and thus, maintaining an unshakable quality in the scientific pillars.

So, assuming the appropriate ethical precepts, we present the areas where AI can be absorbed in scientific publishing to facilitate the evaluation of scientific manuscripts, without replacing the editors and scientific reviewers of the journals, but rather, supporting them. Examples include: the recognition of meanings in texts and speeches, which can enable communication with humans and be used as article screening, grammar and style review; data and metadata extraction; similarity detection; machine translation; co-authorship suggestions;

AI-assisted peer review; automatic sorting and indexing; detection of unethical practices in the publishing; review of scientific content; analysis and availability of images and graphs; revision of format and layout; extraction of information from figures and tables; analysis of conflicts of interest; classification of articles into categories that are not strictly defined; detection of payment for subsequent emission of invoice; and organization of registrations.

In this way, AI is designed not to replace humans, but to assist them, and in turn, we must control it according to ethical standards. The goal is to make the work faster and more practical, an objective envisioned by humans since the first Industrial Revolution.

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