

ARTIFICIAL INTELLIGENCE IN ACADEMIC WRITING: WHAT IS IN STORE WITH THE GPT-3 ALGORITHM?

INTELIGÊNCIA ARTIFICIAL E ESCRITA ACADÊMICA: O QUE NOS RESERVA O ALGORITMO GPT-3?

INTELIGENCIA ARTIFICIAL Y ESCRITURA ACADÉMICA: ¿QUÉ NOS RESERVA EL ALGORITMO GPT-3?

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ABSTRACT: The aim of this study is to discuss the possible impacts of artificial intelligence, with a focus on the GPT-3 algorithm, on academic written production. This algorithm produces content based on the learning of more than 170 billion parameters of the World Wide Web, a huge database that represents about 0.06% of Wikipedia's content. The user can create, with this database, sentences, paragraphs, dialogs, images, and book chapters, which follow standardized grammatical norms, just by inserting an initial command, such as “studies show”. We carried out bibliographical research taking the main objective as a starting point and then, we defined the problem, raised the relevant citations, deepened the search, and established a relationship with the sources obtained. The results point to the similarity of texts produced using the GPT-3 to human compositions, making it difficult to identify authorship and differing by bringing references to used sources, which makes us think about the ethical, creativity and intellectual property aspects that may be involved.

KEYWORDS: Artificial intelligence. Academic writing. GPT-3 algorithm.

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RESUMO: O objetivo deste estudo é discutir os possíveis impactos da inteligência artificial, com foco no algoritmo GPT-3, na produção escrita acadêmica. Esse algoritmo produz conteúdo com base na aprendizagem de mais de 170 bilhões de parâmetros constantes na rede mundial de computadores. O usuário pode criar, com esse banco de dados, frases, parágrafos, diálogos, imagens e capítulos de livros, que seguem normas gramaticais padronizadas, bastando apenas a inserção de um comando inicial, como “estudos apontam”. Realizamos uma pesquisa bibliográfica tomando o objetivo central como ponto de partida para delimitarmos o problema, levantarmos as citações relevantes, aprofundarmos a busca e estabelecermos relação com as fontes obtidas. Os resultados apontam semelhanças de textos produzidos com o uso do GPT-3 a composições humanas, dificultando a identificação da autoria e se diferenciando por trazer referências a fontes utilizadas, o que nos faz pensar acerca dos aspectos éticos, de criatividade e de propriedade intelectual implicados.

PALAVRAS-CHAVE: Inteligência artificial. Escrita acadêmica. Algoritmo GPT-3.

RESUMEN: El objetivo de este estudio es discutir los posibles impactos de la inteligencia artificial, centrándose en el algoritmo GPT-3, en la redacción académica. Este algoritmo produce contenido basado en el aprendizaje de más de 170 mil millones de parámetros contenidos en la World Wide Web, una enorme base de datos que representa aproximadamente el 0.06% del contenido de Wikipedia. El usuario puede crear, con esta base de datos, oraciones, párrafos, diálogos, imágenes y capítulos de libros, que siguen normas gramaticales estandarizadas, simplemente insertando un comando inicial, como “punto de estudio”. Realizamos una búsqueda bibliográfica tomando como punto de partida el objetivo principal y, luego, definimos el problema, planteamos las citas relevantes, profundizamos la búsqueda y establecimos una relación con las fuentes obtenidas. Los resultados apuntan a la similitud de los textos producidos utilizando el GPT-3 con composiciones humanas, dificultando la identificación de autorías y diferenciando al traer referencias a fuentes utilizadas, lo que nos hace pensar en los aspectos éticos, la creatividad y la propiedad intelectual involucrados.

PALABRAS CLAVE: Inteligencia artificial. Escritura académica. Algoritmo GPT-3.

Introduction

In the last decade, we have experienced the emergence and enhancement of local and global social conflicts. Often, the problems of specific contexts end up impacting other places, especially when we talk about countries with high economic power. Some of these themes are the production and dissemination of false news, emerging forms of communication, and the impact of artificial intelligence algorithms on language production. In this sense, we have witnessed human actions in different spheres, such as environmental and interpersonal relationships.

Artificial intelligence has been part of our society for decades. It was recognized⁶ from the research of Turing (1950) and the idea that a machine and a human being can have equivalent knowledge. Since then, several artificial intelligence experiments have been used, in our daily lives, to direct our experiences. Some examples can be observed: in urban transportation apps that build a decision structure to allow the driver to choose the best route, analyzing a series of variables (location, costumer's profile, driver evaluation, etc.); when we try online dating apps that work through multi-platforms of locating people –, in addition to profile information provided by the user, they analyze data from the history of other combinations and find people geographically close; when we use an intelligent sweeping robot, we use sensors and intelligent algorithms; when we browse social networks, the displayed ads relate to the items we searched for in search engines; or even when we interact with virtual assistants.

Algorithms that generally explore a historical database produced by us are responsible for customizing the user experience. For example, they recommend products, services, or content through filtering by association and filtering by content. Actions like these became possible due to the increase in the processing power of computers, which allowed a greater capacity for natural language processing, machine learning, storage, and processing of a large volume of data. Natural language processing, such as the GPT-3 algorithm, has been used for different purposes, such as implementing customer service robots and the automatic generation of thematic texts.

The GPT-3 algorithmic artificial intelligence turns to written production in which texts are generated from initial human commands, such as a sentence, such as "studies point out..." or a command, "draw a circle." However, all the following procedures until the final product oversee the model itself. Thanks to an enlarged-scale database, the GPT-3 introduces a new dimension to the universe of writing algorithms, as it covers various textual genres and vocabularies. In addition, the algorithm brings the possibility of referencing citations, which demands, as in any academic writing, reflection on creativity, intellectual property, and authorship. It is worth asking, in this sense, to whom these texts belong and in which contexts we would be able to use algorithmic models capable of producing literary, academic texts, operating manuals, among others.

⁶ Although Turing is considered the "father" of Artificial Intelligence, "[a] AI was anticipated in the 1840s by Mrs. Ada Lovelace. More precisely, she anticipated a part of AI focusing on symbols and logic, without looking at neural networks or evolutionary and dynamic AI. Nor did she turn to the psychological objective of AI, as her interest was purely technological" (BODEN, 2020, p. 20, emphasis added).

Given the aspects above, the general objective of this article is to discuss the possible impacts of artificial intelligence, specifically the GPT-3 algorithm, on academic written production. In this discussion, we conceive concepts of creativity from contemporary discourses on content production using computer programs, aspects of intellectual property, and authorship of texts generated on statistical language model platforms, in addition to the ethical implications of using the GPT-3 algorithm for academic writing.

This work is bibliographic research. Through it, we outline the methodological aspects of proposing bibliographical research on the central theme of this study. Then, we explore concepts related to artificial intelligence and algorithms for written production, specifically GPT-3. Soon after, we discussed meanings about the notion of contemporaneity academic writing. Later, we deal with the idea of creativity in ubiquitous communication. Then, we ponder copyright and intellectual property in addition to legal discourse. Finally, we present some considerations and questions arising from the reflections undertaken.

Research Methodology

We chose a bibliographic search approach to carry out this study. We adopt Paiva's conception (2019, p. 60) about this methodological procedure, which distinguishes bibliographic research from a literature review because the first "goes beyond the mere search for information and is not a simple compilation of the results of these searches." Thus, the selected methodology is not limited to describing the data in the researched sources; it also requires establishing relationships and comparisons between the information.

We formulated the title Artificial intelligence and academic writing from our research questions: what does the GPT-3 algorithm reserve for us? Then, we selected terms that denoted its content, arriving at the delimitation of the problem theme, the first step suggested by Pizzani *et al.* (2012) to carry out a literature search. After, with the named terms, both in Portuguese and in English, we proceeded with the subsequent steps, also highlighted in italics: survey and recording of relevant citations, and deepening of the search, considering theoretical references, especially from the last three to five years, in addition to authors such as Benzon (2020), on artificial intelligence and the GPT-3 algorithm, Burwell (2013), to start the discussion on the concept of creativity and intellectual property, and Casanave (2019); Russell-Pinson and Harris (2019) for the section on academic writing.

The wanted step designated relationship of sources indicates that, in this research, we used informational sources of the three types classified by Pizzani *et al.* (2012): as primary

sources, articles, and book chapters; secondary ones, bibliographic review articles; and third ones, materials available online in databases. In CAPES's (Coordination for the Improvement of Higher Education Personnel) database, we carried out the source localization phase. It is a textual database that allows us to obtain the full texts of the articles.

Finalizing the sequence of steps by Pizzani *et al.* (2012) to execute a bibliographic search, we read and summarized informational sources. Then, the themes were divided according to specific topics so that the final phase, called the writing of the work, could begin, as we will see in the later sections.

With this script, we intend to contribute to the promotion, in a broad sense, of a multidisciplinary dialogue (MOITA LOPES, 2006) of Applied Linguistics as social science (CELANI, 2017; SEALEY; CARTER, 2004) with the theoretical bases of the areas of Communication and Media, Computer Science and "digital" theories, as Buzato *et al.* (2013).

We organize the following sections, a) offering an overview of our understanding of artificial intelligence and how the GPT-3 algorithm fits into it; b) analyzing contemporary academic writing, with an emphasis on writing scientific papers; c) pointing out, within the scope of the contemporary discourse of ubiquitous communication, the possible ways to understand the concept of creativity; d) punctuating the possible views on copyright and intellectual property of texts generated in statistical language model platforms; e) warning about the paths that we have already started to tread, without realizing it.

GPT-3: Is it the future?

The development of Artificial intelligence (AI) aims to solve problems that, until then, were only solved by humans. This technology refers to the artificial reproduction of the human mind, simulating its cognitive aspect, offering predictions, decision making, and repetitions. This reproduction happens by reading and analyzing the calculation of data and codes received. According to Cope, Kalantzis, and Sears (2020), the difference between artificial intelligence and human intelligence lies in AI being below human intelligence. It can only calculate from data used for learning. However, according to Kaufman and Santaella (2020), artificial intelligence is different from human intelligence because it performs such calculations in a more agile and accurate way, often executing more effective and assertive answers but using a representation of knowledge.

To understand what Artificial Intelligence is, Russell and Norvig (2021) analyzed eight definitions. At first, the definitions were organized based on two main themes:

thought/reasoning processes and behavior and, further, subdivided into four categories: systems that think like humans, systems that act like humans, systems that reason, and systems that act rationally. Although these four categories are historically considered relevant in knowledge production, a tension involving human-centered approaches and those focused on rationality is evident. The authors explain that human-focused approaches integrate empirical science, working with hypotheses and experiments, while rationalist approaches combine mathematics and engineering. Agreeing with this tension, Wang (2019) also reports that after analyzing some AI concepts, there is no consensus between the definitions. Furthermore, he states that the purposes cannot be understood as right or wrong, as each one's foundation in theoretical and practical criteria influences the research trajectory.

According to Taulli (2020), there are two main types of AI: weak and strong. The strong (or Artificial General Intelligence - AGI) concerns the reasoning of the intelligence itself; the machine really "thinks," not only reproduces lines of reasoning from what has learned and absorbed. The Weak AI is artificial intelligence concentrated on specific tasks; that is, the machine thinks exclusively from and about the task requested of it, such as Alexa, Siri, or Cortana. Virtual assistants whose purpose is to perform tasks proposed by the user through voice command, having as functionalities, scheduling appointments, checking the time, scheduling alarm clocks, sending messages, or adjusting settings. It is worth pointing out that, according to Kaufman and Santaella (2020, p. 3), "the current stage of development of artificial intelligence (AI) is still restricted." However, the strong and weak names do not do justice to the potential of technology, which has increasingly shown its capabilities, especially about its machine learning subfield.

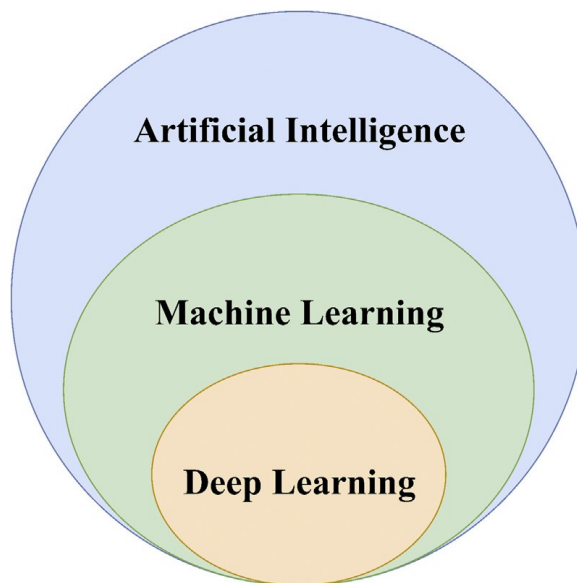
Recently, startup Uber reported that seeking innovation is investing in machine learning to protect its customers, identifying risks based on data collected from the millions of daily trips. Machine learning (ML) is about computer learning and improving it from a representation of original knowledge. The algorithm learns from a database, evolves the understanding, and based on it, can make decisions. As explained by Kaufman and Santaella (2020, p. 4), "ML explores the study and construction of algorithms that, following instructions, make predictions or make decisions based on data – models made from samples." This process takes place through data collection and the use of statistical techniques.

ML has different types of learning, such as the semi-supervised method, the reinforcement method, and, finally, the most used method, the supervised method (DOMINGOS, 2012; JORDAN; MITCHELL, 2020). Then, systematic approaches are

adopted, such as spam classifiers, image recognizers, and medical diagnoses. The selected data assume a relationship to produce a prediction in response to a query (JORDAN; MITCHELL, 2020; TAULLI, 2020).

As a sub-area of ML, we find the technology called deep learning (DL). In this system, neural networks that imitate the human brain and process large amounts of data are used, deepening their learning (MUTHUKRISHNAN, 2020; TAULLI, 2020). The DL was established from the "exponential growth of data and greater computational capacity" (KAUFMAN, SANTAELLA, 2020, p. 4), being an advanced model with an optimized training time. The DL statistical model proved to be very productive concerning data structures, managing to process image recognition more effectively and identifying and recognizing speech, among many other aspects. According to Lecun, Bengio, and Hinton (2015), the highlight of the DL lies in the fact that the lessons learned by it do not come from humans but data analysis. Figure 1 shows how Artificial Intelligence, machine learning, and deep learning are related.

Figure 1 – Relationship among IA, ML and DL



Source: Muthukrishnan *et al.* (2020, p. 2)

The previous figure shows the macro context of machine performance, artificial intelligence, which aims to learn to reproduce human actions characterized by "intelligence" such as decision-making and reasoning. Machine learning is part of this field, with computational models developed based on prediction strategies through data analysis. Directly connected to the expansion of access to data, a sub-area of machine learning

emerges, called deep learning. The presence of countless hidden layers in the neural network enables identifying patterns that challenge the human being. An example of the use of DL in our daily lives is the automatic transcription of the spoken language, usually called Automatic Speech Recognition. Deep learning registers the most used words and the slang or acronyms that are part of our communicative repertoire.

Among the statistical models of language, the GPT-3, an algorithm that used DL, was developed by OpenAI, an American company founded in 2015, dedicated to research and development in Artificial Intelligence. The GPT-3 and its previous versions, GPT-1 and GPT-2 produce textual elements in response to a command. Contemplating its production, the GPT-3 does not understand as a human mind, even though it functions with commands given and taught through the imitation of human intelligence. GPT-2, the predecessor of GPT-3, has a storage capacity of 1.5 billion parameters and can predict words from an initial command. The GPT-3 is larger than the GPT-2, having 175 billion parameters. To have a more precise notion of the dimension of this algorithm, the data from Wikipedia, which comprises about 6 million articles, represents only 0.06% of the trained data by the GPT-3. The textual elements created by the system include books rewritten from the introduction of their author, conversations with fictitious personalities or not, alive, or not, based on the learning carried out by the program (VINCENT, 2020). With a database up to 100 times larger than its predecessors, we can consider countless possibilities for language, machine learning, and how they relate.

It is noteworthy that, as explained by Ferrari (2008), the computer understands the language passed by the human being when performed through the common language of the computer with the machine. Thus, the GPT-3 cannot create or express subjective opinions of the world as a human being since human subjectivity goes beyond the algorithm's learning. What the program does is produce content based on its syntactic rather than semantic sense. Even if texts, dialogues, or book chapters follow standardized grammatical rules, the algorithm will not have a subjective interpretation. Benzon (2020) explained that machines learn our language only in the way we pass it on to them, which means that, as far as the millions of meanings our language has, the GPT-3 responds and produces only the text as far as the signifier. According to Lecun (2018 apud KAUFMAN; SANTAELLA, 2020, p. 3), these systems "cannot understand the functioning of the world from observation (concepts such as three-dimensionality, movement, and permanence of objects, gravity, inertia, and rigidity among others)." Therefore, it is explicit that it does not understand the text, although it produces texts.

Although it is common to think of computers, or even the GPT-3, as a superintelligence machine (BENZON, 2020; FERRARI, 2008), it must be considered that its knowledge comes from the records of its programmer. The fact highlighted by Benzon (2020) when stating that the production generated by the tool is only a representation of the interaction between the human being and the world. In other words, all the meaning attributed to the GPT-3 productions is the meaning given by the reader. It does not mean that GPT-3 will not change the way we think about languages and technologies. When we talk about the GPT-3 and all its potential, we are considering, as exemplified by Vincent (2020), new possibilities for writing, for the creative field, time optimizations, and countless resources in constant expansion – an impact observed in the production of academic papers.

Contemporary academic writing

We understand that producing academic papers is a process full of anxiety, anguish, and stress, both for students writing in a second language and those writing in their mother tongue (CASANAVE, 2019; RUSSEL-PINSON; HARRIS, 2019). In addition, the writing process can be enhanced by work demands, family conflicts, pending readings, lack of immersion in the subject, and delayed bureaucratic issues.

The points mentioned above are similar to the stress-causing factors listed by Russell-Pinson and Harris (2019), such as perfectionism, conflict of priorities, lack of time, anxiety, challenges in the relationship with the advisor, and self-sabotage through negative cognitive habits, and personal issues. These aspects influence the posture adopted by the student throughout the writing, which can lead to the development of the imposter phenomenon (HUTCHINS, 2015). For the authors, some interventions can be decisive to alleviate these factors: recognizing signs of stress and weariness, developing support groups, adequate guidance for each stage of academic writing, psychological or therapeutic follow-up.

Students and advisors need to think about what to expect of academic writing. Issues such as grammar review, consistent paragraph structure, relevant reasoning to the topic addressed, and theoretical-methodological adequacy are part of scientific rigor. Therefore, the production must be developed with cohesion and coherence, whether in the field of the text itself or of the concepts discussed. The concern with these factors does not refer, at least, only to an academic preciousity since the scientific value needs a connection between periods, paragraphs, and sections.

Therefore, the linguistic proficiency in the language that the researcher is disserting interferes with the writing process and results, on the other hand, in effort and lack of confidence in writing using a second language. However, Casanave (2019) states that even academics whose mastery of the mother tongue is sufficient are concerned with formal aspects of language and proficiency in the face of the demands of academic production. The author adds that, as a thesis is the most relevant writing in a student's academic life, it impacts their reputation and advisor. Students' high and unrealistic expectations about the level of writing of a thesis generate anxiety and impair the quality of research and may even interfere with the possible contribution to the academic community and society.

Academic writing, with emphasis on works in the human sciences, involves authorship. Thinking about this aspect demands awareness of the writer's engagement in intellectual creation, which requires positioning instead of imposing supposed neutrality. In addition, authorship is related to the demarcation of the writer's identity in the production and the concern with the delivery of an unpublished work, free from plagiarism problems.

Achieving expertise for writing an academic paper requires years of dedication and effort. In Casanave's view (2019), years of study in a doctorate, for example, hardly guarantee that all researchers achieve this goal. The author draws attention to the meaning of this expertise, not limited to the domain of content about linguistic and textual rules or research methods, but also the performance of expertise not yet incorporated. Thompson (2012) corroborates the need for the researcher to present authorship and positioning throughout the writing and demonstrating a performance that convinces the academic environment that is not neutral.

Increasingly salient social factors have crossed the writing of academic papers at the undergraduate and graduate levels. As universities are gradually expanding the access of diverse groups, professional, family, and educational conflicts that directly impact the quality of writing have been enhanced (MADDEN, 2016). We do not want to say that these same conflicts were not previously faced. However, it is worth mentioning that, nowadays, these issues are intensifying since the level of access to consumer goods and survival among social classes is still permeated by abysses.

All these factors have impacted the production of academic writing. In addition, due to the growing dissemination of neoliberal ideologies, in which investments in human sciences tend to decrease, students have experienced difficulties, such as the decrease in the offer of scholarships in graduate programs and the impossibility of taking leave or reducing the workload of activities professionals for the fulfillment of academic credits.

The authors mentioned in this section recommend that contemporary academic writing develops in writing support groups, carrying out group reviews, non-evaluative feedback, formal and informal mentoring by mentors, and emotional support. Such activities work as an extension of the orientation and enhance the researcher's authorship development.

Trying to establish a counterpoint to these guidelines, we present, in the next section, a discussion about creativity in contemporary discourse, in times of ubiquitous communication, an aspect that the GPT-3 algorithm can destabilize, especially when it comes to the classic idea of textual production.

Creativity in contemporary discourse in times of ubiquitous communication

In a ubiquitous scenario, most interactions and experiences have primarily taken place in digital media, constructing senses and identities with multimodal resources and collective and transformative processes. These possibilities of self-expression can happen imaginatively and creatively in more formal processes and materialized, mainly in remix practices (fan fiction, musical mash-up, machinima, etc.) and in contexts of study, work, and entertainment (BURWELL, 2013; KNOBEL, 2015).

Creativity can be understood as a crucial skill to compose the transformative force of economic logic, which comes to light, especially in the challenging scenario attributed to the constant and impactful changes brought about by digital technologies (FLORIDA, 2012). Given this scenario, Burwell (2013) and Knobel (2015) point to the transition from the concept of creativity, initially focused on individual and solitary creation, to a conceptualization of creativity as a social, collective production that promotes the construction of senses.

Neves-Pereira (2018) explains the trajectory of the concepts of creativity in contemporary times based on what he calls "conceptual positioning," despite the lack of uniformity regarding the interpretation of this phenomenon. For the author, it is essential to promote dialogue about the different conceptual positions to enable creativity in scientific research, in addition to defending that "[studying] creativity is crucial but being creative in science seems to be a proposal of greater relevance" (NEVES-PEREIRA, 2018, p. 5). Four conceptual positions are striking in this discussion and encompass elements related to innovation, the system, and a socio-historical and psycho-social-cultural character.

The first of these is the so-called standard conceptual position by Stein (1953), for whom creativity is a process in which an individual creates something valuable and

innovative. Although the acceptance of this concept – even serving as a basis for Torrance's tests (1996) that measure characteristics of creative thinking, and for other lines of research on creative personality, creative process, and creative product – the differences regarding perspectives of the aspects of usefulness and novelty in investigations.

With this, a second conceptual position emerges, the systemic position of Csikszentmihalyi (2014), whose understanding of creativity is transferred from the act of individual creation, seen more as a mental phenomenon to a process permeated by meanings of cultural and social aspects. The idea, according to Neves-Pereira (2018, p. 7), is that creativity comes from the judgment and acceptance of certain groups of individuals rather than a "product of singular individuals, in individual actions [...] It always will generate changes in all instances involved [...] the subject, its social nucleus, and its cultural niche".

The third socio-historical conceptual position of creativity is on the contributions of Vygotsky (1990) to Psychology, whose approach modifies the ways of understanding the processes of human development and learning. Human development is redefined from an "internal evolutionary process to a socio-historical process" (VYGOTSKY, 1990, p. 8), changing the conception of creativity as a human phenomenon. In this position, there is a model called Creative Imagination, derived from Vygotsky's studies on creativity, not identifying, however, an official concept. This model does not highlight issues of utility or originality, understanding, in turn, the phenomenon of creativity as part of complex intrinsic processes to other human psychological functions.

The fourth and last position addressed by Neves-Pereira (2018) is based on Vygotsky (1990) but presents an objective definition of creativity. Glaveanu's (2010) sociocultural conceptual position understands creativity as a psychosocial-cultural process, which takes place in an intersubjective space and through dialogical social interactions, attempting to understand how the transformations of symbolic cultural elements into new and original ones occur, that is, creative products. Concerned with these transformations that occurred in the scenario of the Information Society for the Post-Information Society, Glaveanu *et al.* (2019) elaborate a manifesto as a response to the accelerated pace of the presence of various forms of artificial intelligence, pointing to creativity as a necessary aspect for the dignity and survival of the human species. The authors reaffirm the vision of creativity as a sociocultural phenomenon. Mind and culture are intrinsic and continuously shape each other, and that contributions from new studies on the subject directly impact organizations and schools.

Reflecting on writing in the academic context, we visualize attempts to motivate individual, creative, and argumentative writing. However, writing with analog technologies,

which the student hardly identifies themselves, no longer represents them. If the scene of digital cultures offers freedom and multiple ways of expression via images, sounds, videos, and even without restricting their construction of individual and community meaning, adolescents and young people are encouraged to express their representative views of the world, using their identities in ubiquitous communication scenarios with mobile devices connected to the internet, anytime and anywhere.

Therefore, writing in digital media is outlined as a creative process in a collective and transformative way. Burwell (2013) highlights the relevance of educating adolescents and young people to think critically about the power of the media, recognizing the pedagogical potential of practices. In this discussion, she agrees that young people's identities and their worldviews are increasingly being shaped through digital texts and interactions, emphasizing the introduction of conversations about representation, appropriation, creativity, and intellectual property in the classroom environment.

Thinking about contemporary scenarios and creativity in textual production, we present, in the next section, some discussions about copyright and intellectual property. These two themes have strong appeal in the legal field to guarantee the recognition of authors and inventors of different artifacts in society, covering the artistic, literary, industrial, and scientific domains in general. Our focus, however, is on the discussion about authorship/creation in times when discourses on destabilized creativity.

Copyright and intellectual property: a restricted look at the law?

In article 27 of The Universal Declaration of Human Rights (UN, 1948), everyone has the right to enjoy cultural productions and have the moral and material interests of their authorship safeguarded. Although this reference is not normative, it highlights intellectual property issues, specifically concerning copyright.

In the Brazilian context, we have two laws that regulate intellectual property: No. 9,279 (BRASIL, 1996), which regulates rights and duties concerning industrial property, covering the granting of patents, registration of trademarks, and recognition of inventions; and No. 9,610 (BRASIL, 1998), which legislates on copyright, involving artistic and literary production and other works of creation of the spirit. These works connect to the intellect and, in many cases, are not related to the appreciation of the author's subjectivity.

This section observes that the foundation of writing in contemporary times stands on two main points: a discussion of copyright beyond the law and what text production is by

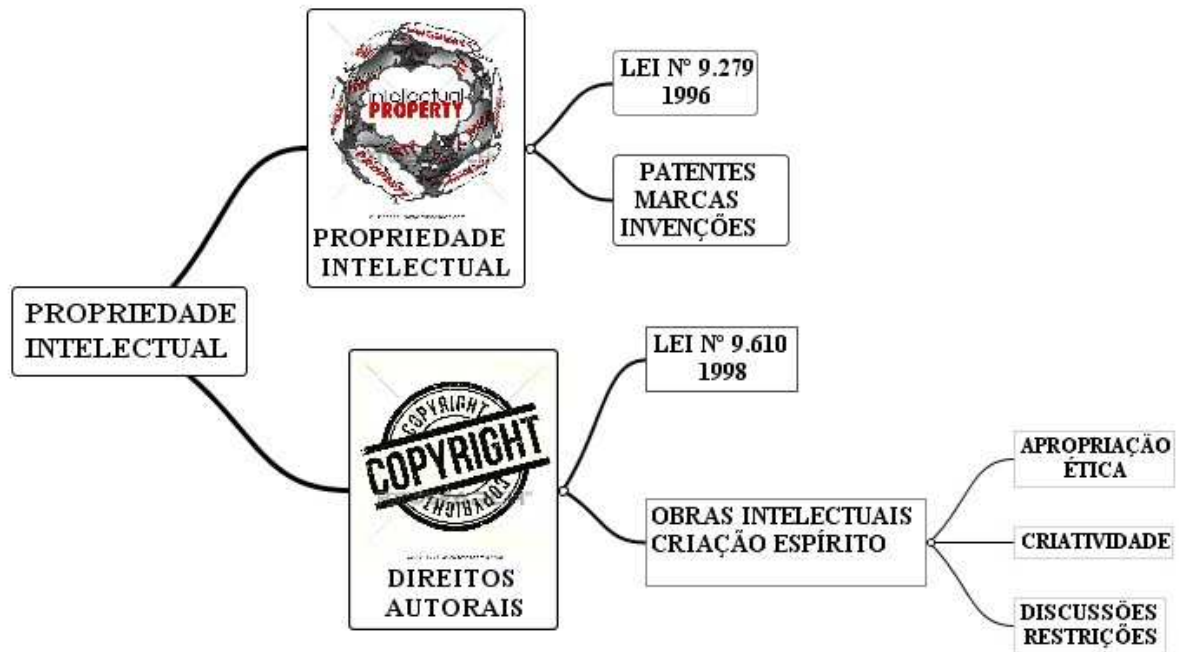
understanding. Given the possibilities digital platforms and devices offer, such as the GPT-3, writing as a multimodal phenomenon. Therefore, thinking about textual production only in the typographic domain means neglecting that sound, visual and tactile aspects, for example, impact reading, writing, and the construction of meanings. From this perspective, we think that the enthusiasm of digital environments brings the need to rethink what we understand by intellectual property, as the belonging of texts goes beyond the legal domain. In this text, we point out a problematization of the notion of authorship from the dialogue between the norms presented in Brazilian legislation and discussions in education and language that give new meaning to the concepts of authorship.

If we consider the Brazilian Copyright Regulation, in its article 11, the author is the one who creates literary, artistic, and scientific works. This definition primarily directs to an individual production process, an aspect that differs from that pointed out by Jenkins (2009), in which contemporary textual production is based on participatory culture. Authorship thought based on participatory culture tends to think that all creations are inspired by something and that the character does not necessarily fall into something non-existent but into the undertaking of a new look. In this sense, according to Burwell (2013), textual production is based on aspects of representation, appropriation, creativity, and intellectual property.

Contemporary academic writing, mainly mediated by post-structuralist bases, needs to consider the concept of ethical appropriation, which demands that authorship is not seen only as a process based on laws. We understand ethical appropriation as recognizing that every creation process starts from a specific context, is anchored in other productions, and recognizes the references used. Given the technological possibilities of contemporaneity, Burwell (2013) defends the existence of spaces for discussing digital texts and practices in education. We also think that contemporary education demands thinking about the relationship, in many cases, between digital and non-digital texts.

We illustrate, below, a broad notion about intellectual property, understood not only as an aspect restricted to laws. We present intellectual property based on what is in the legislation. In addition, however, we broaden the discussion as we analyze this concept from the perspective of education and language through post-structuralist views. In this way, in the figure below, we point out ethical appropriation and creativity as relevant elements in the discussion about the belonging of texts produced today.

Figure 2 – Intellectual Property Map



Source: Authors' elaboration

Following a broad perspective on intellectual property, as shown in the image above, Boa Sorte (2018) points out that the notion of written expression restricted to the production of typographic texts is questionable. Since considering a multimodal line, the concepts of writing and text have been expanded, both in the product itself and in the meanings, we construct (COPE; KALANTZIS, 2000). Furthermore, reading can also be understood as co-authorship while being recognized as constructing meanings (SOUZA, 2018). The texts, therefore, are seen as unfinished products and susceptible to different interpretations, thus resulting in different texts for each context and reader-coauthor. In addition, varied supports, such as audio and video devices, start to enable textual production, problematizing the idea that a text results only from writing on paper or in typographic editing programs.

In this direction, the creation of remixes is increasingly becoming influential in textual production. Moreover, remixing practices have become salient aspects in times of digital cultures, as they came to be seen beyond the realm of entertainment. In brief, remixes are texts produced collaboratively through copying, combining, manipulating, or transforming content to enhance their creators' identities and social practices (BURWELL, 2013). Although we point out the practices of remixes as significant for the educational field, we do not defend the undertaking of contemplative gazes; such practices intend a critical direction, which represents thinking about the ethical impacts of these creations on society. In this sense,

considering Janks (2010; 2014) and Burwell (2013), the texts need to be seen through the prism of critical analysis, which pays attention to authorship, creativity, power, and social justice.

Ethics, GPT-3 algorithm, and academic writing: where are we going?

This technology is already real. Our uses of technologies constantly modify the language. Although the model needs improvement, as Vincent explains (2020), what makes the GPT-3 a differentiated technology is its ability to manage billions of data as well as its formulation of responses, producing texts on its own once the system has learned and advanced further than its previous versions. Production of Academic writings can propagate knowledge to more and more researchers, students, teachers, and laypeople in certain areas.

One must consider whom the technology will serve. In tests carried out (VINCENT, 2020) with the GPT-3, he produced a series of racist and sexist tweets, mirroring those in the networks. As Brown et al. (2020) explained, it is impossible to affirm that technology created such opinions but reproduced them from the data analyzed in its training.

Considering all the changes with AI through time, more and more machines have improved and taught a little more about us and our way of seeing the world. Just as language is dynamic and remodels itself over the years, so does technology. In the presence of the GPT-3, there are infinite possibilities for teaching and learning, for scientific, literary, fictional productions, for primary and higher education, public and private. This is a reality. The trend is for the GPT-3 algorithm to be improved and developed, learning, expanding its potential, and offering an advanced version of what is already possible to visualize and use.

The discussions presented in this article permeate two latent conflicts: the considerations are preliminary, but, at the same time, they relate to the ephemeral character of studies in the field of technologies. On the other hand, since access to the GPT-3 is limited to system developers, data management specialists, and researchers, we propose an attempt to reflect beforehand on the impacts this algorithmic model can have on academic writing when released to all users. Our intention, therefore, is not to point out steps to be followed by professors, specialists in academic writing, or enthusiasts in the field of artificial intelligence. Instead, we propose to think about the impacts that can occur from the use of this algorithm in times when authorship becomes a phenomenon in constant destabilization and restructuring.

We discussed themes that seemed relevant to the problematization of contemporary academic writing throughout the text, including creativity, ethics, and intellectual property. In

our conception, the GPT-3 algorithm can present dilemmas that make us think about what we mean by authorship. On the other hand, this consideration does not aim to analyze authorship only from canonical directions. As the impacts of digital cultures have crossed production in academia, we consider the relevance of thinking about the impacts of algorithmic models of written production in the senses we currently build on authorship, creativity, and ethics.

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