Epistemic Colonization in the Brazilian Scientific Curriculum

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Article Info	Abstract
	The curriculum is characterized as an official document consisting of a space in which there are political, ideological, and cultural disputes. In addition, its existence configures the importance of making choices about what will be taught by teachers. In this way, such choices are characterized by political and ideological elements, since determining what is taught is, at the same time, defining the type of society that one wants to build. In this sense, this paper presents an investigative study on decolonization as an epistemological level that is manifested in the Brazilian curriculum, highlighting the normative document for high school. Thus, based on the fact that Brazil is a historically colonized country we have a hypothesis studied that there are elements in the Brazilian curriculum that contribute to colonizing at the knowledge level. In order to identify such elements with documentary research, we used the Discursive Analysis (DA) and Critical Discursive Analysis (CDA) to show which socio-cultural and power elements manifest the epistemic colonization in the curriculum. As initial results, aspects of the discourse of the curriculum are presented, materialized in the form of rule and pedagogical orientation, which corroborate with theoretical aspects about epistemic colonization.

Introduction

The educational process is characterized by exercising in the educating subject a transformation through the set of beliefs, values and knowledge that are transposed and constructed. In this way, the academically generated knowledge – or also said scientifically – undergoes transformations until it reaches the student. Such transformations carry cultural aspects and these, in turn, sediment patterns and behaviors in a social group. Thus, investigating the forms of culture that are embedded in the process of transposing knowledge to the educational activity is characterized by a relevant and, importantly, movement in order to understand the patterns, beliefs, and behaviors inserted in education. In this context, the decolonial theory is inserted, which according to Quijano (1992b, 2019) and Mignolo and Walsh (2018) is characterized by the resistance movement of the oppressed over oppressors, exploited over exploiters with regard to economic aspects, social and, mainly, psychological.

Thus, the educational process is one of those responsible for transmitting colonizing values, such as representative elements of one society over another, such as living standards, standards of beauty, and health, in addition to knowledge generated and inserted in a diverse culture. Thus, the present article fits into the

mentioned context and aims to present a decolonial study carried out on the Brazilian curriculum, highlighting the proposed concept of epistemic colonization. For that, we used the curriculum published by the State of São Paulo in 2020 to obtain data, together with the help of the theoretical-methodological contributions of Discourse Analysis (DA) and Critical Discourse Analysis (CDA) for its interpretation.

Theoretical Frame

Decolonizing Theory and Education

Coloniality as Concept: a Historical View

Education is one of the most relevant structures when we think about human formation. To make such an assertion means, among other aspects, to consider education as a set of action schemes and resources under which human values, beliefs and behaviors are shaped and directed towards a specific purpose (Sewell, 2005; Benedict, 2013; Boas, 2004). For this reason, education is understood as the process of modeling individuals in a specific social group. Thus, considering the word modeling does not mean that individuals submitted to that educational process will be manipulated and/or directed to a second process, known as indoctrination. Furthermore, this can also happen, given that the main ally of despotic governments is the ideas and doctrinal configurations through the educational process. This context fits what we define by *epistemological colonization*, or in its most particular form, *epistemic colonization*. However, before substantially defining what we understand by the concept mentioned above, we must resort to the historical process to understand where it arises and why it is important to us for the present discussion.

Furthermore, western education has gone through numerous transformations in terms of the way in which the constituent subjects of society were formed. In Antiquity, education had a specific purpose and specific characteristics in each social grouping, highlighting here the Greeks and Romans. According to Jaeger (2018) Greek education has in its initial genetics the heroic meaning of Homeric formation, a meaning that directed young Greeks - mainly Spartans - towards the purpose of the struggle, the defense of the group and the achievement of Homeric glory also understood as a virtue, the so-called *areté*.

The concept of *areté* is understood by the virtues inherent to a given individual. In addition, after the notion of Paideia (ideal of Greek formation), the principle of formation based on virtues stands out, always associated with the epic highlights narrated by Homer in the works *Iliad* and *Odyssey*. Thus, the Greek ideal of human formation, even in the Homeric period, develops into a Paideia, bringing together all the essential aspects of the community destined for the shaping of the subject according to established rules and beliefs. Finally, it should be noted that Greek education was aimed at the nobility and not for everyone, as a universalized principle. This notion of the universalization of education emerged only in the 18th century with the Prussian empire.

Also, every Greek man from the Homeric period (20th century bC to 13th bC) had the purpose of developing his military skills in order to defend his group, since in the period mentioned the said city-states or polis were still in training (Sacks, 2005). Thus, the Greek ideal of formation, initially, developed around militarization together with the cult of thought. For this reason, moreover, we attribute to them the emergence of Philosophy and

Natural Sciences.

However, the evolution of the Greek group towards the constitution of the so-called *polis*, or city-States, took place through social stratification and the separation of individuals according to established socio-cultural criteria, in addition to the economic evolution combined with the production of material and food goods. In this sense, talking about stratification in a social group means emphasizing the differentiation of individuals belonging to the same group, but with very different functions and access to resources.

So, already in the classical Greek period - a period when the Greeks reached their cultural and intellectual heyday - society was divided into slaves and free men. The former had the sole function of taking care of the production and supply of the city, while the latter exercised politics and intellectuality. As Braun (2008) points out about the Greeks in Egypt, not every free man had the resources to develop as a Greek citizen. Since being a citizen, in the case of Athens, it was the same as having resources and slaves to engage in social problems and discussions.

At this point we see in the history of humanity one of the first essential aspects that favors the development of the concept of *epistemic colonization*: democracy itself understood as the government of all - in the etymological sense of the term - is developed with the unconditional support of slavery. Thus, taking a leap in historical evolution, as we move from the Middle Ages to the so-called Modern Age, we have the following characteristics, in general terms, known historically: (i) in the social field, the formation of absolutist kingdoms and social reorganization in some countries in Europe, (ii) in the economic field, the emergence of banks and the monetization of work is evident, giving rise to the main forms of credit and financing aimed at urban commerce, (iii) in the religious field the occurrence of a movement contrary to the impositions of the Roman Apostolic Catholic Church triggered by the translation of the Bible from latin into other languages (reformist movement), (iv) in the scientific field, the studies of Descartes, Galileo and Newton stand out, (v) in the geographical field we have the incursion of ships across the oceans, building a new vision of the world and appropriating extra-European regions and, finally, (vi) in the artistic field the Renaissance movement, so important for the revival of both thought and the arts in general.

The fact that we did not extend the discussion to the millenary period of the Middle Ages does not mean that there were no important events that deserve our attention, on the contrary, we can verify many historical pictures that would lead us to many understandings of modern and contemporary constructions, as highlighted by Étienne Gilson in his work *La filosofia nel Medioevo: dalle origini patristiche alla fine del XIV secolo*. However, due to space limitations, we chose to give greater emphasis to the historical aspects concerning the modern period, since this is the principle of the central object of the present paper.

Nevertheless, the characteristics of the aforementioned Modern Age are approximate generalizations of the number of events triggered in the passage from the 13th to the 14th century. However, even in the face of so many transformations in the European social corpus, we can still highlight an aspect that gave rise to the concept of epistemic colonization: the differentiation of social groups by income, accumulated capital, religion,

and also, by the idea of race.

In this sense, it was in the Modern Age that capital became the center of Europe's social and economic concerns. According to Quijano (1992a, 1992b, 2019), modern Europe only existed due to the development of forms of accumulation, organization, and maintenance of capital itself. Here, we are not just referring to financial capital - since in the period under consideration banks were still in development and expansion - but mercantile capital. Thus, with the appearance of the so-called Burgos in the low Middle Ages and the formation of urban centers - the so-called cities and towns - commerce became the main economic source for the accumulation of wealth and the provision of resources for military defenses.

Thus, for example, in Italy during this period the division of regions called duchies. Each of them was subjected to a landlord - a set of families - who held a monopoly on trade and financial resources concentrated in banks in the Renaissance period. In other countries, like France and Spain - still as an integrated kingdom of Leon and Castile - the so-called monarchical absolutism prevailed. It is noteworthy that in the absolutist kingdoms, political power differed from economic power, the first being concentrated in the figure of a king or queen, validated by the papal figure, and the second, concentrated in merchants and travelers, responsible for establishing trade with the East Indies and North Africa.

As previously mentioned, with regard to scientific knowledge, in the modern period, the studies of Descartes in Mathematics and Natural Philosophy (now understood as Physics), by Galileo Galilei on the cinematics of bodies and Astronomy, as well as from Isaac Newton's dynamics, which established itself as the only explanation of phenomena related to motion until the 20th century with the introduction of the relativistic principles proposed by Albert Einstein. Among all these areas of knowledge developed at the height of the Renaissance, we can highlight the invention of the telescope (initially proposed with Galileo's telescope), the astrolabe (from Kepler's studies) and cartography compared through the trips made by Christopher Columbus. Furthermore, the most significant fact for the development of what we call *Modern Science* was the transformation - we risk saying evolution! - from purely concrete to abstract thinking, and its association with empiricism. In this regard, we can emphasize that modern science was not born on the ground of generalizations of empirical observations, but on that concerning an analysis capable of abstraction, capable of detaching itself from common sense, sensitive qualities and immediate experience (Rossi, 2007, p.7).

Thus, the scientific thinking of the 14th and 15th centuries were the first responsible for the adventure of western globalization, since the improvement of ships and their increasing resistance to long journeys, as well as technological devices such as maps and astrolabes, allowed white Europeans to venture into unknown waters. Such trips were financed by the crowns, as well as by European bankers. Thus, according to Quijano (1992a, 1992b, 2019) and Mignolo and Walsh (2018) from the 14th century onwards, the economy of Central Europe was only possible thanks to expansionism into new worlds, unleashing a new wave of imperial formations not only in what it says respect to the geographical aspect, with large portions of areas to colonize but also in the economic aspect through the trafficking of people from Africa for enslavement and work as labor in the future colonies of America.

With the arrival of the Europeans, in 1492, in the region formerly known as *Abya Ayala*, the European expansionist movement began the colonization process. Then, subjugating the local culture found to the detriment of European culture, European whites encounter the Indians - true holders of the lands of Abya Ayala - and begin a process of ontological deconstruction through the mischaracterization of the indigenous subject, as well as their characteristics. beliefs, values, and behavior. They begin, then, by naming the New World of America - an homage to the Europeans who recorded the historical fact - and, later, to promote the extraction of resources as if nature were inexhaustible. However, the new lands were divided between the two great economic powers of the colonial period, with emphasis on Portugal and the then kingdom of León and Castile (Spain).

As it was a new world, there was a need to colonize it according to European precepts and Christian morality, a fact that had the Pope as a validating agent, as we can see in the Bula *Inter Caetera* of 1493 written by Alexandre VI, the famous Rodrigo Borgia. Papal power was the only one capable of dividing regions, giving possessions to kings, and granting validity to political processes. In this way, the division of the lands of the new world should pass through the papal sieve.

Once the new world was divided between the Spanish and Portuguese kingdoms, the colonization process took on different perspectives until the beginning of independence at the end of the 18th century. Thus, the countries that today are called Argentina, Uruguay, Chile, Peru, Colombia, Paraguay, Bolivia, Venezuela, Ecuador, Suriname, and French Guiana were colonized by the Spanish, while the current territory of Brazil was explored and occupied by the Portuguese.

Thus, the indigenous peoples occupying the American continent underwent a process of deterioration both in their culture and in their values and standards, some even reaching extinction, as is the case with the Incas, Mayans and Aztecs. By colonizing the new territory, the colonizers established a new way of accumulating capital and developing the European economy, which would be guided by a power structure, defined by Quijano (2019) and Mignolo and Walsh (2018) by a *colonial matrix of power*.

So, according to the same authors, there is no point in talking about modernity - as a historical period - without talking about coloniality. The latter is a neologism created by Quijano (1992a) from the term colonialism. Thus, when we speak of coloniality we refer to the power relations in which the categories of race, color and ethnicity are inherent and fundamental during the period of modernity. Thus, following Quijano (1992a, 2019), there would be no modernity without coloniality, the first being totally based on the ideas of race and ethnicity. In addition, we have to

> America was the land that gave birth, substance and form to the coloniality of power, its system of social classification based on the idea of race, of conquerors over conquered, and its structural base linked to modernity and Eurocentric capitalism (Walsh, 2018, p.16).

In this sense, from coloniality onwards, we have the process of deconstructing the identity of pre-Columbian peoples and, consequently, *colonization at the epistemic - ontological level*. For, colonization does not happen only through physical and military force, but also through interferences and overlaps between a dominant

culture and a dominated culture. So, by subjugating black Africans to forced labor, depriving them of their beliefs, values and behaviors, we have the erasure of what defines them as a historical subject, placing them at the single level of merchandise that can be easily exchanged or discarded. Thus, the coloniality/modernity dyad is the basis of what is defined as a subject in the new world from the end of the 15th century. At this point, still according to Quijano and Wallerstein (1992b) a new neologism arises: *Americanity*. Americanity was the culmination of a gigantic ideological shield to the modern world-system (Quijano and Wallerstein, 1992b, p.586) where from the stratification of the notion of race, the political-economic power is established and, thus, the beginning of the formation of a South American society by the Spanish and Portuguese, Central American by the Spanish, French and English and North American by the English and French.

Epistemic Colonization Concept

According to Abdi (2012), colonization does not only pass through the force or militarism of dominating nations over other dominated nations but also through the psychological aspects of the subjects who are subjected to such a process. Thus, if we consider that the objective of the educational process is to mold the subjects towards the set of beliefs and values of a given society, which influences the *ontological*, *epistemological* and *psychological* aspects, we can conclude that colonization is also practiced on the epistemological aspect, that is, the set of knowledge that is generated and transmitted in a generational way carries traits that can indicate aspects of a colonizing process.

An addition, we define *epistemic colonization* as the set of actions performed on the generation and transmission of knowledge that carries colonizing aspects of a group with greater power over a group of lesser power. Such colonizing aspects are here interpreted as *operators*, which define the actions of the dominating subjects over the dominated subjects or reflect only the actions exercised on the dominated subjects from the dominators. These operators can act in the speeches (written and/or spoken) and are categorized in (i) *cultural* and (ii) of *power*. The first refers to the set of actions mobilized through beliefs, values, and behaviors within a social group. Thus, for example, when in a given discourse it is explicit (or implicit) that a certain cultural pattern of behavior is the most correct, or most appropriate, we notice an *operationalization* of this discourse to direct a change in behavior. The second operator, of power, refers to the discursive mechanisms that reveal the relationships of domination and influence certain actions in the considered society.

It is worth noting that the aforementioned operators result from the understanding of the mechanism belonging to the process of epistemic colonization. Thus, as every discourse carries an *ideology* and is open to interpretation (Pêcheux, 2014, 2015), we can hypothesize that the former is a form of cultural operator. In addition, when considering the notion of operationalization, within a discourse, we make an attempt to visualize the mechanical-linguistic aspects that the human unconscious reflects in the language.

Decoloniality and Coloniality

As previously mentioned, coloniality is a neologism that originated from the concept of colonization, which

refers to the power relations in which the categories of race, color, and ethnicity are present (Quijano, 1992a). However, if for Mignolo and Walsh (2018) and Quijano (1992a, 2019) coloniality is what defines modernity, the movement against this process highlights the deconstruction of the mechanism through which the relationship between dominator/dominated, exploiter/exploited, and colonizer/colonized becomes necessary and urgent for individuals who are subjected to this system. In this way, this movement contrary to coloniality is defined as *decoloniality*.

Furthermore, the theory of decoloniality - in the literature also found by *decolonial* theory or *descolonization* - is under construction and epistemological solidification, a natural process for all knowledge that is germinating and seeking space in the scientific field. However, the terms decoloniality and descolonization have different meanings when we assume, primarily, the etymological aspect. The suffix *de-* is used to indicate the opposite, that which goes in the opposite direction to the noun that alludes to. In this case, when we allude to the word decoloniality, we refer to the movement contrary to the coloniality process. Since the latter is a neologism originating from the term colonization, especially proposed to indicate power relations involving the idea of race and ethnicity, the term decoloniality is also a neologism, therefore, referring to the deconstruction of these power relations.

As for the term descolonization, we see the suffix *des-*, which also indicates the movement contrary to action. Thus, the action of colonizing involves a relationship of strength between one group and another, the first being stronger and the second weaker. In addition, there is a relationship of domination in all structures, economic, political, and social of this group of greatest strength and, therefore, of greater power over the group of least strength. However, this term is always indicated in a historical and geographical sense, leading us to confusion about its use. Because, when we show that a particular country has been descolonized, we think, initially, of a process of demilitarization or of a relationship of strength and power that undid a larger country on that one.

In this sense, we advocate in this work for the use of the term decoloniality to indicate the movement opposite to the process of establishing power relations involving the concepts of race and ethnicity, suggested by Quijano (2019). In this way, we can understand decoloniality, too, as the movement of resistance of an exploited group over its exploiter. So, we can say that

> Decoloniality is not a static condition, an individual attribute, or a linear point of arrival or illumination. Instead, decoloniality seeks to make visible, open and advance radically different perspectives and positions that displace Western rationality as the only structure and possibility of existence, analysis and thinking (Walsh, 2018, p.17).

Thus, when interpreting decoloniality as a resistance movement, we are, in fact, questioning the so-called Western rationality about the interpretation of the history of mankind, as well as the resulting worldviews. In the specific case of Latin American peoples, we can see that such interpretations have been imposed since the colonial period and are still strongly present today. This fact, as mentioned, one of the objectives of the present work is to analyze the aspects of epistemic colonization in the Brazilian curricula of science education. Because, as the curriculum is an embryo document of didactic materials produced and distributed to public education

networks, as well as private ones in Brazil, the cultural operators manifested will be materialized in these materials. This means that the curriculum carries the cultural aspects inherent to a social group and, in addition, influences the epistemological construction of that society.

Furthermore, we can finally define the concept of epistemic decolonization. Thus, we understand by the concept referred to the set of actions, practices and procedures that give resistance to the epistemological colonizing movement. If epistemic colonization builds a set of patterns and meanings that seeks to establish a relationship of domination and exploitation over a group of lesser power through knowledge, epistemic decolonization operates contrary to this. Thus, when inserting, for example, the History of Africa in the curriculum of a country that had slave labor for more than three hundred years, like Brazil, as its base, it would be to differentiate the so-called Western rationality, showing that there are power relations between different groups, highlighting the issues of race and ethnicity. Thus, we can highlight that

> To subjugate people, willfully rob their resources, de-ontologize the main fabrics of their being, and eventually achieve the above-mentioned naturalness of the project which convinces the oppressed to voluntarily partake in the de-centering of their world, an organized mental de-patterning must take place, and beyond what is done to the indigenous people, the implementers of the project must also be psycho-culturally deconstructed (Abdi, 2012, p.3).

In this way, the colonization process can start by force, but what keeps it on a people are the ontological and psychological deconstructions of the dominator over the dominated, as well as the imposition of an epistemology of its own, as the only possible one, supporting the idea of truth and validity.

Brazilian Science Education Curriculum

One of the most important documents in the educational field is the curriculum. In it, we highlight all the content that should be taught, the points that can be treated and what elements could guide our pedagogical practice. In addition, it is through the curriculum that teaching resources for teaching and learning are developed, such as textbooks, teaching sequences, assessment sheets, and other materials.

Furthermore, a curriculum can be, according to Sacristán (1998), in two ways: (i) hidden curriculum and (ii) explicit curriculum. The first brings the set of contents necessary for learning considering choices that are not easily shown, that is, the main choices of a political character are implicit in the text of the curriculum. The second type of curriculum, explicitly, the political choices regarding the contents are presented in a visible and almost naturalized way in the text.

Thus, when dealing with a curriculum, we have to take into account that it presents political choices. Because, when a given content *is left out* of one curriculum grid at the expense of another, it was possibly made a choice to do so. Thus, for each curricular choice made, there will be a waiver. For this reason, we say that the curriculum is, metaphorically, a minefield, that is, for each choice of content made there will be some point in particular for debates and discussions.

Thus, the construction of a curriculum revolves around the following question: what should we teach our students? What content should be worked on in this or that school cycle? Why should we teach content X and not Y? Notably, we perceive a choice associated with the curricular field.

With regard to the Science Education curriculum in Brazil, we can highlight a historical evolution in its development, which is given by Krasilchik (1987) and discussed by Carvalho and Vannuchi (1996). Thus, according to the authors cited, the curriculum proposal for Brazilian Science Education had, initially, the incorporation of international aspects such as, for example, the North American PSSC developed in the 1960s' and the experimental wave from the 1970s' to the 1980s'. Table 1 shows the historical moments and their relationship with the curriculum evolution in the period from 1950 to 1990 according to Krasilchik (1984).

Table 1. Brazilian Science Education Curriculum in the Period 1950 - 1990 according to Krasilchik (1987)

Year	**1950 - 1960**	**1970**	**1980**	**1990**
Mundial context	Cold War	Energy and oil crisis	Environmental problems	Technological competition
Brazilian Context	Industrialization/democratization	Dictatorship		Redemocratization
Objectives of teaching in elementary and high school	Form Brazilian elite	To form a citizen "morally"	Prepare worker	Train citizen and worker
Influences on teaching	New school movement	Behaviorism / Pragmatism	Behaviorism / Cognitivism	Cognitivism
Objectives of the renewal of Science Education	Broadcast updated information	Experiencing the scientific method	Think logically and critically	Science, Technology and Society Movement
Vision of Science in the school curriculum	Neutral activity emphasizing products	Historical evolution emphasizing the process	Product of the economic and social context	
Dominant recommended methodology	Laboratory - practice	Laboratory plus research discussion	Games and simulations. Problem solving.	

Institutions that influenced curriculum change	Professional scientific associations and government institutions	Curriculum Projects and International Organizations	Science Centers and Universities	Professional, scientific organizations and Universities

From the 1990s onwards, with the technological wave and the insertion of electronic devices for the transmission of information, education begins its direction towards digitalization. Thus, devices such as classes recorded on cassette tapes and CDs with audio were incorporated as resources for curriculum development. Therefore, it was after the promulgation of the 1988 constitution, with the process of re-democratization, that Brazil began the construction of what we now call the Common National Curriculum Base (BNCC, acronym in Portuguese). This document is provided for in the Brazilian constitution and was an evolution of two other documents: The National Curriculum Parameters (PCN, acronym in Portuguese) and the National Curriculum Guidelines (DCN, acronym in Portuguese).

Thus, according to Galian (2014, p.651), the PCN's are one of the ways of expressing the role of the State in the search for cohesion and order, acting in order to achieve the uniformity of the national curriculum, by defining a minimum content to be transmitted in elementary school, which has been a recurring search in the history of public education policies in Brazil. Thus, such parameters are created to guide the curricula of Brazilian states and cities, since they would not be characterized as a national curriculum.

In the early years of the 21st century, with the change of government and intensive investments in the educational field, curriculum parameters evolved into curriculum guidelines, which were also extended to Brazilian higher education. With the end of the first decade of the 21st century, following the national education program, discussions started to establish a national curriculum basis, that is, the set of minimum contents that should be worked over the nine years of education as well as the three successive years of secondary education (secondary education). In addition to these minimum contents, the document provides for the insertion of regional knowledge inherent to each state that constitutes the Brazilian republic.

In this second decade of the 21st century, we find ourselves in a debate about the following points: (i) Do the contents that are taught at school ideologically form our students? (ii) What is the role of the teacher in the education of children and young people? (iii) Is it up to the State to cover all educational expenses in the country, or should we even privatize education? These questions arose after the right-wing wave that has been plaguing Latin America for the past five years. However, before criticizing the corrosive neoliberal thinking applied to education, it is up to us to assess and analyze the impacts of these ideas on the education of Brazilians.

With regard to Science Education, the current document (National Base) is organized into two key elements: (1) Skills and (2) Skills. Thus, each area of knowledge - no longer understood as a discipline - is divided into skills that students must develop throughout their training and stay at that expected educational level. In general, we can say that competencies are umbrellas under which the set of specific abilities of each area of knowledge are

placed. Thus, skills are the materialization of what each student must incorporate through the knowledge studied.

Since each State, or Brazilian region, has the autonomy to develop its own curriculum, the State of São Paulo was the first to publish its new curriculum, in 2020, based on the competencies and skills provided for in the National Base. Thus, as the State that concentrates the greatest wealth in Brazil - economic and financial - the development of a curricular document makes it evident that there is a concern on the part of the public authorities to maintain the revolving bases of the capitalist system through training. Figure 1 highlights the structure of the curriculum of the State of São Paulo, as well as its areas of knowledge and organization.
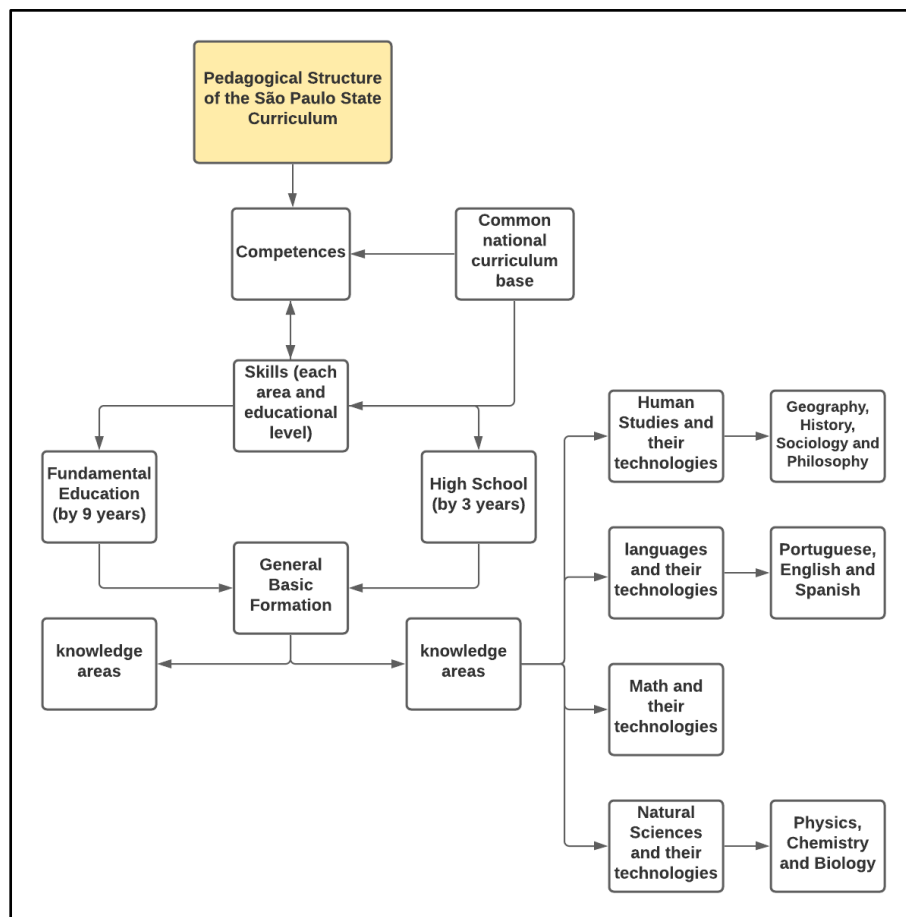
Figure 1. Schematic Organization of the Curriculum from the State of São Paulo, Brazil

In Figure 1, only the areas of knowledge related to secondary education (high school) are highlighted, which has a duration of three years. It should be noted that the curriculum of the State of São Paulo since it was the first to be published after the promulgation of the *Brazilian Common Curriculum Base*, brings aspects of extreme importance with regard to the new vision of educational formation that Brazil has been assuming in the second decade of the 21st century. In this way, it is characterized as an essential source to understand the discourse - implicit or explicit - of cultural aspects (values, beliefs and behaviors) that should be incorporated into postmodern Brazilian society.

Method

Methodological Approaches and Data Source

The present work aims to present a study about the epistemic colonization present in the Brazilian Science Teaching curriculum. To this end, some choices were made that comprise the methodological design of the research. Initially, it is worth mentioning that this study is an excerpt from doctoral research on decolonial theories and Science Teaching.

As the focus of the study, we chose to analyze only the curriculum of the State of São Paulo, for two reasons: (i) because it is the richest state in Brazil and, therefore, it encompasses aspects related to training and high levels of inequality in its economy. according to the Brazilian Institute of Geography and Statistics (IBGE, acronym in Portuguese) and (ii) because it was the first curriculum published after the promulgation of the Common Base National Curriculum and, thus, gives us the hypothesis that such curriculum has already incorporated all aspects concerning political, social and epistemological discussions about educational formation. Thus, the São Paulo State Curriculum is characterized as our first source of information for this article.

In addition, we chose to focus on the work in the area of curricular knowledge named by Natural Sciences and its Technologies, which according to the scheme shown in figure 1 comprises the following areas: Physics, Chemistry and Biology. Such choice is justified because our area of interest is the teaching of Physics, as well as its contributions to the educational formation of individuals, following the perspectives of Scientific and Technological Literacy necessary for intellectual development in the 21st century. Thus, the skills studied in this work are concentrated in the curricular sub-area of Physics.

With regard to the transformation of information into analysis data, we use two methodological perspectives. The first is characterized by the Discourse Analysis (DA) proposed by Pêcheux (2014, 2015) and the second verse on the Critical Discourse Analysis (CDA) proposed by Van Dijk (1984, 1998). Such methodological approaches were chosen because this is a document-based study, that is, the main source of obtaining information is documents. Thus, such documents carry speeches that, according to Pêcheux (2014, 2015), are permeated by ideological aspects that reflect the enunciator's thinking, or in this case, the group of individuals responsible for preparing the document.

Therefore, as our objective is to search for aspects inherent to epistemic colonization in the Physics curriculum, we propose the following elements as initial hypotheses: (i) the curriculum materialize cultural and ideological aspects in didactic materials, operating as a transforming agent in the educational process and (ii) the fact that there is no representativeness in physics teaching materials, such as scientists of any Brazilian or Latin genre in general in textbooks, is implicit evidence of the operationalization of epistemic colonization. In the face of such hypotheses, we need in addition to an in-depth discursive analysis of a guide about the critical construction on what is being interpreted, which could be obtained through the approach given by Van Dijk (1984, 1998).

Analysis and Interpretation

Regarding the analysis and subsequent interpretation of the data, we followed the steps proposed by Pêcheux (2014, 2015) about discursive analysis, combined with the propositions given by Van Dijk (1984, 1998) about discursive criticism and its ideological bases.

Initially, the discursive surfaces were listed for analysis. Such surfaces are, in this case, the specific competencies and skills of the discipline of Physics present in the studied curriculum. Subsequently, the discursive marks existing on the surfaces analyzed during the floating reading were identified. These marks are like doors to the discourse, that is, they are those words that call the most attention in the uttered speech. After the separation of the discursive marks, the discursive objects were evidenced, in a spiral process of coming and going in the reading. These objects have the function of promoting the forgetfulness of the enunciator of what he unconsciously wanted to say, but which in the enunciated speech was not said. In a fourth moment, the discursive formations were highlighted. Such formations are the most important during the analysis stage since it is characterized by the discursive matrix that keeps the true meanings of the discourse, that is, everything that the unconscious wanted to say and attributed as meaning is found in these discursive formations. For this reason, we say that the discursive process operates as a selection of ideological formations.

Furthermore, the discursive formations organize the ideological aspects of the discourse, giving us, after their identification, free access to the ideological sense attributed by the enunciator in his speech. Finally, with the last two elements evidenced, ideological formations are arrived at, that is, on the ideological basis of the evidenced discourse. Once the ideological formations are identified, we use critical analysis to construct an interpretation of the analyzed discourse. In this regard, however, it is worth noting that due to the risk of high subjectivity in the process, we resorted to other elements that contributed to the analysis, such as documents about the production of that speech, reports about the published curriculum, and political facts of the team that built it.

Results

The results obtained from the DA according to Pêcheux (2014, 2015) followed by the CDA according to Van Dijk (1984, 1998) are shown in tables 2 and 3 below. In the first, there are the discursive surfaces of the curriculum constitution process, considering only the discursive marks, discursive objects and discursive formations. In the second table, the analyzes related to ideological formations were corroborated with the CDA.

Table 2. Discursive Analysis of the Curriculum Parts

Discursive surface	Discursive marks	Discursive objects	Discursive process	Discursive formation

[1] The first volume of the São Paulo Curriculum - Child Education and Elementary School stage - was completed and approved on August 1, 2019. Available for the São Paulo education system, it presents the definitions that guide the (re)elaboration of the Pedagogical Proposal for these stages of Basic Education.	First volume was completed and approved presents the definitions that guide the (re)elaboration of the pedagogical proposal	Establishment of normative policies for the educational system.	To highlight the strength of a unidirectional policy in public education.	Educational documentation and its relationship with (political) institutional/structural power in the definitions of teaching.
[2] With the approval of the BNCC of High School, the States begin the (re)elaboration of their curricula. The Support Program for the Implementation of the Common National Curricular Base (Pro BNCC), established by ordinance No. 331, of 2018, establishes the guidelines, parameters and criteria for the implementation of the BNCC at the state and municipal levels.	approval States begin the (re) elaboration of their curricula establishes the guidelines, parameters and criteria for the implementation	Justification of the political structure for implementing its own regime. [based on that, we did that ...]	Justify the establishment of specific regional policies based on the current national structure.	Educational documentation and justification for its elaboration.
[3] The discussions for the elaboration of the São Paulo Curriculum for the High School stage started in 2018 and involved professionals from the São Paulo State Department of Education (SEDUC-SP), from the Union of Municipal Education Directors of the State of São Paulo (UNDIME- SP), the Union of Educational Establishments of the State of São Paulo (SIEEESP), the Economic Development	Discussions for the elaboration involved professionals Union of São Paulo Educational Institutions Economic Development Secretariat	Members who composed the formatting of the curriculum discourse.	Highlight the components that comprise the document, signaling the power of speech.	Members of the documentation and the justification of the power measured in the speech.

Secretariat, the Paula Souza Center, state universities (USP, UNESP and UNICAMP) and non-governmental entities, collaboration strengthened by the commitment of everyone involved in improving the quality of education.	state universities collaboration strengthened by the commitment of everyone involved in improving the quality			
[4] Thus, this second volume concludes the construction of the São Paulo Basic Education Curriculum, presenting the guidelines for the High School stage for each school in the state. In this process of improving the quality of education, the São Paulo Curriculum represents an important milestone for the reduction of educational inequalities in the State, since it explains the essential learning that all students must develop.	second volume concludes the construction of the São Paulo Basic Education Curriculum step-by-step guidelines for each school in the state process of improving the quality of education represents an important milestone	Explicit and implicit objectives of the elaboration of the new State curriculum	Emphasize the character of change, especially cultural, with the establishment of the new high school curriculum document.	Changing the curricular normative paradigm through the new document. Implementation of power relations.

[5] In order to guarantee the quality and specificities of the territory, the Education Secretariat, along with the Education Directorates, held 1,607 regional seminars, throughout 2019, to discuss the proposals for curricular flexibility for high school. In total, 142,076 students and 18,739 education professionals participated in these debates that brought inputs for the preliminary version of the curriculum. The seminars were attended by students from the 8th and 9th years of elementary school and the three grades of high school, from municipal, private and state schools.	Aiming to guarantee the quality and specificities of the territory. 1,607 regional seminars debate the proposals for curricular flexibility for high school of these debates brought inputs for the preliminary version of the curriculum The seminars were attended by municipal, private and state networks	Citation of sources external to the drafting group and who made up the process.	Justify social participation through the data presented and who participated.	Elements that were part of the discussions and justify the democratic participation in the elaboration of the document.
[6] In addition, a questionnaire was applied, with the participation of 165,252 students from the state network, to map their desires in order to subsidize the construction of the curriculum.	In addition, it was applied State school students mapping your desires	Form of communication with the end of the network, that is, students.	Highlight the means by which students had a voice and were consulted for the elaboration process.	Highlight for the form of communication with students - questionnaire - and construction of a map of "desires".

[7] In parallel, the team of editors was defined, formed by specialists who, in weekly meetings, throughout 2019, wrote the curricular document. This team was composed of 2 state coordinators, 1 coordinator of the council, 1 coordinator of stage, 1 coordinator between stages, 4 coordinators of propaedeutic areas, 1 articulator of propaedeutic itineraries, 1 articulator of Technical and Professional Education itineraries and 18 writers divided between the 4 areas of knowledge.	In parallel the team was defined experts did the writing	Present the members who wrote the official document.	Highlight the team that wrote the document, emphasizing the area in which they belong and their origin.	Highlight for the team that was formed, with only managers.

Table 3. Critical Discursive Analysis of the Curriculum Parts

Discursive surface	Ideological formation	CDA
1	Centralization of educational policies and state regulation. [Evidenced by the discursive highlighted **guides**]	The marks evidenced by **guide** and **(re)elaboration e approved** highlight a metric **orientation for social power**. In this case, there is a centralization and, from it, the definitions of what will or will not be used in the educational system.
2	Autonomy of Brazilian states through the organized national structure.	The brands **begin (re)elaboration**, **establish, guidelines, "parameters"** and **"criteria"** make clear the vertical relationship of the power that operates in Brazilian education. Thus, after the definition of a national guideline, regional ones are elaborated.
3	The collective construction of a public document is the best way to achieve quality.	The use of the expressions **the discussions, elaboration, involved** and **collaboration strengthened by the commitment of all** highlight a power relationship determined by a specific group, as the discursive process points out. In this way, this

discursive surface makes it clear which are the essential social components for this structure and the power that the economic aspect exercises over the constitution of a public document.

4	The new additions to the document are better, as there is an alternative path with the change of government. Entrepreneurship and economic thinking should guide the state's educational formation.	In this discursive surface, it is evident the representativeness of the new group that assumes state power, starting in 2019. This fact collides with the publication of this document, which occurred in May 2020. In this sense, when using the discursive mark "process improvement of quality "the discourse enunciated references to something that it already had, but that did not meet the needs of the state, that is, it improves what is not good. But, behind all the improvement there is a criticism of the previous movement. However, the document prior to this was drafted during the administration of the same party, which since 1995 has remained in the power of the state. In this way, it is evident that the current government breaks with the ideological party guidelines to find a new paradigm of action. This fact contrasts with what happened during the 2018 campaign, in which the then governor allied himself with candidate Bolsonaro to win votes, leaving his party companion, Alkimin, aside. With its election, the PSDB dies and begins a new phase.
5	Democratic speech. With the participation of society and even students.	The power operator in this discursive surface is justified by the ideological formation evidenced, that is, by the use of a democratic discourse to verticalize a relation of power. Thus, when elements that indicate the participation of society are referenced, mainly with students, the responsible group justifies its standardization, claiming "we made consultations, there were questionnaires", therefore, nothing is being imposed. However, the use of the expression "preliminary" makes it clear that this is only a democratic discourse, which means that a comparison between the preliminary versions and the final one, as

		well as with the answers obtained by the questionnaires, may show us this assumption.
6	Democratic speech.	The operator that manifests itself here is the verticalization of the power relationship. For, when sending a pre-fixed questionnaire, it is determined what are the possibilities allowed and accepted within that structure. In a way, a frontier is already oriented where the subject may or may not walk. Asking the longing is the same as knowing what you are afraid about. Thus, at the same time that it is democratized giving way to speech, it is limited to pre-fixed questions.
7	Official documents must be written by management experts.	In this discursive surface, it is not only evident the verticalization of power relations, but also the concealment of these relations through the choice of who writes the document, considering only managing members.

Discussion

On the discursive surface [3] there is an essential point that is consistent with the decolonial perspective since according to Walsh and Mignolo (2018), the main aspect that contributes to the maintenance of ideological, political, epistemic, and ontological power [emphasis added] from one nation to another is exploitation, as well as the flow of wealth. As an explicit objective in the discursive surface [4], the improvement of education in the State of São Paulo is evidenced through the use of the discursive brand process to improve the quality of education. As an implicit objective, it is noted the establishment of norms that guide devices to be culturally incorporated in the educational legislation of the State, making the existing power relations be maintained. For, a document is built that "improves" something that until then was bad or inadequate. Here, the discourse employed is that of replacing it with better regulation, that is, cultural adequacy. The highlight of the speech at this point is, without a doubt, improvement.

São Paulo government in January 2018, where a new business group comes to power. This group, according to the 2018 electoral campaign, characterized the representativeness of political parties hitherto considered right-wing. With the internal split promoted by two of the candidates, one for governor and one for the presidency of the Republic, the first redirects the party's role in relation to national politics, which at the time was polarized. On the one hand, the supporters of the pockets ultra-conservatism and, on the other, the supporters of the weakened and defeated left after the 2016 impeachment and the media scandals involving public companies. Here, it is inevitable not to notice the political direction taken a year after the change of government. The motto

of the campaign for the candidate elected to the governor of the state of São Paulo as a manager, having already held the position in the city hall of the capital, São Paulo. In this sense, the ideological base that underlies the entire São Paulo curriculum is the economic one, which corroborates the current discourse that it is São Paulo that carries Brazil, that is, the nation's economic flagship. This point is historical, and it is worth a digression, especially when it comes to the colonial period and the pre-republic of Brazil.

On the discursive surface [6], it is essential to deal with state historical elements in order to understand the mechanism of the constitution of the document. Initially, the list of governors of the State of São Paula and the change in the directive of the state power with the 2018 elections. Subsequently, the speech of ex-president Fernando Henrique Cardoso, on February 7, 2021, about the lack of focus and direction of the base party in a Brazilian television program, says that it was broadcast by magazines and newspapers in Brazil. A few days later, the then governor-elect of São Paulo declared that the party did have a focus. Here again, the establishment of a new power relationship initiated by the *Dória* era [governor] is evident, a kind of *Bolsonarism* dressed up in a management model.

Finally, the ideological formation highlighted on the discursive surface [7] is, without a doubt, that of democratic discourse. Through the use of expressions to *guarantee the quality and specifics of the territory*, *debate the proposals*, *debates that brought inputs to the preliminary version and counted on the participation*, the recurrence to the democratic movement is noted, in order to justify the non-imposition of regulations in a vertical way. However, the preliminary discursive mark shows the interpretation that: yes, space was opened to the community, but not necessarily all the voices were heard. Thus, it would be essential to compare the different versions of the document, until the end, to know to what extent the opinions of society were incorporated. For, the democratic ideological discourse is superimposed on a populist power relationship that, in general, is centralizing.

Conclusion

In this work, we seek to present a study with a decolonial theme on the Brazilian curriculum, emphasizing the scientific curriculum of Physics and its constitution as a document. Thus, at first, we observed that the decolonial theory offers us a lens of thought based on the epistemological patterns constructed throughout history, especially when dealing with Western history. Thus, we define from the theoretical frameworks given by Abdi (2012), Quijano and Wallerstein (1992b), Quijano (1992a, 2019) and Mignolo and Walsh (2018) the concept of epistemic colonization.

From the definition of the concept of epistemic colonization, we built a research scenario assuming Brazil as a historical-cultural context of analysis with regard to the scientific standards taught in basic education. For this analysis, we take the curriculum as a source of information, since we start from the assumption that the teaching materials used in the various disciplines, whether in elementary or secondary education, are nothing more than the materialization of the explicit and interpreted curriculum. Therefore, we use the theoretical and methodological assumptions of Discourse Analysis given by Pêcheux (2014, 2015) and the Critical Discourse

Analysis proposed by Van Dijk (1984, 1998) to search for ideological and cultural elements in the discursive surfaces selected from the curricular text. In this way, we obtained not only the elements mentioned but also aspects related to the manifestation of power in this research, interpreted as an operator.

In a third moment, we could evidence that the text that presents the curricular construction of the State of São Paulo highlights, primarily, the economic factor as a motivating agent for its establishment and implementation, comparing with the decolonial theoretical aspects emphasized by Mignolo and Walsh (2018) and Quijano (1992b, 2019). In this way, as it is an excerpt from documentary research and still under construction, we rely on the definition of the concept of epistemic colonization in order to search, in the studied curriculum, elements that promote colonization of the students' thinking in what it concerns Science Teaching and, in particular, Physics Teaching. Finally, this paper sought to contribute to the understanding of the aspects of decolonial theory applied to education, as well as to develop new theoretical and methodological contributions for the pursuit of new studies and for the production of knowledge that is relevant to the scientific and educational area.

Recommendations

The present article has undergone some changes in the title and in the presentation of the results with regard to the version presented in the form of an abstract of the International Conference on Humanities, Social and Education Sciences. In this way, we updated the title giving focus to what is being discussed in the text, and for the sake of space for discussion, we present the analyzes carried out on the curricular speeches presented at the time of its publication.

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