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# Thought experiment: rhetoric and education<sup>1</sup>

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## Abstract

The thought experiment is an argumentative resource commonly used in the field of philosophy, but little present in educational research. This article aims to characterize this type of experiment as a rhetorical strategy capable of offering contributions to educational practices, particularly with regard to teacher formation aligned with humanizing pedagogical approaches. The article addresses the thought experiment in three dimensions: the experimental dimension, with the aim of arguing that there is no significant difference between thought experiments and usual experiments; the narrative dimension, highlighting its proximity to fiction literature; and the philosophical-educational dimension, with the purpose of showing its relevance in pedagogies that aim at the humanization of educational relationships, as proposed by John Dewey. The association of the thought experiment with Deweyan pedagogy favors the democratic way of life and values the liberation of imagination, subjectivity, and emotions, going against the mechanistic trend prevailing in education.

Keywords: Thought experiment. Humanist pedagogy. John Dewey. Teacher formation.

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## Experimento de pensamento: retórica e educação

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### Resumo

O experimento de pensamento é um recurso argumentativo comumente utilizado na área de filosofia, mas pouco presente em pesquisas educacionais. Este artigo visa a caracterizar esse tipo de experimento como estratégia retórica capaz de oferecer contribuições às práticas educativas, em particular no que diz respeito à formação de professores alinhados com abordagens pedagógicas humanizadoras. O artigo aborda o experimento de pensamento em três dimensões: a experimental, com o intuito de defender que não há

diferença significativa entre os experimentos de pensamento e os experimentos usuais; a dimensão narrativa, destacando a sua proximidade com a literatura de ficção; e a filosófico-educativa, com o propósito de mostrar a sua relevância em pedagogias que visam à humanização das relações educacionais, tal como propõe John Dewey. A associação do experimento de pensamento com a pedagogia deweyana favorece o modo de vida democrático e valoriza a liberação da imaginação, da subjetividade e das emoções, contrariando a tendência mecanicista vigente na educação.

Palavras-chave: Experimento de pensamento. Pedagogia humanista. John Dewey. Formação de professores.

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## Experimento de pensamiento: retórica y educación

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### Resumen

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El experimento de pensamiento es un recurso argumentativo comúnmente utilizado en el área de la filosofía, pero poco presente en la investigación educativa. Este artículo tiene como objetivo caracterizar este tipo de experimento como una estrategia retórica capaz de ofrecer contribuciones a las prácticas educativas, particularmente en lo que se refiere a la formación de profesores alineados con los enfoques pedagógicos humanizadores. El artículo aborda el experimento mental en tres dimensiones: experimental, con el objetivo de argumentar que no existe diferencia significativa entre los experimentos mentales y los experimentos usuales; la dimensión narrativa, destacando su proximidad a la literatura de ficción; y la dimensión filosófico-educativo, con el propósito de mostrar su relevancia en pedagogías orientadas a la humanización de las relaciones educativas, como lo propone John Dewey. La asociación del experimento de pensamiento con la pedagogía deweyana favorece el modo de vida democrático y valora la liberación de la imaginación, de la subjetividad y de las emociones, contradiciendo la tendencia mecanicista de la educación. Palabras clave: Experimento de pensamiento. Pedagogía humanista. John Dewey. Formación de profesores.

## Introduction

The philosophical value of rhetoric for education consists in promoting reflections on educational practices in the field of the preferable, a space that includes experiences dictated by the circumstances of the moment, being, therefore, insensitive to any attempt at planning with claims to accuracy (Cunha, 2004). In line with Aristotle, Porchat Pereira (2001) analyzes that rhetoric, like dialectics, is different from science precisely because it is not based on reasoning guided on what is necessary, but on what is contingent. Both make up the exercise shared by a community that debates in search of true knowledge in each area of knowledge.

Also based on Aristotle, Perelman and Olbrechts-Tyteca (2002) define rhetoric as the art of persuasion, which consists of using discourse with the purpose of mobilizing – intellectually and emotionally – an audience for action or, at least, creating the dispositions required by action. To achieve this goal, the rhetorical speaker employs several argumentative strategies, among which example and illustration stand out. The first consists of presenting a case and then formulating conclusions, while the second lends itself to giving life to an already established conclusion. While the example serves as a source for the theory, the illustration aims to make the argument more understandable through a potentially elucidative situation. Both can make use of true cases, but nothing prevents fictional narratives from being used to achieve the desired end.

Associated with the explanation of a theory, the *thought experiment* consists of a simulated situation created by a researcher or teacher, appointed *speaker* in the vocabulary of rhetoric, who presents it to readers or listeners, a *public*, according to the same lexicon. It is an imaginative endeavor that contains elements like those of fiction, structured like any narrative, with beginning, developing, and ending (Nersessian, 1992; Elgin, 2014).<sup>2</sup> The following sections of this article will seek to characterize this resource, proposing to position it as an argumentative strategy capable of offering an excellent contribution to educational practices, particularly when education is recognized as belonging to the field of the preferable. Whether as an example or an illustration, the thought experiment is a rhetorical exercise that can be useful for teaching any theoretical content, presenting unique potential in teacher education,

especially in courses that align with humanizing alternatives, outside the boundaries imposed by market and evaluative reasoning in force today (Cunha, 2015).

The thought experiment will be examined in three dimensions, initially focusing on its experimental character, to defend that this type of experiment is not essentially different from other types of research. Then, its narrative character will be examined, in proximity to fiction literature and, finally, its philosophical-educational character, whose potentiality applies to new pedagogical approaches, especially when students are involved in the process of its elaboration.

## The experimental character

4 As established by Cunha (2022, p. 75), it can currently be said that “[...] successful scientific activity should use both our imaginative capacity and our perception”. This premise is one of the pillars of support for the experimental character of the thought experiment, since its realization makes it possible to raise hypotheses through imagination and the perception of the created situation, leading to a conclusion about the object under examination.

The author thus expresses herself about the potentiality of thought experiments to “illuminate facts” through imagination:

[...] the imagination serves as a laboratory of the mind, a place where hypotheses can be created, elaborated, and tested. In addition, in scientific thought experiments, restrictions, even if tacit, are recognized, shared, and properly judged by the scientific community (Elgin, 2014, p. 227).

Unlike scientific experiments that use empirical data, thought experiments are developed in the laboratory of the mind, relying exclusively on the imaginative power of those who elaborate them and their peers, inviting “[...] their interlocutors to imagine certain situations that are different from what is usually seen in ordinary practice – extraordinary situations, but perfectly plausible” (Cunha, 2022, p. 76). Although this is so, its development relies on

predicted and controlled variables, so that the hypotheses created and tested can lead to a plausible truth about the world outside the mind.

The author also states:

Thought experiments are not essentially private; nor are they particularly mental. Thus, they combine the public and private spheres. Although they are imaginative exercises, they are publicly articulated, discussed, illustrated, and disputed (Elgin, 2014, p. 227).

Those who work in this line of investigation operate on the assumption that, as in empirical experiments, the occurrences of the mental laboratory have a well-established value and function, as they maintain contact with the public sphere, can generate non-dogmatic knowledge – as is desired in any area of science – and can lead the researcher to obtain “[...] knowledge or understanding of an empirical nature” (Cunha, 2022, p. 76).

As Elgin (2014) emphasizes, the differential of the experience that takes place in the mental laboratory is the possibility of raising hypotheses that perhaps could never be put to the test in practice. This type of experiment allows us to break the dualism – so common in the scientific sphere – between the mental and the empirical, as well as to provide the extension of the debate to non-specialists, for whom their procedures are easy to access and understand.

The narratives created by Rorty (1994) and Davidson (2001) reveal the value of thought experiments. In both cases, the authors use creatures that do not exist in the real world, but which, when they become real in the mental laboratory, give rise to hypotheses that enable the testing of theories about human psychology. In *Philosophy and the Mirror of Nature*, the Antipodes are beings like humans, but who do not recognize the existence of their own mind, a condition that evidences the dualism between mind and body, common in philosophy, and that allows Rorty (1994, p. 135) to conclude about the non-existence of our specular essence, our supposed “special mental ingredient”.

The Swamp Man invented by Davidson (2001, p. 444) is a replica of Davidson himself created by the action of lightning, with the following difference: the new Davidson seems to recognize the world, but “[...] cannot recognize anything, since he did not know anything in the first place”. The

purpose of this thought experiment is to discuss the hypothesis that “[...] what our words mean is fixed, *in part*, by the circumstances in which we learn and use them” (Davidson, 2001, p. 450, emphasis added). The Davidsonian parable aims to show the influence of public and social aspects on the human mind, regarding the attribution of meaning to the world, and to discuss the mind itself as a competent instance to construct meanings through experience and learning.

To those who dispute the validity of thought experiments, comparing them with the qualities of empirical experiments, the author says that the results of no experiment “speak for themselves”:

They require interpretation. Its interpretation draws contextual knowledge, beliefs about its instrumentation, experimental development, the course of events that constitute it and its effect. [...] Experiments are conducted; they do not happen by chance. They have a narrative structure. They are subject to interpretation and reinterpretation if the premises of the context change (Elgin, 2014, p. 225-226).

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Thus, although based exclusively on imagination, thought experiments are conducted, directed, and interpreted by the researcher. There is nothing that invalidates them in this regard when compared to other types of experiments. On the contrary, their characteristics bring them closer to science, as they open the way for discussion about the truths they reveal and, thus, provide relevant knowledge.

For Kuhn (2011), this type of experiment can reveal new information, which laboratory experiments also do, but its primary function is to lead the scientist to review their own expectations about materials that were already accessible. When using the conceptual apparatus that is familiar to him, the researcher is faced with a mismatch, a conflicting situation incites him to produce new concepts, as happens in the early days of a scientific revolution (Cunha, 2022). Depending on the changes in the context in which they are staged, the results of thought experiments are as provisional as those of any other modality of investigation. In addition, its plots can also be reproduced, imagining possible alternatives within the original scenario or through variables not previously included in the experimental layout, which allows the configuration of new hypotheses and the formulation of new solutions.

Finally, regarding rhetoric, it should be noted that both usual experiments and thought experiments have persuasive power. In the first modality, persuasion operates through quantified data expressed in graphs, tables, and other resources of this nature, through which the auditorium is led to visualize the efficiency of the procedures and the possible effectiveness of the results. In the second modality, persuasive power resides solely in the ability of the audience to act imaginatively; everyone who reads or listens to a thought experiment must be an active participant in the proposed situation, seeking within themselves the cognitive and affective elements that can enable their identification with the narrative created by the speaker.

As Kuhn (1996) analyzes, the persuasive effect in any area of science cannot be neglected, particularly at times when a new paradigm is approaching. At these times, although logic and experimentally obtained data are in question, it is essential to know the “[...] techniques of persuasive argumentation that are effective within the very special groups that constitute the community of scientists” (Kuhn, 1996, p. 128). Arguments developed with the aid of thought experiments, either as examples or as illustrations of a theory, do not dispense with data, nor do they aim to abolish logic; they only add imagination as a fundamental component of persuasion.

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## The narrative character

The narrative character of the thought experiment is concerned with its structuring. While empirical experiments use physical devices – microscopes, for example – thought experiments make use of words and symbolic resources to create imaginative exercises. According to the Author (2021b, p. 628), such exercises can employ “[...] dramatic resources in order to give life to the contents conveyed [...]”, such as narratives and fictitious characters that institute a new symbolic-imagistic world.

With support in the existing material reality, drama allows new possibilities of interpretation of life and the world to present themselves (Wagner, 1976). The imaginative feature of this type of experiment

[...] originates from the fact that, just like fictional works, they are not typically – and in no case need to be – representations of something real. But the unreality of the objects and subjects that ostensibly appear in them does not diminish their function [...] (Elgin, 2014, p. 227).

As in fiction literature, thought experiments allow the understanding of components, every day or not, that have a certain effect on the individual and the world. Elgin (2014, p. 222) argues that both thought experiments and fictional narratives and traditional experiments “[...] promote epistemological access to aspects of the real world [...]”, as they all provide the cognitive awakening of the reader, who has his mental activity triggered when he is provoked to observe the world from a new perspective.

Conjugated to the experimental, the narrative character of the thought experiment denies the dualism between public and private. As stated by Prestes and Tunes (2012, p. 330), “[...] every work of the imagination is always built from elements taken from reality and present in the person's previous experience”. Through fictional characters or stories, the mental exercise brings together imaginative elements that rely on the reader's experience and, at the same time, link them to the outside world. Literary works contain experiments of this kind, because, in certain passages, they transport those who read them to an unknown world, even when the scenario is apparently common, provoking the construction of hypotheses, tests and imaginary resolutions.

Swirski (2007) considers that, when literary fiction is placed on the same level as thought experiments, a dialectical relationship between narrative structures is proposed, not with the objective of unifying them, but with the purpose of conjugating elements that are undeniably distinct. Thought experiments perform a partial function within the narrative, which transmits them through its structure, without becoming the totality of the fictional work (Thought Experiments, 2023). Not every narrative can be considered a literary work because, in many cases, the intention of the text is only to present a sequence of facts to be contemplated and understood by the reader through access to aspects of the reality under examination. In these cases, we did not observe the presence of thought experiments, which were unnecessary for the proposed objective.



True literary works of art propose to reveal life, whether in the psychological and personal sphere, or in the historical sphere of humanity, not as if it were a march with a uniform and uninterrupted flow, but as a conglomerate of events, “[...] each with its plot, its beginning and movement to its end, each with its particular rhythmic movement, each with its unrepeatable quality, which permeates it entirely” (Dewey, 2010, p. 110). These works incite both objective contemplation and reflection, instituting hypotheses that lead the reader to make their own tests, simulations and also to elaborate personal resolutions. Thought experiments are not the core of the narrative, but they reveal the mind and the world that inhabits it – both that of the character and that of the readers.

This is what Clarice Lispector (2020) does in *A paixão segundo G. H.* (Passion according to G. H.), a novel that, in some excerpts, discusses the human condition and raises hypotheses about what distances the narrator from her humanity. Says the author:

But it's just that becoming human can become ideal and suffocate with additions... Being human should not be an ideal for the man who is fatally human, being human has to be the way I, a living thing, obeying for freedom the way of what is living, I am human. And I do not even have to take care of my soul, it will fatally take care of me, and I do not have to make myself a soul: I just must choose to live (Lispector, 2020, p. 101).

The issue at hand, the human condition, is analyzed through a reflection in which the narrator's mind sometimes becomes a laboratory *locus*. Her words are tools for constructing hypotheses that can be summarized as follows: the human being cannot be an ideal; the human being must be the way one lives. From these premises, it is established that the means to fulfill human purposes is the freedom from careless life, free from the limitations inherent in an idealized being.

The narrator concludes that “[...] humanity is soaked in humanization, as if it were necessary; and this false humanization prevents man and prevents his humanity” (Lispector, 2020, p. 128). In testing the feasible conditions for a free life and perceiving them, by his own existential experience, absent from the world, the reader is faced with the conclusion that the human ideal

is false and therefore an obstacle to the consummation of his humanity. This confrontation, which takes place exclusively in the realm of imagination, can motivate you to act, putting the author's hypothesis to the test, modifying the relationships you maintain with your peers, etc., even if you do so exclusively in the imaginative realm.

Present in literary works, thought experiments do not always claim to elucidate a theme within the narrative. As can be seen in this passage by Clarice Lispector, they are often nebulous, intentionally proposed to give opacity to the reader's mind, thus offering an invitation to reflection, to confront possibilities, hypotheses to be unveiled through personal investigations. This is what is observed in the chapter *A ópera* (The opera), by *Dom Casmurro* book, in which Machado de Assis (1997) presents an allegory composed of dramatic and mystical elements to propose a new perception of cosmogony.

Machado de Assis' hypothesis (1997, p. 13-14) is formalized as follows: "Life is an opera and a great opera. (...) God is the poet. The music is from Satan, [...]". It is so because the world arose from the attempted partnership between God and Satan, from what

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[...] resulted some disconcerts that the prior hearing and friendly collaboration would have avoided. Indeed, there are places where the verse goes to the right and the music to the left. There is no shortage of people who say that this is the beauty of the composition, escaping the monotony, and thus explain the triplet of Eden, the aria of Abel, the choirs of the guillotine and slavery. It is not uncommon for the same moves to reproduce themselves, without sufficient reason. Certain motifs tire by dint of repetition. There are also obscurities; the conductor abuses the choral masses, often covering up the meaning in a confused way. The orchestral parts are treated with great skill. Such is the opinion of impartialists (Assis, 1997, p. 14-15).

The allegory, which is the proposed thought experiment, aims to test the hypothesis that life is a great mismatch, which would prove the observation of the ills described in the narratives of the common man about worldly life. Clarified about the origin of the evils they witness, the anguished reader may ask how long this chaotic picture will persist, to which the Machadian narrator replies: the "[...] play [...] will last as long as the theater lasts, and it is not

possible to calculate how long it will be demolished for astronomical utility” (Assis, 1997, p. 15).

By refraining himself from offering a prediction about the length of life, Machado de Assis escapes the temptation to be exact and enters the terrain of possibility, of fallibility. His thought experiment leaves the reader with doubt and the desire to reflect on a plausible, non-dogmatic hypothesis, which he will do depending on how he wants and can use his own imagination. As in Clarice Lispector, the Machadian reader is led to an imaginative universe that, although instigated by the author of the work, assumes unique personal contours.

Through these truly artistic works, the public manages to have an aesthetic experience, as they are led to participate “[...] in a movement of anticipation and accumulation, a movement that finally concludes [...]” with the completion of the reflections made; there is no need to obtain an answer or a solution, because “[...] the consummation of a movement [...]” was carried out, having the mind as a space and, as a structure, the narrative (Dewey, 2010, p. 113). The cases of Machado de Assis and Clarice Lispector reveal that the thought experiment in literary works constitutes a powerful rhetorical strategy because it mobilizes intellectual and emotional components of the audience, being able to create dispositions for action.

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## The philosophical-educational character

The thought experiment has a philosophical-educational character because it institutes reflection, by encouraging the search for knowledge, a process in which the mind is established as a fruitful *locus* for experimentation. This investigative conduct in search of the truth, with the purpose of altering the intellectual and affective dispositions of the audience, is composed of elements like the tradition of the first teachers of Classical Greece, the sophists, who proposed to their students the intervention, participation, and transformation of reality.

The sophist tradition assumes “[...] the belief that there is no area of human life, or of the world as a whole, that is immune to the understanding achieved through rational debate” (Cunha, 2015, p. 70). Sophistics maintains

that education is only done through reflection that enables the learner to understand the world, as well as their participation in it, and this happens by exposing individual ideas and hypotheses in the collective sphere, so that not only the sharing of narratives, but also the obtaining of common perceptions and resolutions. The emphasis of sophist rhetoric lies not only on shared perceptions or agreements, but on the changes that such agreements must produce in reality; its political proposal consists of “[...] employing the resources of the *logos* to bring about new and better states of existence in the world” (Autor, 2015, p. 73).

The philosophical character of a thought experiment is based on this tradition, especially when it uses the imagination to review historical events. One of the strategies of the sophists was to problematize canonical narratives to offer a “[...] provisional explanation of the human condition over time, resulting in a new form of discourse that suggests new solutions to the problems of social organization represented by democracy” (Autor, 2015, p. 73). This is what can be interpreted from the text in which Gorgias (1993) proposes to subvert the traditional narrative, coming from Homer, about Helena. Instead of characterizing Menelaus' wife as the perfidious woman who caused the Trojan War by fleeing with Paris, the sophist suggests three alternatives that, once accepted as plausible, would vindicate her before the community.

The first alternative raises the hypothesis that Helen succumbed to his fortune, which was already decided by the gods, whose will cannot be contradicted. As the weaker always yields to the stronger, Helen, in her human condition, has done nothing more than follow her fate, which is of a higher order. The second alternative establishes the assumption that Helen was the victim of the brute force of a man, who would have kidnapped her. He was the one to be hated, while she must be the target of pity; whoever subdued her was an aggressor; she, a poor victim. The third alternative suggests that Helen suffered the action of *logos*, speech, the sovereign who operates in a similar way to the gods, able to persuade the soul and transform feelings – as occurs during political debates and when reading poetry. This power cannot be fought against either and, therefore, Helen would have lost control of herself, carried away by the sweeping force of a seductive *logos*.

As a teacher, Gorgias may have written *Economium of Helen* with the didactic intention of awakening in his students the ability to interact with a canonical narrative, thus making them lords of history, as suggested by the Autor (2021b). As a master, the sophist uses a thought experiment in his philosophical-educational character to teach students to develop dramatic imagination to learn how to transform reality – a mythical reality, by the way. Gorgias acts as a creative historian teacher, anticipating the opinion expressed much later by Dewey, who, according to Cunha, Costa and Mercau (2020, p. 14), believes that, if the historian has “[...] dramatic imagination, the past will appear directly to the reader”.

Dramatic imagination consists of “[...] taking the learner to a fictitious scenario in which a certain educational action takes place” (Silva; Cunha, 2021a, p. 32). When associated with the thought experiment, it constitutes one of the pillars of learning support, since it allows not the mere contemplation of the school content to be studied, but a living experience of the learner before what is taught. Dewey (1959, p. 212-213) points out that dramatization is a characteristic of the human being, especially as a child: “Children are very capable of dramatic simulation: their attitude can make them believe (to the adult dominated by a philosophical theory) that a lesson impressed them.”

When a fictional narrative is created, whether about real events or not, to raise and test hypotheses in favor of solving a problematic situation, greater proximity is obtained with the student, which characterizes the sophisticated attitude of using the investigative process to transform the world through the creation of new knowledge. This knowledge is not identified with the answer to the problem itself, but with the power to encourage the audience to research and develop assumptions and tests of conjectures to achieve the desired end. The resulting new knowledge is the knowledge about the path necessary for research, like the scientific one, which is also engaged in the search for solutions. New demands will require further research and hypotheses, other results may be obtained, but the main gain provided by sophisticated education is the mastery of the way forward.

This is what happens with teacher Marta, a character in a thought experiment created by Silva and Cunha (2021a), whose experience serves to encourage teachers to share ideas and report their difficulties. In this

experiment, Marta dreams that she takes a short bus trip and, along the way, talks to an elderly man about the obstacles and challenges she faces in her work. Upon awakening, the character understands that that dream experience can help her change her pedagogical practices. A new knowledge about life, the value of the exchange of affections and a renewed willingness to act as a teacher, was achieved by Marta, and the thought experiment may have achieved the rhetorical objective of sensitizing readers to adopt similar behaviors.

The philosophical-educational purpose of the thought experiment can be achieved by keeping the students in the condition of public – readers, as in this narrative by Silva and Cunha. There is cognitive and emotional gain when an experiment, elaborated by the teacher, is used rhetorically as an example or as an illustration of a theory, but if what is intended is to obtain even more vigorous formative gains, it is possible to go further, taking as inspiration the didactic procedures of the sophists themselves. According to Silva and Cunha (2015), these procedures consisted of proposing that learners discuss problematic discursive situations related to relevant issues of the *polis* and try, by themselves, to find answers. In this regard, the sophists also anticipated themselves to Dewey and other contemporary education theorists who propose an active education, centered on the ability of students to act in search of knowledge.

Silva and Cunha (2021b) describe the activities of a course in which students are encouraged to elaborate creatures with modeling masses, inventing their personality characteristics, their life history, etc., with the purpose of giving concreteness to Dewey's notion of *experience*. It is a problematic situation – a rhetorical situation, according to Sophistics – that also presents itself in thought experiments with the educational power of this didactic strategy. They trigger the experimental attitude that will lead students to seek answers to problems that are meaningful to them. This method institutes practices of transformation of reality through reflection, invoking what, in Dewey's philosophy, is called *reflective thinking*. According to Dewey (1959), this mode of thinking is caused by a situation that evokes doubt, from which an investigation begins, like the scientific one, with steps to be followed to elucidate and resolve the issue.

The first step is to search for information and data about the problem; in sequence, hypotheses are created for its solution, which must have their probability of success carefully examined. Finally, the individual must deliberate on which of the hypotheses will be put into practice, to solve the problem presented. It is possible that the result is the failure of the hypothesis, however the process of thinking reflexively was completed and promoted the acquisition of new knowledge: knowing which path does not lead to the answer. If the hypothesis is successful, it will be evidenced that the path leads to success.

In the classroom, the philosophical-educational character of the thought experiment can be instituted through simple activities, such as the reading and appropriation of canonical works – Shakespeare's *Romeo and Juliet*, for example. To break the bonds of traditionalism that presupposes the passivity of the students in the face of the teaching oratory, the teacher will use such works to create problematic situations to be solved by the students. It can even update the plot, as was done in Steven Spielberg's *West Side Story*, which transports the Shakespearean lovers to New York City, where two rival gangs – the *Jets* and the *Sharks* – compete for the same territory and prevent the lovers from fulfilling their desires. A master sophist may suggest the displacement of this plot to the city or neighborhood in which the school is located, to explore local contradictions and rivalries, etc., and ask students to modify the conduct of the characters to avoid the tragic outcome imagined by Shakespeare.

Thus, a rhetorical situation is created: imaginatively solving the tragic situation of Shakespearean characters, inventing dramatic hypotheses to save lovers from death. The educational character of the proposal lies in the academic gain arising from the involvement of students with an important literary work, but its main advance concerns the development of the ability to create argumentative strategies to transform the social reality that surrounds them; to transform imaginatively, of course, but what matters in the thought experiment – as in rhetoric and, incidentally, also in education – is to create intellectual and affective dispositions aimed at intervening in reality.

## Final considerations

Dialogue in search of plausible answers, subverting an established narrative, mobilizing energies to develop the creative spirit, these are some of the possibilities made possible by the thought experiment when this resource is used within a pedagogy that aims at the humanization of pedagogical relationships and improvements in learning (Greene, 1995). There are many pedagogies that aim at these purposes, contrary to the passivity that predominates in traditional teaching approaches. In the previous sections of this article, we chose to privilege Dewey's pedagogy because, according to Crick (2010), Dewey is the most prominent contemporary representative of the rhetorical tradition and because of his emphasis on the value of reflection associated with dramatic imagination, a defining characteristic of the philosophical-educational character of thought experiments.

The choice of Dewey's pedagogy as the most suitable to host thought experiments is also because Dewey has elaborated a broad theorization in defense of the need to combine internal and external aspects to the individual, apparently irreconcilable opposites. Their analyses propose to break one of the most striking dichotomies of pedagogy.

The history of education theory is marked by the opposition between the idea that education is a development from the inside out and that it is a formation from the outside in; that it is based on natural endowments and that it is a process of overcoming natural inclinations and replacing them with habits acquired under external pressure (Dewey, 1971, p. 3).

The exposition made in this article about the experimental and narrative dimensions of the thought experiment meets the Deweyan propositions, because, by combining the typical parameters of a scientific investigation with the creative potential of fiction literature, this didactic resource recognizes and respects both the internal and external factors involved in the teaching process. Associated with Deweyan pedagogy, the thought experiment introduces more imagination, subjectivity, and emotion into rational thinking, breaking the logic of mechanical reason in force for centuries in education. The tendency to eliminate individuality and, at the same time, prevent the search for new paths for



the collectivity, falls apart in the face of the philosophical-educational character of the thought experiment supported by Dewey.

Because, according to Dewey (2002, p. 136), when asked about what should guide education, the answer is “more ‘passions’, not less”.

Rationality [...] is not a force evoked, contrary to impulse and habit. "Reason", as a noun, means the happy cooperation of a multiplicity of dispositions, such as sympathy, curiosity, exploration, experimentation, frankness, perseverance – to follow the things thought –, circumspection, to look at the context, etc., etc. [...] Reason, the rational attitude, is the resulting disposition not a ready-made antecedent that can be invoked at will and set in motion (Dewey, 2002, p. 136).

The thought experiment does not invoke reason as an antecedent, but uses the experimental attitude to recognize the fallibilist condition of the human being and inherent in any experiment. To reach reason, its proposal consists in triggering the dramatic imagination, the philosophical, reflective thought, from which the passions are not separated. The contribution of this type of experiment to education is to promote remarkable and truly educational experiences in the lives of those who attend them and those who participate in them. Through this method, schools can become mental laboratories that integrate cognition and emotion in the processes of decision and choice in the face of problematic situations, aiming at the transformation of reality.

Much was discussed in this article about transforming reality, an objective that, for the sophists, consisted in educating for democracy. Dewey's philosophy encompasses a systematic reflection on this theme, to which the philosophical-educational character of the thought experiment is also affiliated. This is because a thought experiment, by instituting reflective thinking, promotes the development of the ability to deliberate, since it is necessary to deliberate on the hypotheses created during the experimentation, choosing the one that must be put into practice.

Deliberating with oneself, through the hypotheses raised, is the first step towards understanding the importance of deliberation, one of the pillars of Sophistic and Deweyan democracy. According to Dewey (1959), consensus – called *homonoia* by the Greeks – is essential for the involvement of

all members of a community, thus consolidating the democratic way of life. Without the plurality of voices being heard and understood, each presenting different demands and defending different points of view, there is no truly democratic society, in Deweyan terms.

According to Dewey's view (1959, p. 93), democracy is not defined only as a set of institutions, but as a path to be chosen and continuously followed by everyone: "[...] a democracy is more than a form of government; it is a form of associated life, of joint and mutually communicated experience". This way of living is supported by the sharing of experiences, needs and desires of all citizens who, through dialogue, can have their voices heard and respected. Democracy, therefore, although it depends on formal components, is only maintained through people who share the same moral ideal and practice it daily.

Reiterating this synthesis, Mercau (2022) states that

[...] democracy is a moral ideal, a personal way of life that must be incorporated daily into various practices. Democracy is not fundamentally a set of institutions, formal procedures, or legal guarantees. What Dewey highlights is the culture and daily practice of democracy (Mercau, 2022, p. 3).

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Given the combination of public and private and the practice of reflective thinking, as highlighted in this article, the thought experiment contributes to the development and cultivation of a democratic culture, enabling an education aimed at preparing the individual for collective deliberation through the multiplicity of voices to be heard and considered. The deliberative process inherent in the thought experiment directs the student not to a previously established future, but to an imagined future based on real and ordinary life experiences. It is about facing the dialectic between public and private life with opinions, knowledge, and situations different from the usual ones, using argumentative strategies that transmit the personal worldview, without disregarding those of others, in search of agreements.

It is in this preparation for life that the choice of Deweyan pragmatism is based, not as a simple method, but as an option (Crick, 2003). Dewey (1959b, p. 55) opens the way to a seemingly impossible combination

– between significant school experiences and the conflicting social reality – by arguing that the most refined product of schooling is learning “with life itself” and making life a space for “[...] everyone to learn from the process of living”. The thought experiment aims to put into action the Deweyan precept that to educate is to teach how to think reflexively, so that the school provides the student with the experience of living life intensely.

## Notes

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2. The Stanford Encyclopedia of Philosophy offers an entry with very up-to-date discussions on the subject (Thought Experiments, 2023).

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