



Bring along the other: dialogue, togetherness, and possibilities in Science Education

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Abstract

This commentary paper dialogues with the paper “Facing neoliberalism through dialogic spaces as sites of hopes in science education: experiences of two self-organised communities” and deals with some issues raised by its authors. We present an episode to engage in the theme of dialogue, analysing its possibilities. We discuss what we consider fundamental aspects of dialogue and human development: the “insuppressibility of the ideological dimension of knowledge production”, the “inalienable condition of being agentive”, and the “inalienable collective nature of human life”.

Keywords Dialogue · Science education · Togetherness

O presente texto, integrante do fórum, dialoga com o artigo original “Facing neoliberalism through dialogic spaces as sites of hopes in science education: experiences of two self-organised communities” e trata algumas questões levantadas pelas suas autoras. Apresentamos um episódio para engajarmos no tema do diálogo, analisando as possibilidades dele. Discutimos aquilo que consideramos aspectos fundamentais do diálogo e do desenvolvimento humano: a “insuprimibilidade da dimensão ideológica na produção do conhecimento”, a “condição inalienável de ser agente”, e a “inalienável natureza coletiva da vida humana”.

He was the best physics teacher I had, although I couldn’t understand a word he said.

Some years ago, at the very beginning of an introductory physics course for future teachers, I [Juliano Camillo (The idea here is to keep the individual voices when it is, in some sense, relevant to the narrative presented in this commentary paper, even though it

This paper addresses issues raised in Betzabe Torres Olave and Paulina Bravo Gonzalez’s paper “Facing neoliberalism through dialogic spaces as sites of hopes in science education: experiences of two self-organised communities: <https://doi.org/10.1007/s11422-021-10042-y>.”

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is impossible to distill each voice in a process of dialoguing and writing together. From the very beginning, the development of this paper is an achievement of the joint activity of the authors, together with and inspired by, albeit asynchronously, the authors of the commented paper.)] asked students to think about their experiences with the discipline of physics when they were in secondary education. Specifically, I wanted them to thematize the way we conceive teaching and learning physics, and what it means to be a good teacher. One of the students decided to share his thoughts, and part of his elaboration is the sentence I used to open this section.

This remembrance resonates with my reading of the paper “Facing neoliberalism through dialogic spaces as sites of hopes in science education: experiences of two self-organised communities” and with what Mikhail Bakhtin considers to be the “the ideological becoming of a human being” which is “the process of selectively assimilating the words of others” (1981, p. 376). Unfortunately, along with words, many times we also assimilate that words of others are more valuable than ours; even though they are in some sense incomprehensible, we internalize that we are not eligible to say our own words.

Needless to say, language (verbal interactions, argumentation, and other variants that might fit under this overarching approach of language) has assumed prominent places in debates within many fields, including science education. Despite the recognition that hearing students’ voice is a valuable educational strategy (Baker 2020), dialogue, beyond its surface, i.e. including ideological aspects of human development and activism (by fighting against silencing different voices and against oppression in an increasingly unequal capitalist/neoliberal society), only recently has become more salient in science education (see, for example, Alsop and Bencze 2014).

In a similar vein, as a graduate student at the early stages of research in science education, reading the original article sensitizes me (João Otavio Garcia) to the split (also mentioned in Camillo 2019), between those who are entitled to produce knowledge and those who are not. This split might indeed assume different forms when it is expected that school teachers should simply apply theories produced (about school) by researchers at ivory towers of the university (Torres-Olave and Bravo 2021), or when it is assumed that history is only made by some few privileged individuals, whereas others merely suffer it. Besides that, neoliberalism has moved the narrative forward, despite the postmodern emphasis (or fantasy) on the death of grand narratives, of individualism and competition. It splits, in the context of research, the researcher and their concrete situation, and venerates the entrepreneurial researchers, who supposedly alone, and by the means of their own abilities, promote scientific development and, by winning the competition for funding, bring more investments to their own research (Ratner 2019).

Within this perspective, Torres-Olave and Bravo (2021) bring insightful and hopeful contributions to becoming researchers (of course their contributions are not limited to academia, but here we want to emphasize the urgency for new forms of being researchers in formal spaces) for a better world. First of all, Torres-Olave and Bravo (2021) show us that behind the research we can find people, with unique histories, intentionalities, and struggles. This is the most fundamental aspect when conceptualizing dialogue. There are no words/knowledge interacting by themselves in a free-human world. Dialogue, more than a formal verbal exchange (or pure verbiage), constitutes the way people collaboratively and purposefully create/transform reality (Stetsenko 2016). In this perspective, Torres-Olave and Bravo (2021) concretely present spaces of hope and ways to struggle against the pervasive structure of neoliberalism and individualism, albeit bringing fundamental aspects of the individuality of each research, which by no means stands in opposition to the collective dimension of human life. Besides that, the original paper prompts us to imagine a more

contextual and transformative science education, with an agenda that emanates from local problems, instead of being imposed by neoliberal needs.

Inspired by the original article, we engage in some issues raised in it and revisit, through the lens of dialogue, an episode to bring our own experience and reflection about dialogue and science education.

A ghost violates the second law of thermodynamics: using science to be monological

Professor, which is more likely to exist: a ghost or extraterrestrial life?

From the perspective of “being invited to the dialogue”, the episode I (Garcia) want to narrate (and revisit through the lens of dialogue) occurred during my research in 2019, under the supervision of Juliano Camillo. The educational intervention aimed at building together with future science teachers (in Initial Teacher Education) discussions about the nature of science. One day, during the break, one of the teachers, motivated by the discussions about science and its methods, wrote this question on the board: “ghost or extraterrestrial life?”, which was followed up by the question: “Professor, which is more likely to exist [...]?”. I didn’t think twice and rapidly responded “extraterrestrial life, because a ghost would violate the second law of thermodynamics”. My first impulse was to give an “objective”, detached or non-partisan response as if physics had the complete answer for that situation and I made dialogue impossible at that moment. In doing so I would be ignoring all the motivations, the intentionality, and, consequently the person behind that question. I moved the conversation to another context, far away from the place where the dialogue could start and develop. Instead of adding more contexts, more voices, more proximity, and creating more conditions for the dialogue, I used the voice of science as an external agent to be the final judge for an issue that had barely started between us.

This episode has provoked us and it has constantly been the object of our (Camillo and Garcia) discussions. To make one of our dialogues explicit, we chose to briefly change the structure of the paper, imagining this would invite the reader to dialogue with us while we approach the analysis of the episode, introducing a sort of “multilevel dialogue”: dialoguing with the dialogue about the dialogue.

Garcia: I was wondering to what extent the episode of “ghost versus extraterrestrial” is fruitful in thinking about the challenges of making dialogue possible. I am aware that there were many “voices” circulating in that situation: local knowledge, national standards, teacher education curricula, students’ voices, albeit I chose to be loyal only to science’s voice (or one version about science).

Camillo: The analysis of the episode highlights many challenges we face in doing research in science education, especially when trying to include multiple voices. One of these challenges directly relates to the way research (or knowledge production) is routinely conceived, based on the traditional canons of objectivity. As researchers, this “traditional voice” is always present in our practice, “haunting us” in every step we take, telling us to eliminate subjectivity, intentionalities, as if there exists a world without human beings or knowledge being produced from nowhere. This traditional voice is not an isolated phenomenon but is profoundly rooted in the way modern western society has developed. Prigogine and Stengers (1984, p. 40) give this formulation:

“Science initiated a successful dialogue with nature. On the other hand, the first outcome of this dialogue was the discovery of a silent world. This is the paradox of classical science. It revealed to [humankind] a dead, passive nature, a nature that behaves as an automaton which, once programmed, continues to follow the rules inscribed in the program. In this sense the dialogue with nature isolated man from nature instead of bringing him closer to it.” (Prigogine and Stengers 1984, 40).

Outside the scientific sphere, but still within the capitalist mode of production (whose damage is increasingly aggravated in the neoliberal era), we continuously face individualism and the tendency to “discover” (to use Prigogine’s term) the silent others, as an object that interests only for the sake of their usefulness. This might be formulated in terms of world vision, which is so pervasive and saturates our consciousness to the point that it gives the impression that an alternative form of the world, science, and human relationships is impossible. Thinking with Ratner (2019), the neoliberal ethos provides us with psychological tools for “perceiving, feeling, thinking about, remembering, motivating, expressing, desiring, and disliking things” (p. 10).

Garcia: Knowledge production is taken as a pure methodology as if we are using a device that is history-proof, human-proof, and independent of us humans and our relation to the problems we are dealing with. There is a continuous attempt to expurgate the ideological dimension in knowledge production. It seems that, despite living in a human-world, our efforts constantly seek to eliminate humanness from reality.

Camillo: Stetsenko (2019) formulates this issue in terms of ethico-ontoepistemology, meaning that there is no such world of things that simply is, but a world in terms of how things can “be changed in light of what there should be, given our commitments and ideologies, our politics and ethics” (p. 9). In this sense, it would not be possible to separate ideology and methodology, as they are not simply two juxtaposed processes, but they are, by their very nature, a single process in the ceaseless human endeavour of changing the world and changing themselves, i.e. producing reality.

Garcia: Even though my answer in the “ghost versus extraterrestrial life” episode was a lapse of monologism, using the voice of science, I believe that through the whole research we illuminated the ideological dimension of what we were doing. From the very beginning, we projected the intervention to be *with* the future teachers and not *for* them, avoiding what Torres-Olave and Bravo (2021) mentioned as an extractivist model, and assuming the challenge of making a contextually driven and place-based intervention. We commit ourselves to imagine what the intervention ought to be, not in a neutral or detached way, but pursuing what is not there yet. In this sense, looking to the future from the position we were in, we made the effort to bring in the “other” as a unique person and not as objects of research.

Camillo: I think this is one special consideration about dialogue. We have already mentioned that dialogue is not only words, and for the dialogue to happen the whole person should be brought to the scene (although this aspect needs to be clarified further in our discussion below). What is being brought into focus is the developmental nature of the dialogue. We are defending, supported by Dafermos (2018), that dialogue should promote development. This means not only the development of the other (the interlocutor to whom the interaction is directed) but the development of the whole relation, the whole dialogical situation. Engaging in dialogue means to engage in a process of mastering new forms to relate to each other and to the reality that would not be possible alone or before the dialogue.

Bringing along the other

Assuming the developmental nature of the dialogue means taking into account the very possibility of the dialogue, not taking for granted that it would be enough that one person talks to another for the dialogue to happen. Dialogue is about *being brought together* into (or jointly developing) a *space of dialogue*, which cannot be expected to ideally exist beforehand. Paraphrasing Marx (1972), we dialogue under circumstances transmitted from the past, but we should never rely only on the deterministic aspect of this statement, remembering that we also make these circumstances.

Coming back to the “ghost versus extraterrestrial life” example, there could have been joint development of a dialogic space if, instead of depositing the scientific answer, making the other a passive listener, it would have provided an invitation to add more contexts: “where does this question come from?”, “do you want to know how physics would deal with this question?”, “do you want to put different interpretations of the phenomena into the discussion?”. This would have created spaces for dialogue to take place, instead of assuming that they were already given by the activity in which we were all involved.

In this perspective, bringing the other closer to the voice of science does not mean making them a passive listener but creating engagement in activities where more voices can interact. Understanding science education as a tool for social transformation, we should bring scientific knowledge to the arena, to the space of dialogue. Instead of being an ahistorical and detached entity, science is revealed as being an answer/dialogue with some interlocutor in a concrete context, in a certain position of human history, produced by a community with intentionalities and struggles. This means that the criterion of truth is no longer some abstract authority of science (or scientists) but it is realized in concrete situations in which science has to operate ethico-ontoepistemologically. Resorting to Prigogine (1984), we might say that science cannot be understood as an automaton, whose devices should be learned and uncritically used. On the contrary, the use and our engagement in activities with tools of science transform the very nature of the tool and ourselves.

Although there was no space for the dialogue in that specific situation, now, in another level of analysis (or level of dialogue), the example of the “ghost versus extraterrestrial life”, re-analysed and brought into this “dialogue about dialogue”, can promote development. We can master new forms to engage in dialogic situations (although that situation will not repeat in the same way) and produce concrete reflections about dialogue, togetherness, and creating spaces (albeit small ones) to change traditional approaches to science. Besides, the analysis reinforces the impossibility of entering any space being neutral, and supposedly not assuming any ethico-ontoepistemological position. It would not have been possible to avoid giving an answer to the question. Even not giving an answer (being in silence) would represent taking a stance in the situation. By being agentic [giving up the agency is not a possibility (This point deserves a quotation from Freire (2001, p. 26): “In truth, it would be incomprehensible if the awareness that I have of my presence in the world were not, simultaneously, a sign of the impossibility of my absence from the construction of that presence. Insofar as I am a conscious presence in the world, I cannot hope to escape my ethical responsibility for my action in the world.”)] and acting necessarily with other people (purposefully and collaboratively), our commitment should be always, from the very beginning, with the expansion of the possibilities for dialogue to happen.

The inalienable condition of being agentic does not imply that agency is a property of an isolated individual. On the contrary, it presupposes that people are not merely in the world, but are necessarily participating in collective practices (isolated individuals

are a fantasy), producing the world (Stetsenko 2020). In this sense, there is no possibility of being in the world doing nothing. Every single act contributes even though it can be reinforcing the status quo. Every time I engage in research without being critical about my position, I am contributing to the maintenance of the traditional canons of objectivity. Every time I teach physics as an ahistorical corpus of knowledge, I reinforce the idea of a silent nature apart from human activity. Thus, we are always agentic and acting assuming an ethico-ontoeistemological position. That is the reason we understand that every space to foster dialogue, to imagine transformative practices, to pursue social justice, and struggle against neoliberalism and individualism is relevant. Torres-Olave and Bravo (2021) show how these spaces of hope can emerge in opposition to the prevalent structure of neoliberalism, which means, in concrete terms, that we can make history and not only suffer the circumstances we received from the past generations.

Not only is agency inalienable, but also the collective nature of human life. This means that it is not just a matter of choice to rely on others. Mészáros (1995, p. 306) would say that an “atomistically isolated individuality is an artificial construct”. Besides that, “the real individual is unceremoniously subsumed under his class from the first moment of groping for consciousness” and “is enmeshed in the network of social determinations”. However, the collective does not present only a negative facet of subjugating individuals. On the contrary, all human potential and development, including agency, is deeply rooted in communal practices, i.e. they are the achievement of togetherness (Stetsenko 2020).

From that, “bring along the other” is not related to the idea that the other was absent and now needs to be brought into the collective. On the contrary, whereas we recognize that togetherness is overlooked in many approaches, especially in neoliberal narratives about the human being and the world, our emphasis in the “bring along the other” aims at exploring the full potential of togetherness: being consciously together seeking by means of collaborative practices the transformation of unequal situations (Stetsenko 2016). Dialogue, and human development in this perspective, instead of being merely contingent, becomes a deliberate quest.

Conclusion

The reflections we presented here engaging in some issues raised by the article “Facing neoliberalism through dialogic spaces as sites of hopes in science education: experiences of two self-organised communities” is not an endpoint. Quite the opposite, it is one more voice in this potential endless dialogue, in which every interaction might add ideas, change points of view, deconstruct certainties, invite other people and create spaces of hope within neoliberalism. Not by virtue of words interacting by themselves, but because there are people engaged in creating possibilities for the dialogue to happen, for the other to be recognized as entitled to say a word and to collaboratively change reality.

In this commentary paper, we started thinking how monological we can be, postulating a free-human world, using a supposedly history-free knowledge, and generating more distance than proximity, which tends to annul the possibility of others to speak.

Unfortunately, the episode is not just an isolated situation. Western culture and more recently neoliberal society are full of monological situations. Neoliberalism has been vigorous in saturating our consciousness with the perspective that human beings are, by their very immutable nature, individualistic, and competitive. However, we might find all over

the world situations in which alternative versions about the human, world, and the future are being gestated. Torres-Olave and Bravo (2021) analysed two spaces of hope and presented their trajectories of becoming researchers in a collaborative environment. From their analysis, we engaged in elaborating what could be called the “insuppressibility of the ideological dimension of knowledge production”, the “inalienable condition of being agentive”, and the “inalienable collective nature of human life”.

Additionally, the original paper shed light on many other important issues that were not directly our focus in this commentary article. One of these issues is the relationship between global and local problems in the construction of science education curricula. In our view, this is closely related to the theme of agency, especially of school teachers vis-a-vis rigid and oppressive structures, manifested by means of global curricular standards that do not necessarily meet/dialogue with local needs. Hence, it is urgent to make agency consciously and effectively take place beyond individual teachers struggling by themselves, but in dialogue with a collaborative community.

Since collective practices are the foundation of human development, the possibility of dialogue could take place at different levels (teachers, school community, local community, university, and so on), and not be confined only to a specific space. Universities should engage in dialogue with schools not only to promote schools’ development but also their own development, by continuously producing knowledge in “togetherness”, aware of their ethico-ontoeistemological commitments. Following the statement presented by Torres-Olave and Bravo (2021) that science, and science education as well, are not *purely* methodological, but inherently *ideo-methodological* (Camillo 2019), there is no excuse for not taking a stance vis-a-vis oppressive situations or avoiding dealing with the “elephant in the room” of the political aspect of science education (Torres-Olave and Bravo 2021).

When assuming a non-dialogic stance, science becomes monological, and instead of creating sites of hope and transformation through dialogue reinforces the fetishized (and excluding) conception that science is only for a selected group or to serve the purposes of a neoliberal agenda, instead of being made by and for people, in their struggle and by means of an active engagement with others.

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