ACTA SCIENTIAE

ISSN: 2178-7727
DOI: 10.17648/acta.scientiae.7673

Contributions of the Theory of the Inclusion of the Other to Inclusive Mathematics Education

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Received for publication 4 Apr. 2023. Accepted after review 10 Jul. 2023
Designated editor: Claudia Lisete Oliveira Groenwald

ABSTRACT

Background: The post-colonial and anti-colonial theories in mathematics education, difference and inclusion led Souza and Skovsmose to create the term *deficiencialism*. **Objective:** To present the potential of Jurgen Habermas's theory of the inclusion of the other to contribute to concepts of inclusive mathematics education. **Design:** Considering that Habermas is a German philosopher who defends ethical communication to solve social problems, we believe that his concepts can help understand the idea of inclusion in teaching to guide the academic community towards a better understanding and positioning about who the Other is. **Setting and participants:** Jurgen Habermas (2018, 2019) and Ole Skovsmose (2014). **Data collection and analysis:** Bibliographical and theoretical study. **Results:** We found possible similarities between Habermasian theories and the critical mathematics education by Ole Skovsmose, each concept with its particularities converging on ethical communication that can favour a more inclusive mathematics education.

Keywords: Communicative action; Inclusion; Inclusion of the other; Critical mathematics education; Inclusive mathematics education.

Contribuições da teoria da inclusão do outro para a educação matemática inclusiva

RESUMO

Contexto: As teorias pós-coloniais e anticoloniais na educação matemática, na diferença e na inclusão levaram Souza e Skovsmose a criarem o termo *deficiencialismo*. **Objetivo:** Apresentar o potencial que a teoria da inclusão do outro de Jurgen Habermas tem para contribuir com conceitos da educação matemática inclusiva.

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Design: Partindo do princípio de que Habermas é um filósofo alemão que defende a comunicação ética para solução de problemas sociais, acreditamos que seus conceitos podem auxiliar nos entendimentos relacionados à ideia de inclusão no ensino, de modo a orientar a comunidade acadêmica quanto a uma melhor compreensão e posicionamento sobre quem é O Outro. **Ambiente e participantes:** Jurgen Habermas (2018, 2019) e Ole Skovsmose (2014). **Coleta e análise de dados:** Estudo bibliográfico e teórico. **Resultados:** Encontramos possíveis semelhanças entre as teorias habermasianas e a educação matemática crítica de Ole Skovsmose, cada conceito com suas particularidades convergindo para o uso de uma comunicação ética que podem favorecer uma educação matemática mais inclusiva.

Palavras-chave: Ação comunicativa; Inclusão; Inclusão do outro; Educação matemática crítica; Educação matemática inclusiva.

INTRODUCTION

The inspiration for this study came from reading the 2015 thesis "Deficiencialismo: a invenção da deficiência pela normalidade" [1] [Deficiencialism: the invention of disability through normality].

Souza (2015) was inspired by post-colonial and anti-colonial theories and a literature review in mathematics education, difference and inclusion area (Souza, 2015, p. 09) for building a theory. From their studies, Souza and Skovsmose created the term *deficiencialism*.

Since Skovsmose, with critical mathematics education, is one of the references for studying Inclusive mathematics education, we find possible similarities between this work and the theory of the inclusion of the other by Jurgen Habermas (2018). More than that, we understand that Habermasian ideas can contribute to inclusive mathematics education because they present concepts about who the Other is and about ethical communication for solving social problems.

[1] For more information, search for Souza, Renato Marcone José de. Deficiencialismo: a invenção da deficiência pela normalidade (Deficiencialism: the invention of disability by normality) 2015. 170 p. Thesis - (doctorate) - São Paulo State University, Institute of Geosciences and Exact Sciences, 2015. Guidance by Ole Skovsmose.

A LITTLE OF WHAT WE LEARN FROM HABERMAS

When considering inclusion in mathematics education, we must consider the role we and others play in society. Who are those people? By understanding who we are, we must consider who the others are –or better, who the other is. So, we must ask ourselves who The Other[2] is in a society where ownership and power are highly valued to the detriment of Being, Knowing, and Feeling.

The Other is someone who needs to be seen, understood, accepted the way the Self wants to be seen, understood, and accepted. The current public policies mention the word "equality" a lot, but today we know that much more than "equality", we must promote "equity" and "alterity".

A necessary theoretical basis for this research will be Jürgen Habermas and the concepts of his theory of inclusion of the other (Habermas, 2018) and the theory of communicative action(Habermas, 2019). A German philosopher and sociologist, Habermas has centred his works on critical theory, focusing his research on politics, ethics and communication. This author proposes that communicative[3] rationality overcomes instrumental rationality and exceeds Enlightenment rationality[4].

Habermas (2018) defends ethical communication to promote actions aimed at the inclusion of the other. The author addresses the political perspective of the inclusion of the other, constituting "an important contribution to the diagnosis of contemporary societies and reflection on the theoretical and normative issues that emerge from it" (Habermas, 2018, p. 13).

We must think of the other with otherness to seek equity and not equality. Habermas (2019) draws attention to the difference between equality and alterity, as considering the Other with equality is not the same as experiencing equity.

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[2] The word The Other appears here in capital letters to draw attention to the subjects who are the study object of this article, in order to maintain the way Jurgen Habermas approaches the theme.

[3] Communicative reason: based on rational, critical, and free communication, in which the subjects involved have an ethical posture in their speech (Habermas, 2019).

[4] Instrumental reason: when used, it aims to lead citizens to a naivety in which dominating capitalism prevails, transforming people into an instrument of maneuver. Enlightenment reason: For more information, search for Enlightenment (18th century).

> It is not just about tolerant attitudes of equal respect for each one, but also the requirement that each one be responsible for the other – that is, it is necessary to think about the relationships of responsibility and solidarity between people in their otherness, people who formed their identities in entirely different contexts of life and that are understood in the light of traditions that are strange to each other. (Habermas, 2018, p. 14)

The Other, as a citizen, needs recognition and productive participation in all segments of society, which seems obvious. However, when we pay attention to people belonging to groups known as minorities, this participation is not so clear; we want to believe that, one day, the term "minority" will no longer be necessary, as each citizen will have their place and differences will be accepted naturally.

We know that there is still a lot to be done and about that, Habermas also stated that

> The principle of equal treatment must consider two opposing policies: a policy of considering cultural differences and a policy of universalising subjective rights. One policy must compensate for what the other demands in terms of a universalism that makes everything equal. (Habermas, 2018, p. 346)

In fact, if going in search of the inclusion of the other means promoting equity, as suggested by Habermas, with public policies that lead to equality, then there is no sense in that. However, if the focus of our research is the inclusion of the other in mathematics teaching, then why are we bringing so much information about social and political issues? Because there is no way to approach the inclusion of the other in teaching without somehow presenting the inclusion of the other in society.

Promoting the inclusion of the other in mathematics teaching aligns with the perception of whom the subjects that cohabit in the same classroom are, recognising each individual and, thus, observing the importance of the search for alterity. The school space is one of the environments where this practice is most necessary, as offering equal education to all can cause exactly what we do not want: the separation between those who find it easy to learn mathematics and those who have more difficulties.

In this regard, Habermas (2018) alerts us to an important understanding:

> The aspect according to which people as such are equal to all other people cannot be asserted at the expense of the other aspect, which dictates that people as individuals are at the same time utterly different from one another. The reciprocal and equal respect for each one, required by difference-sensitive universalism, expresses a form of a non-levelling inclusion *that does not hold* the other *in their otherness*. (Habermas, 2018, p. 17)[5]

By understanding the concept of otherness towards The Other, we can put ourselves in their shoes to understand their needs and space.

Miguel et al. (2004) conceived mathematics education as social practices, that is, "as social activities carried out by a group of individuals who produce knowledge, and not just the set of knowledge produced by these individuals in their activities" (Miguel et al., 2004, p. 82).

Habermas (2018) draws attention to "equal respect and solidary responsibility for anyone". (Habermas, 2018, p. 14) When the author talks about the development of the national State and citizenship, he invites us to reflect on what it means to recognise, respect, and include the other in our universe. To understand what it means to include, we must first pay attention to the various ways of excluding someone.

Every day, we observe the exclusion of black people when they experience situations of racial prejudice, the exclusion of people with motor disabilities when faced with a lack of structure for their full exercise of coming and going, the exclusion of people with disorders when they do not feel that their characteristics are duly respected and so many other situations that can be experienced every day. Acceptance and respect for different characteristics go far beyond simple understanding and assimilation, as it is a matter of accepting and respecting the place of the Other to enjoy one's own accepted and respected place.

The fight against discrimination and prejudice towards the different characteristics of the Other must happen daily, in everyday situations, to eliminate this type of behaviour in all environments, especially in the

[5] Authors' highlights.

classroom, as we know the critical role that institutions schoolchildren assume in society.

Habermas (2018) presents the stimulating definition that "the inclusion of the other means that the borders of the community are open to anyone – and precisely also to those who are strangers to each other and who want to remain strangers" (Habermas, 2018, p. 15).

This author's statement agree with what we commented on combating discrimination; the same reference, when commenting on the understanding of the inclusion of the other, also reinforces that "what is equally good for everyone from the broad point of view of the *us* of a community which, in principle, cannot exclude anyone" (Habermas, 2018, p. 15).

To combat discrimination and prejudice and promote the inclusion of the other, ethical communication is an appealing path with great potential. But this battle does not consist only in recriminating prejudiced statements, as it also permeates the defence of the guarantee of rights.

When addressing inclusion, Habermas (2018) draws attention to the weight of discrimination in the context of equity and otherness. Discrimination against people's different characteristics can harm the proper development of a school-age student.

> Equal respect for *everyone* is not limited to those who are similar; it extends to the person of the other or the other in their difference. Also, assuming joint and solidary liability towards one another *as if they were one of us* refers to the flexible "us" of a community that opposes everything that is substantial and that continually expands its porous boundaries. (Habermas, 2018, p. 28)

When thinking about the different existing characteristics, we must have a sensitive eye to understand that there is no ideal pattern of behaviour; we must start from the principle that they are just differences, just different characteristics and that we can contribute to everyone's experience to happen in a dignified way.

From our studies on the inclusion of the other, we understand that teaching mathematics can happen through constant discussion and vigilance regarding current legislation and the curriculum. Promoting mathematics teaching from an inclusive perspective consists of understanding the social context in which the Other can be inserted, in order to understand that

> (…) learning means becoming a different person concerning the possibilities brought by this system of relationships to act with/in/from, mainly, that group. Ignoring this aspect of learning is to overlook that learning involves becoming part of a group. (Lave & Wenger, 1991, p. 53)

By possessing knowledge, the Other will become empowered, as they will be more able to observe and analyse their environment and act positively on it. Particularly regarding mathematics teaching of mathematics, if teachers adopt a critical attitude towards the contents and the inserted context, their students will also be able to learn this form of vision, as suggested by Skovsmose (2014).

The main form of access for teachers to students is through dialogue. Teachers own a fundamental tool for the development of critical citizens who are sensitive to the environment.

Since Habermas defends ethics in communication, we must also understand what comprises it. The author teaches us that communication between people can happen through instrumental reason or discursive ethics.

The instrumental reason happens when the individual makes the decision that to know is to dominate and control Nature and human beings. Thus, through the desire for new emancipatory policies to gain strength, Habermas proposes a critique of society and, among four types of possible actions in communication, the author proposes the communicative action, which consists of the interaction between individuals capable of adequate use of language and action, to reach understanding about some topic.

Habermas (2018) argues that communicative action is the most effective means to establish a dialogue to achieve better success in the search for solutions to social problems. Inclusion in teaching is one of the elements contained in this set.

Regarding the focus of this research, that is, the inclusion of the other in mathematics teaching, we know that its goals should not only be students with disabilities, disorders, or giftedness, as several possibilities can cause exclusion in the classroom.

Lima (2016) argues that:

> Inclusion should not be limited to students with conditions of disability; inclusion is related to promoting better opportunities for all students, especially those who, for various reasons,

> whether migratory, cultural, social, gender or lack of capacity, are at greater risk of exclusion and/or failure (Lima, 2016, p. 56)

To achieve this objective, the teachers' lesson planning is very important in the process. Despite all teachers' autonomy, they still allow practices to be imposed from the outside into the classroom, making it impossible for mathematics to be understood as a social practice accessible to all(Peralta, 2019). The analysis of one's own practice, centred on learning and sharing social practice, is the starting point for mathematics teaching to be an agent of inclusion, moving the sole focus from school performance and bringing all students into the picture, regardless of their special educational needs.

By accepting mathematics as a social practice, teachers understand it as a set of knowledge built and shared by a community that shares means, methods, and purposes (Miguel et al., 2004).

Habermas (2018), when presenting his theory of the inclusion of the other, defends communicative ethics in promoting inclusion through the discussion of the social-political context. For this, the author presents political theory studies to provide reflections on each citizen to build a diagnosis of the current democratic society.

> Habermas analyses the inclusion of the other in different areas: in the context of argumentation, which aims to explain equal respect and joint responsibility for each one, in discussions and positions on the development of the national State and the liberal conception of democratic, multicultural and globalised citizenship; in the conceptions of human rights and reflections on cosmopolitanism and international law; in the context of struggles for recognition in the context of democratic constitutional States and defence of the concept of deliberative politics based on the deepening of the links between the rule of law and democracy, (Habermas, 2018, p. 14)

The author draws our attention to the fact that including the other goes far beyond just having attitudes of respect and acceptance of the different existing characteristics. However, it is necessary to understand the public sphere of law to recognise the "us" to the detriment of the "I".

But here, we must be careful to analyse this context from Jurgen Habermas' (2018) main teachings: communicate and act ethically, and of

course, for that, we must take ethics as our basic principle so that reasoning is entirely driven by that way.

Many individuals do not understand that the other occupies a place different from theirs and that they must respect that place. Seeing the cultural, ethnic, and physical differences of communities or individuals is the first step towards recognition. When mentioning the verb "to see", we want it to be understood as not just a superficial observation but the perception of what surrounds that space, that place.

> At first sight, however, claims for recognition of collective identities and *equal rights of cultural forms of life* seem to be different things. These claims are today the object of struggles by feminists, minorities in multicultural societies, peoples who yearn for national independence or those formerly colonised regions that claim equality of rights status of their cultures on the international stage. (Habermas, 2018, p. 343)

From the moment people understand that their place is only theirs based on their own vision, they will understand and recognise the place of the Other. Very sensibly and pertinently, Habermas (2018, p. 346) states that the policies that consider cultural differences and the universalisation of subjective rights are opposing but must compensate each other regarding a universalism that transforms everything into equals.

By recognising their place and the place of the Other, everyone needs to take possession of tolerance, common sense, and ethics to understand what is "good for all" (Habermas, 2018):

> Ethical issues cannot be judged from a "moral" point of view regarding what is "equally good for all". The impartial judgment of ethical issues is measured much more on the basis of solid assessments, self-understanding, and the perspective of the life plan of particular groups, that is, by what "is good for us" from the perspective of those groups on the whole. (Habermas, 2018, p. 360)

There is no way to assume an inclusive position if there is no breaking of paradigms that still insist on acting in an individualistic way, in which tolerance is not always present. For example, faced with a wheelchair user (even if temporarily), the school chooses to change the class to meet that need better; however, other students who felt more comfortable in the previous room claim their rights.

It is up to the school institution to guide and clarify all the necessary points so that students have an empathetic attitude towards the educational needs of their colleagues. In this case, "good for everyone" is not above serving the individual.

> Tolerance is necessary if the foundations of mutual respect for legal persons remain intact. To the extent that the right to coexistence in equal rights is assured, the price for "bearing" this type of ethical difference can also be demanded from a legal point of view. (Habermas, 2018, p. 455)

WHAT DOES CRITICAL MATHEMATICS EDUCATION (CME) TELL US?

Critical theory emerged as an opposition to traditional theory, to challenge the structures of power to encourage citizens to go in search of a critical sense and question their own life and the political, economic, cultural, and social system of their environment.

As one of the trends in mathematics education, CME[6] aims to seek improvements in teaching and learning, to break with the discourse of neutrality and grant freedom to mathematics teachers to use all the school subject's potential to encourage discussions about society.

According to Araújo (2007, p. 21), "CME seeks to problematise the role of mathematics in society, in general, and in schools, as institutions belonging to this society" so that teachers question themselves at all times about "What content mathematics should students "learn"?"(Araújo, 2007, p. 21) Thus, they will be able to question themselves about so many controversial topics involving their societal experience.

The author informs that:

> For CME, the objective of mathematics education should not be simply to develop mathematical calculation skills but also to promote the critical participation of students/citizens in society, discussing political, economic, and environmental issues, among others, in which mathematics is used as a technological support. (Araújo, 2007, p. 21)

[6] Critical mathematics education

Since mathematics education emerged to deconstruct that traditional model of mathematics teaching, when priority was given to memorisation of formulas and repetition of exercises, without necessarily being inserted in a context, we have that critical mathematics education has contributed even more so that mathematics teaching makes sense to students, or at least to most.

Today's students no longer have the passive and often alienated attitude they formerly had. This is due to the schooling they are receiving, when teachers encourage dialogue, critical thinking, and questioning of social problems.

Nevertheless, we know there is still a lot to discuss; inclusion in mathematics teaching is a topic that really needs to break paradigms. Critical mathematics education has a substantial participation in this field.

Concerning people with disabilities, disorders or giftedness, teaching sensitivity is crucial because, for example, it may be necessary to choose which mathematical content these students should learn. Many students who have one or more of these characteristics need more time and/or different practices to learn specific mathematical content; therefore, possibly, the syllabuses for these students need adaptations. Araújo (2007, p. 22) points out that "Mathematics can be seen as a science that contributes to the exercise of citizenship, democracy, and subjects' emancipation".

Critical mathematics education draws attention to social and political issues through mathematics teaching. And the decision about what happens in the classroom can count on students' participation without harming the teacher's autonomy.

A fundamental reference for the study of critical mathematics education is Ole Skovsmose (2014). The author believes "critical mathematics education is marked by concerns" (Skovsmose, 2014, p. 120), and this is his proposal to approach critical mathematics education.

> My inspiration was the suggestion to understand responsibility as responsive-ability, and I see that the *mathemacy*[7] it is also composed of this ability to react and give answers, as well as to recognise that the world can change. I think it is important for critical mathematics education to explore what this would

[7] Mathemacy can be understood as mathematical literacy, according to Skovsmose in an interview for (Ceolim & Hermann, 2012, p. 19)

> mean for different groups of people, from marginalised people to expert professionals. (Skovsmose, 2014, p. 117)

However, when thinking about the concerns Skovsmose mentions, what are they? The author himself explains:

> My conception of critical mathematics education is that it is not only a sub-area of mathematics; just as it is not concerned with pedagogical methodologies and techniques or syllabus contents. Critical mathematics education is the expression of concerns about mathematics education. Concerns that can be expressed through the use of a few terms that I intend to present. (Skovsmose, 2014, p. 11)

Through the concerns we must have about our world to solve so many problems, it is not difficult to understand the importance of reflecting on all of this. So, Skovsmose (2014) also presents the concept of mathematics in action and relates the two ideas; initially, he explains mathematics in action:

> A critical conception of mathematics is presented based on the idea of mathematics in action and the consequences of using mathematics in modern society, whether in economic, administrative matters or technology and all types of human activities. Mathematics in action contributes significantly to shaping our life-world. (Skovsmose, 2014, p. 12)

When expressing his ideas about mathematics in action, the author states that he conceives teaching and learning as actions; in *Um convite à educação matemática crítica* [An invitation to critical mathematics education], Skovsmose (2014) explains that the act of learning is a form of action because it involves the action of those who are going to learn, who needs will, intentions, and motives, especially that involving school learning.

Mathematics teaching and learning can be stimulated with constant reflections on how the interpretation of its concepts can cause changes in the world. The author states:

> Every form of action requires reflection, which also applies to mathematics in action, which demonstrates an expanded conception of reflection and leads us to consider notions such as mathemacy and dialogue. (Skovsmose, 2014, p. 12)

By relating mathematical learning and dialogue in the same sentence in which he talks about action and reflection, Skovsmose invites us to deep studies, discern these concepts, and then relate them.

As teachers (Ponte, 2002), the author warned us about the need to reflect and analyse our own practice. As we seek to comprehend the teaching and learning process, we understand when Skovsmose relates mathematics learning, action, reflection and dialogue.

Skovsmose (2014) invites us to reflect on our role as mathematics teachers when he raises concerns about mathematics teaching:

> Could it be that the role of mathematics education is to preserve mistaken views of social and political order, which are deeply rooted in society? Have we lost ourselves as educators? Or is it that the interests of the labour market have always guided mathematics education, and we, mathematics educators, find it difficult to recognise it? (Skovsmose, 2014, p. 16)

The author also suggests that students can ask questions about activities and classes.

> Does traditional mathematics teaching contribute to imbuing students with blind obedience that enables them to participate in production processes in which executing orders without questioning is an essential requirement? Is such obedience a necessary condition for the functioning of so many existing jobs, and the role of traditional mathematics teaching in society is precisely to help establish this condition? Does blind obedience, which includes some submission to the regime of truths, feed the social and political apathy that is so appreciated by the forces of the labour market? (Skovsmose, 2014, p. 19)

From these ideas, we can see the importance of dialogue in the classroom. When addressing blind obedience, the author mentions the practice of solving exercises, in which teachers ask their students to solve huge lists of exercises to fix the content taught in the classroom. He cites as examples the statements of some exercises with orders to be followed: “Solve...”, “Find...”, etc. (Skovsmose, 2014).

The difference in this teaching method is that today, teachers can plan classes with their students. Of course, not all suggestions can be met, but

teachers can ask students how they would like the classes to be, for example, with students sitting in pairs or groups, with or without the use of videos.

The analysis of one's own practice related to teaching reflections on how mathematics can improve our world will bring about changes in teaching and, consequently, in student learning. Today learning depends on the necessary adaptations and adequate planning. Skovsmose explains it:

> For the ancient Greeks, who sought some form of certainty in knowledge, mathematics had a special value. Plato held that knowledge and certainty were within human reach, and mathematics was the most notable example. For Plato, our intellectual capacity allows us to unravel the world of ideas. Later, with the scientific revolution, the powers of mathematics gained a new format. It became common sense that the laws of nature have a mathematical character. Thus, through mathematics, and only mathematics, it is possible to capture the nuances of divine creation. The two lines of reasoning – that of certainty and that of the essence of nature – place mathematics as a superior form of empowerment. (Skovsmose, 2014, p. 19)

Mathematics education stimulates research and teacher education so that their teaching takes place in a contextualised way, considering the environment in which the majority of the school community is inserted. In this way, more people could learn and contemplate the beauty of mathematics with a closer look at some of its possible applications.

If teachers organise class planning aware that critical mathematics education encourages, they will have greater chances of reaching a more significant number of students, promoting inclusion in the classroom.

By remembering that several activities in our society are reserved for "those who have had a good education in mathematics"(Skovsmose, 2014, p. 20), the author explains that mathematics teaching must focus elsewhere nowadays to help students promote actions aimed at solving so many social problems.

> The discussion around the socio-political dimension of empowerment has a different content. Consider the issue of social justice in mathematics education in all its variations. At the root of this process is the expectation that mathematics education could concretely cause social and political impacts

> by promoting a different worldview. This is clearly expressed in various theories and formulations that align with critical education. (Skovsmose, 2014, p. 20)

Understanding the importance of mathematics teaching and what learning means permeates the awareness of how much it generates empowerment, emancipation, and critical citizenship (Skovsmose, 2014). Equivalently, we can visualise an action of inclusion of the other, of potentialization of the Being.

When discussing potential, a range of opportunities opens up, not just the examples cited. About this, Skovsmose (2014) states:

> Mathematics education can enhance in several ways. It can be empowering for some and de-powering for others. It is potentiating for those who seek to acquire skills valued by the job market. It is de-empowering as it reinforces a behaviour of adequacy and obedience to rules. (Skovsmose, 2014, p. 25)

Precisely for this reason, teachers must awaken in students the critical sense necessary to question the system: "In this line of thought, people are gears that must function properly, and the role of mathematics education is to take care of this adequacy" (Skovsmose, 2014, p. 24).

Skovsmose (2014) presented his critical conception by relating mathematics to discourse and power. Based on Foucault's ideas, he brought that "power can be exercised through language", (Skovsmose, 2014, p. 79) and from what he studied about Edward Sapir and Benjamin Lee Worf, he stated that language "shapes what we experience"(Skovsmose, 2014, p. 79).

The author states that "language contains elements of action" (Skovsmose, 2014, p. 80) and adds that:

> Any manifestation, affirmation, expression, sentence, question, etc. contains acts. So, promoting something is more than just saying something. Promising means doing something, and this act can be analysed in terms of its content, strength, and effects. (Skovsmose, 2014, p. 80)

Given the importance that the author establishes on the use of language, it becomes clear how much we must recognise the relevance of dialogue; in our case, particularly in the school environment. With everything related to language or dialogue, the author calls us to reflect on the ethical context behind words; by stating that "promising means doing something", he reminds us that

whoever promises something needs to keep the promise because the other expects it.

When explaining the use of language, Skovsmose (2014) states that "our experiences are structured by categories, which are projected onto our experiences. According to Kant, such categories are permanent (Skovsmose, 2014, p. 79) and he adds that language has a "crucial position for understanding what we call reality"(Skovsmose, 2014, p. 79). The author explains that language can project beliefs, categories, assumptions, conceptions, and misunderstandings, cooperating to build our reality.

To finish presenting some of Skovsmose's (2014) ideas about CME, we will bring the relationship that the author establishes between language and action:

> If we join the two ideas, that is, that language contributes to shaping reality, and that language contains actions, the way is opened for a performative interpretation of language and interaction between power and language – particularly about mathematics. Mathematics is often presented as a language. (Skovsmose, 2014, p. 80)

Starting from the understanding that mathematics has a formal language applied to different areas of knowledge, such as engineering, economics, medicine, etc., we see that this topic's teaching is powerful for communication, in which the teacher will be responsible for shaping students' interpretation. This is the time to provide opportunities, ethically, for experiences that contribute to students acquiring adequate knowledge and critical thinking so that they become conscious citizens and be change-makers in their environment and in the world.

FINAL REASONING

We believe in and defend a possible relationship between the concepts advocated by the famous authors whose ideas we discussed here because both defend that language can be used to search for solutions to social problems.

Therefore, we will present some ideas that we understand to be possible and can complement each other to promote inclusive mathematics education.

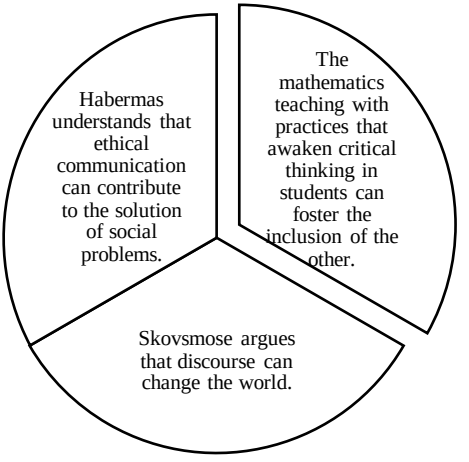
Both Habermas and Skovsmose advocate the use of communication and language. Skovsmose is a relevant world reference in mathematics

education; Habermas, on the other hand, is not from the same area, but we believe in the potential of his ideas for education in general.

Figure 1 summarises what Habermas and Skovsmose advocate about respectful and ethical communication that can foster effective changes in the social reality of many people, based on the teaching stance in the classroom. These ideas converge to the possibility of a mathematics teaching-learning that happens through practices that contribute to the inclusion of the other.

Figure 1.

Congruences of ideas by Ole Skovsmose and Jurgen Habermas for the construction of inclusive mathematics teaching.



Habermas (2018), in defending that ethical communication can contribute to the solution of various social problems, also draws attention to the possible individual interpretation of what "good for all" means. This permeates the concepts of morality and as it depends on what each person understands as morality, we may go through what is happening socially today, which generates so much social inequality.

Precisely for this reason, Habermas (2018) highlights the importance of "impartial judgment of ethical issues" (Habermas, 2018, p. 360) through much debate and collective understanding so that ideas of what is "good for all" are assimilated from the point of view that social inequalities must be

fought, even if this concerns specific groups. By improving the lives of particular groups that really need changes so that their dignity is not neglected, one must understand that other groups may not need the same assistance. This is called equity.

When Skovsmose defends that mathematics teaching happens in a way that the teacher contributes to the development of the students' critical sense, this practice is carried out as Araújo (2007) describes when lecturing on critical mathematics education:

> The objective of mathematics education should not be simply to develop mathematical calculation skills but also to promote the critical participation of students/citizens in society, discussing political, economic, environmental issues, among others, in which mathematics is used as a technological support. (Araújo, 2007, p. 21)

Thus, critical mathematics education contributes to making the teaching of this topic a social practice in which not only a set of knowledge is shared but also everything that can emerge from this knowledge.

Skovsmose (2014) also highlights that reality can be modified through language when it provokes beliefs, assumptions, and conceptions. In this way, the author teaches us, based on Foucault, the power of language and communication to bring about changes in the world.

Such changes in the world can begin with the results of the teaching and learning process. For example, the mathematics education area emerged from the need to make changes in mathematics teaching, which previously focused on rigour, memorising formulas, and doing out-of-context calculations.

Today, students are protagonists of reflective and critical teaching and learning process; teachers are no longer the only holders of knowledge.

Skovsmose invites teachers to think, to continually question their pedagogical practices and their role in the world. He also encourages teachers to stimulate their students by asking questions about their reality and environment to make them reflective and critical citizens. The way teachers will use most to play this vital role in students' lives is dialogue.

Each person builds the citizen in him/herself, through knowledge and lived experiences. If a citizen is reflective and critical, he/she will be able to interfere positively in their environment.

In professional life, as Skovsmose questioned: Is blind obedience a necessary condition for several jobs to exist? A critical citizen can significantly contribute to the growth of society without becoming a cog in the system (Skovsmose, 2014).

Some understand that studying mathematics requires posture, discipline, and attention, behaviours that can contribute to a lifetime, as it can build a profile. However, the teachers are the ones that must intervene appropriately so that students, especially children and adolescents, reflect and understand the whole process they will go through after leaving school.

In all situations, human beings are invited to dialogue. It is the path of socialisation, building relationships and spaces. Communication, whether through speech or any other language, such as sign language, is how people interact.

Nevertheless, in this communication, ethics is the main element that needs to be present. With ethics, the subjects involved will respect each other and have greater chances of establishing healthy and productive contact.

Habermas defends this ethics in communication. Through ethical communication, the citizen can encourage the other to think about their place, environment, and way of life, stimulating recognition and respect for the Being to promote inclusion.

By considering The Other as a Being that needs to be recognised and respected in their otherness, Habermas (2018) seeks to promote inclusion by stating that tolerance of different characteristics is not enough. In this case, communication is the right way to emphasise the importance of everyone being responsible for each other to reduce the social distance between The Self and The Other. According to this author, it is necessary to continuously reflect on the context of recognising, respecting and including The Other in our universe.

The author also highlights the importance of fighting discrimination and prejudice to eliminate behaviours of this nature in all environments. The school environment is a valuable space for reflection, discussion, and changes in thinking, but this happens through constant dialogue. This dialogue is the communicative action that Habermas (2019) advocates for fostering the inclusion of the other (Habermas, 2018).

Lave and Wenger (1991) stated that learning consists of becoming another person based on the possibilities offered by the system. Since one of Habermas' focuses of analysis for the inclusion of the other is the context of the

argument, with a view to highlighting equal respect and joint responsibility (Habermas, 2018, p. 14), we cannot forget that the author argues that this argument should always be guided by ethics.

Regarding mathematics education, Skovsmose (2014) draws attention to the importance of questioning this same system to not allow people to be treated as cogs.

Again, we will cite Skovsmose (2014) when he says how much language can delineate our reality. The appropriate use of this language at school, that is, with ethical communication (Habermas, 2019), will enable students, as future citizens, to make effective changes in society, using all the power that language provides.

Considering mathematics teaching is a social practice, we believe that the ideas of Habermas and Skovsmose can lead us to congruence in the interpretations since both defend using language and discourse in a proposal of ethical communication to solve social problems.

Within the set that involves mathematics education, there are several lines of research: inclusive mathematics education and philosophy of mathematics education are some of them. As Habermas is a philosopher, we understand that his contributions can enter the field of philosophy of mathematics education to contribute to the inclusion of the other.

AUTHORSHIP CONTRIBUTION STATEMENT

YPBQG and WBLP built the presented idea. YPBQG developed the bibliographic and theoretical study, adapted the methodology to the context and developed the text, formatting it according to the template. WBLP developed the bibliographic and theoretical study, and analysed and corrected the text. All authors actively participated in the discussion of the results, reviewed and approved the final version of the work.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as it is a publicly available bibliography search.

ACKNOWLEDGEMENTS

This work was supported by the Coordination for the Improvement of Higher Education Personnel – Brazil (CAPES)

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