

The Ethical Dimension of Creative and Collective Insubordination: A Philosophical Incursion in Mathematics Education

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ABSTRACT

Background: Creative insubordination in mathematics education has been instituted as a research field that favours the development of pedagogical and training practices that fight oppression and social exclusion. **Objectives:** This article seeks to theoretically develop the concept of creative insubordination as an ethical act, establishing the importance of collective insubordination actions for the maintenance of their creations in defence of the oppressed and exploited. **Design:** Research in the philosophy of mathematics education is articulated with reflections on pedagogical practices in mathematics teaching from a critical-ontological and ethical perspective. **Setting and Participants:** This work reports the experience of teachers who teach mathematics in a popular education project. **Data collection and analysis:** we analysed three examples of creative and collective insubordination seeking to understand how these are characterised as ethical acts and the learning that we can obtain from them for our insubordinate actions in the teaching of school mathematics. **Results:** We conclude that insubordination is only creative if—and creations are insubordinate only if—it is an ethical act, i.e., a collective act. Therefore, the collective factor needs to be reinforced in research and in insubordinate proposals in mathematics teaching.

Keywords: Creative insubordination; Philosophy of mathematics education; Ontology; Ethics.

A dimensão ética das insubordinações criativas e coletivas: uma incursão filosófica em Educação Matemática

RESUMO

Contexto: As insubordinações criativas em educação matemática têm se consolidado como um campo de pesquisa que propicia o desenvolvimento de práticas

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pedagógicas e formativas que combatem a opressão e a exclusão social. **Objetivos:** O presente artigo busca desenvolver teoricamente o conceito de insubordinação criativa como ato ético, estabelecendo a importância das ações coletivas da insubordinação para a manutenção de suas criações em defesa dos oprimidos e explorados. **Design:** articula-se as pesquisas do campo da Filosofia da Educação Matemática com reflexões sobre práticas pedagógicas no ensino da matemática em uma perspectiva crítico-ontológica e ética. **Ambiente e participantes:** se referem a uma experiência de professores que ensinam matemática em um projeto de educação popular. **Coleta e análise de dados:** analisamos três exemplos de insubordinações criativas e coletivas buscando compreender como estes se caracterizam como atos éticos e o aprendizado que deles podemos obter para nossas ações insubordinadas no ensino da matemática escolar. **Resultados:** concluímos que a insubordinação apenas é criativa se, e as criações são insubordinadas apenas se forem atos éticos: isto é, coletivos. Portanto, o fator coletivo necessita ser reforçado nas pesquisas e nas propostas insubordinadas em ensino de matemática.

Palavras-chave: Insubordinação criativa; Filosofia da educação matemática; Ontologia; Ética.

INTRODUCTION

Research on creative insubordination has proved to be a powerful tool to highlight the resistance tactics of math teachers to the official curriculum, oppressive relations and violence in the classroom (Lopes & D' Ambrosio & Correa, 2016; Gutiérrez, 2013b). On the other hand, strategies in mathematics teacher training in favour of acts of creative insubordination have demonstrated the need for collectivity and the search for allies (Gutiérrez, 2016, 2018).

The question that this paper poses is to what extent this need for collectivity has been allowed and analysed in research on creative insubordination, and how research can contribute theoretically to the understanding of this collective need in the insubordinate acts of mathematics teachers. The collective organisation of teachers for collective acts of insubordination is a problem for the field of ethics; however, the ethical dimension has been reduced to empty statements in recent research. For example, Lopes, D' Ambrosio and Correa (2016) understand ethics as a teacher's personal question and thus confused with the premise of professional ethics in times of large corporations, when ethics and morality are conflated. In Gutierrez (2016), for example, moral aspects are advocated as a strategic field in acts of creative insubordination. In short, the ethical dimension has been applauded in research of creative insubordination but assumed to be free of conceptual problems and, therefore, effectively neglected.

This article aims to demonstrate that the ethical and collective dimension of insubordinations in mathematics education is broader than just the relationships between individuals in the micro spaces. That is, in addition to these dimensions, ethics and collectivity need to be linked to a conception of the totality of the social being that strengthens the processes of emancipation (Radford, 2012), breaking an illusory conception in mathematics education.

Thus, this article will be divided into three moments, the first one trying to discuss the problem of ethics in mathematics education and capitalist society developing the concept of the ethical act. The second moment is to argue that insubordinate creative acts are ethical acts only if accompanied by collective organisation and action, i.e., in this article, insubordination occurs in the face of the concept of creative insubordination demarcated in the literature. It is in this moment of theoretical insubordination that we will discuss the insubordinate and creative acts in the collective actions of outstanding teachers and secondary students in the movement against the reorganisation of public education in the state of São Paulo in 2015. The third and final moment will zoom in on mathematics teachers' collectives discussing acts of creative and collective insubordination in a popular education project that resists the entrance exam in the city of Florianópolis, Santa Catarina state.

THE PROBLEM OF ETHICS IN MATHEMATICS EDUCATION

The ethical dimension in mathematics education can be discussed on two grounds: the socio-political, discussing the values and actions for social justice, and inclusive education for students with disabilities (Ernest, 2018a; Roos, 2020). According to Ernest (2016), intrinsically, mathematics has good ethical potential for humanity, with its possibilities harming individuals in their external values (Ernest, 2018b). Thus, ethics in mathematics education refers to a discussion of existing social values and their influences on the field of mathematics and mathematics education.

On the other hand, the cultural-historical perspective has sought to support its ethical discussions by criticising the views that understand the student as a private owner of knowledge where collective practices would only be an instrument for production (Radford, 2014; 2012). That is, recognising the student as an ethical being is directly articulated with the problem of the possibility of emancipation, not as individualistic freedom and autonomy, but in collective work (Radford & Roth, 2011; Radford, 2012).

Boylan (2016) understands ethics as a heuristic dimension in mathematics education that makes it possible to analyse and structure forms of relationships and areas of action. In this theoretical framework proposed by the author, it is possible to specify four dimensions: the relationship with others, the social and the cultural, the ecological and the relationship with oneself.

In mathematics education, ethics has been a discussion closely linked to the historical-cultural perspective, based on Marxism, but limited to a conception of collective work as a relationship between individuals. In other words, the ethical dimension would be possible only in the micro-relationships of the classroom or other educational spaces, and an ethical position would start from these micro-spaces. In fact, this dimension of relations between individuals is a constituent part of ethics; however, they are a limited dimension of analysis, although it is the only one possible in capitalist society (in the following sections, I will further explore the concept of ethics and ethical act). In this way, this article seeks to complement this discussion on the ethical dimension in mathematics education, following a historical-cultural and Marxist basis, in the sense of seeking to understand ethics not only as a relationship between individuals but as a relationship of social-historical subjects with the universality of the social being, that is, based on a conception of the ontology of the social being (Lukács, 2013). For this purpose, we hope that the analysis of the examples will contribute to this new understanding

THE PROBLEM OF ETHICS IN CAPITALIST SOCIETY

For Lukács (2012, 2013) the ontological foundation of social totality is the process of generalisation triggered by labour, the basic presupposition of the human being, characterised by the modification of nature through teleologically put actions for the sake of their survival. The generalising character of the act of labouring is given by the fact that it leads, in its objective and subjective consequences, always beyond its immediate purpose. In the teacher's labour, for example, where the immediate purpose is the student's learning, the teacher also experiences subjective consequences, such as new learning with errors and successes of his/her methodologies and objective consequences with his/her students acting socially in a responsible manner, among others.

This process of generalisation of labour as the ontological foundation of the social being will allow, from the production of knowledge and skills beyond the immediate ends, the unfolding of this knowledge and skills in the

employment of situations very different from those initially employed and socialised with the collective of members of society. In this way, through the flow of social praxis, labour articulates the singular acts of global social processualism so that singular acts can be generalised in a social-historical tendency as singular global acts (Lukács, 2013). An example of this is research in mathematics education that seeks to allow the generalisation of teaching methodologies of singular teachers to other teachers, and that can become powerful in the more general teacher training.

However, this movement of singular acts to become generalised as global acts from labour does not dispel the contradiction between individuals and society, between being singular and being generic. This contradiction appears clearly in the mathematics classrooms when we present a mathematics formed by geniuses and absolutely convinced of its results because, in this way, it serves the interests of a particular social class (the dominant one) and obliterates the needs of the rest of humanity, especially of the oppressed and exploited classes.

The generic being, the social totality, is not simply the sum of all parts of individual human beings; it is not the simple juxtaposition of the parts that form it. On the contrary, it contains qualities, processes, and needs that are not always present in each individual that constitute it, as the individual beings can carry qualities and needs that are not present in the social totality. That is, the singular being and the generic being keep specificities that are placed in a relation of tension at different moments. In short, the two dimensions of the social cannot be cancelled; they are equally real, since they exist even without their awareness of them (Lukacs, 2013).

The ontological foundation of universal values (justice, beauty, etc.) are also social relations that act objectively on social reproduction, and the objective contradiction between singular being and generic being is the most general ontological foundation so that, in social reproduction, individuals can raise to consciousness, on a social scale, the contradiction between what they are as individuals and what the society to which they belong is. This contradiction is also objective and existent, even if we are unaware of it, and will directly influence the relationship between individuals and society.

Is this contradictory social base emerging values such as justice, equality, and freedom, among others, being always concretely put historically by the generic-collective needs and, therefore, diverse in diverse periods?

One of the most striking features of human society is what Marx (1982) called the removal of natural barriers, the movement in which social complexity increases considerably in the measure of its development, and thus requires more and more complex mediations in relations to enable social reproduction. Suffice it to think, for example, of the technological development given by the ever-greater need for the large-scale production of wealth to supply human life. Such complexities will assume the purpose of mediating individual needs with the generic needs always given by contradictory relations, as seen previously. More than this, these mediations will be responsible for raising to consciousness these contradictions of individual-generic needs and possibilities so that, overcoming individual needs, human-generic needs are made visible.

This is the ontological foundation of social complexes such as tradition, justice, and ethics for Lukács (2012, 2013), so in each historical moment “such complexes have as their social function to act in the space opened by the contradiction between humankind and individual, to make it socially recognisable” (Lessa, 2015, p.16), thus allowing human beings to choose between values that express human-generic needs or the particular needs of social groups. These choices are made even in the singular acts linked to the reproduction of the individual that chooses —because, at any moment, we must assess the needs that are at stake— between what is more or less useful, between what is more and less urgent. The genesis of ethical or unethical choices comes in these comparisons between the generally contradictory needs of individuals and human generality.

Morality and ethics, the complexes that interest this article, are also founded ontologically in this complex of problems caused by the contradiction between the individual being and the generic being. Ethics in this aspect is a much more important complex than what we are discussing in the article; it is not a simple set of theoretical precepts that we assume in our consciousness, but above all, a social complex with specific and general purposes in each historical period. Its function is to make explicit to the human conscience the constant conflict between singular and universal, to overcome the dichotomy between individual and society, it is the function of the social complex of ethics to overcome the antinomy between an individual and humankind (Lessa, 2015).

Thus, the ethics complex is responsible for solving the social contradictions also present in mathematics classrooms: oppression and exploitation. In addition, since it is not simply a set of theoretically idealised precepts but a set of objectively existing social values, we can see that it is not always possible. In short, what would be an ethical school, an ethical classroom,

or an ethical society? Nothing but spaces where individual needs were not in conflict with each other or with human-generic needs. In an ethical society, for example, there would be no contradiction between the social relations of production and the destruction of the environment. In an ethical classroom, content taught and prescribed by the official curriculum would not be objects of oppression to minorities.

The question that arises is why a social complex of ethics is not possible in today's capitalist society. It is necessary to understand that the value relations established in capitalist society are those of bourgeois individualism (Lessa, 2015), objectively characterised by the reification of social relations as natural relations, the natural law of private property, ignoring that historically there have been other social relations of property (or no property at all!), and the reification of the individual from the commodity fetishism (Marx, 1982). The bourgeois individualism is the theoretical expression of the full relationship antinomial between individual and society, where society is the structure that constantly prevents the individuals from fulfilling their needs ("too many taxes", "too much government", "excessive rights"), and so on the plane of objectivity precisely establishes the values that govern society. To satisfy the individual needs fetishized by the commodity and reified by the social relations of private property, they advocate that the choices between alternatives should be made for the immediate satisfaction of individuals or social groups to the detriment of human society. It is enough to think of how big corporations behave and how most of their "social responsibility" actions are made only and exclusively if they allow a medium-term financial contribution. It is by the reified relations of capitalist society in which individual interests or social groups overlap the human collective that an ethical complex in present-day society is impossible. Therefore, the constituent of a social ethic worthy of this name goes by overcoming the current state of affairs, the destruction of capitalism, because there is no "ethical capitalism". In other words, in a capitalist society, "ethical education", "ethical school" and, much less, "ethical mathematics education" are not possible.

However, the impossibility of full ethical realisation in capitalist society does not mean that there are no objective and subjective conditions leading to ethical acts and the need to establish ethical relations. In sum, as we have already stated, the social function of ethics is to connect human-generic needs with the overcoming of the antinomy between individual and society. Consequently, such needs for social reproduction, ethical needs, are present in capitalist society in favour of the possibility of human survival. Such specific ethical needs are what I call ethical acts, social actions of collectives and

individuals that seek to overcome the antinomies between individuals and society, i.e., that seek to overcome the relations of oppression and exploitation in capitalist society. If we cannot achieve full ethics, we can constitute ethical acts. However, such acts will only be effectively endowed with ethics if they immediately link the social functions of ethics. Therefore, ethical acts must always be geared to the needs of the development of the human race, and at the same time, to the overcoming, in practice, of the individual/society antinomy. Consequently, the first postulate of ethical acts is established by resistance and struggle against all forms of oppression and social exploitation for the sake of full human development, articulated with the destruction of white supremacist and patriarchal capitalist society, using the words of Gutiérrez (2018). Just as in overcoming the individual/society antinomy, one must overcome the postulated relations of bourgeois individualism by seeking collective social relations that strengthen relations between individual and society as parts of the same social collectivity. This overcoming is more than belonging to a social group, or a sense of belonging to a minority and fighting against these oppressions, but the feeling of belonging to humankind, to the totality of the social being. Therefore, collective relations in favour of an identification of individuals with themselves and with all humanity, with their history and knowledge, are fundamental parts of the ethical acts.

The question now is whether creative insubordination can be considered ethical.

CREATIVE AND COLLECTIVE INSUBORDINATION (CCI) AS ETHICAL ACTS

Many researchers into creative insubordination (Hayes & Licata, 1995; Gutiérrez, 2013b; Lopes & D' Ambrosio, 2015; Lopes, D' Ambrosio & Correa, 2016) take as a methodology to discuss teachers' individual actions to exemplify, characterise, and prospect the trends of collective insubordination. Such teachers' actions would be characterised as:

Subversive mathematics teaching, among other things, creates a counter-narrative to the achievement gap discourse; questions the forms of mathematics presented in school; highlights the humanity and uncertainty of mathematics; positions students as authors of mathematics; challenges deficiencies of students of colour in need of mathematics; and recognises that not all

students aspire to (or should) become research mathematicians or scientists. (Gutiérrez, 2013a)

That is, for Gutiérrez (2013a), mathematics teachers must consolidate a movement toward the humanisation of mathematics classes, resist oppressive relations during classes, and subvert the official curriculum, always thinking about the best development of their students. Therefore, for Gutiérrez, creative insubordination takes a position in favour of the more general needs of humanity, the first characteristic of ethical acts; however, their statements always speak of acts of individual teachers, of how these teachers should impart their classes, seek allies, to discuss moral issues, to think about strategies of insubordination in mathematics classrooms (Gutiérrez, 2016). The same is repeated in the work of Lopes, D' Ambrosio, and Correa (2016) when analysing the narratives constructed based on a teacher who teaches mathematics, and in this respect, agree on creative insubordination as acts for the defence of human community expressed by their students. However, the consolidation of collective relations that overcome the antinomy between individual/society is not present. One of the hypotheses in my doctoral thesis is that these actions may be present in the actions of these insubordinates, which have not deserved so much attention from the researchers so far. One of the proofs of this possibility and the veracity of the hypothesis is pointed out by Gutiérrez (2016) when she places the search for allies as a strategy in creative insubordination in mathematical education. However, it is not in the scope of this article to defend this hypothesis; rather, by assuming it to be true, disclose how these relations that overcome the individual/society antinomy are present in the creative insubordination.

To make believe that creative insubordination requires this collective character to characterise as ethical acts, I have added to the title the “collective” noun and rebelled against the understanding adopted by literature, to express that, to be essentially insubordinate in the ethical sense, one needs to be collective. For these conclusions, let us take some historical and current examples.

THE OAXACA COMMUNE (2006): THE TEACHERS' STRIKE

The battles of Oaxaca, a southern state of Mexico largely formed by natives, are recent historical examples of anti-systemic and radical struggles. The Commune of Oaxaca, as it was known, portrays the story of the 2006

uprising that began with a teachers' strike for a salary increase. Its history can be better understood by watching the documentary "Um poquito de tanta verdad" [A little of so much truth]. In 2006, teachers from Oaxaca camp in the central square of the capital, also Oaxaca, in defence of the salary increase. This movement causes violent repression of the state government against the teachers, who, with the support of other social entities and the solidarity of the community, are again entrenched in the central square, and this time, organising fronts of defence against police violence. Police truculence brings the community's support to the striking movement and other 365 entities (Oliveira, 2011), however, its main characteristic is not the uprising process, recurrent in the Mexican indigenous states and movements against neoliberal policies in Latin America, but claiming the creation of institutions that would replace the Official State of Oaxaca, in this case, the Popular Assembly of the Peoples of Oaxaca (APPO). The movement is the synthesis of different experiences of the social movements (Oliveira, 2011), and their efficiency is largely characterised by the attitude of the striking teachers of Oaxaca to call the population to a non-defense movement of education, or wage increase, but of the broader and more latent patterns of the community of Oaxaca. In sum, Oaxaca's creative and collective insubordination begins with the ethical principle of the striking teachers to overcome, on the one hand, the antinomy between individual/society that could make them defend only their private interests or put their movement at the service of the oppressed and exploited social collectivity of Oaxaca, favouring and allowing the constitution of a powerful social movement. The main feature of the success of the Commune of Oaxaca is what we call, in the heart of the left, 'the basic labour', the pedagogical labour of movement that raises the community's awareness about what is happening. Moreover, the movement initiated by teachers culminates in tactics of historical, social movements of the classes exploited by capital (barricades, strikes, pickets) in line with the perspectives of the indigenous ancestry of Oaxaca. It was a pedagogical movement for the local population, which maintains its struggles against oppression and exploitation until the present day. The Commune of Oaxaca lasted six months and established new social relations of production and reproduction of life, where decisions were taken at local and central assemblies, and such assemblies organised the production of the most urgent goods (such as food and water), security, the strategy of the struggles, and the demands of negotiation. During those six months, the APPO took over the management of the state of Oaxaca and the official means of communication and established another way of living based on the association of the indigenous matrix in planning the economy and self-organising the government without intermediaries or professional politicians. This

characteristic can be understood by Professor Guadalupe's statement: "Esto es lo que explica cómo pudo sostenerse el movimiento durante todo este tiempo. No hay ningún oscuro financiamiento, ni ningún partido: es simplemente la gente" (Rejas, 2007, 40).

The taking of the media led to an independent and powerful cultural creation with poetry, graffiti, performances, music, and others (Oliveira, 2011). Meanwhile, the Commune was defeated by Mexican state forces that killed, tortured, arrested, and infiltrated agents for demobilisation. Nevertheless, the effects of this creative and collective Oaxaca teachers' insubordination still impact Oaxaca and the Latin American indigenous and proletarian social movements today.

With the Oaxaca Commune, we can perceive the potential for resistance and social struggle of creative and collective insubordination (CCI). However, not all CCI need to be of this magnitude; they can and should always start from small jobs, small collectives. The APPO reminds us that the Commune resisted for six months because of its grassroots work, its small creative and collective insubordination, while its failure happened due to the weakness of the international insubordinations, which were incapable of solidarity. In short, with the Oaxaca teachers, we can learn the creative potential of a new society, that insubordination can enable humanity, and how much these insubordinations do not necessarily have to be linked to classroom practices.

HIGH SCHOOL STUDENTS AGAINST THE REORGANISATION OF PUBLIC EDUCATION IN SÃO PAULO (2015)

When we adopt the understanding of creative insubordination as ethical acts, we understand that they do not need to start from teachers or the strongest links of oppressive relations in favour of "weak minorities." The richness of creative insubordination in education manifests itself more constructively and critically when it is constituted by the collective acts of the self-defending minorities when students, and not teachers, become insubordinate. The high school students' movement in the state of São Paulo against the reorganisation of public education in 2015 demonstrates this.

In the middle of the second half of 2015, the then Governor Geraldo Alckmin (PSDB) announced the restructuring projects of public education that

would close at least 94 schools, end shifts and classes in others, and eventually reach three million children and adolescents. The reorganisation would eventually move around 200,000 students, distancing them from their communities and was characterised by trying to weaken links between school and community. On that occasion, high school students started a movement to occupy schools in over 200 occupations. Various student occupations launched manifestoes to justify the occupations, which demonstrated the critical depth with which they fought against the bureaucracy of public education. According to the occupiers,

this project [that] will further precariously improve the situation of public education in São Paulo, increasing the number of students per room and taking away the right to choose the most accessible place to study. In addition, we are in favour of an education project constructed in conjunction with the school community, as opposed to the authoritarian and excluding model that the rulers practice. (Palavra, 2015)¹

In addition, they argued that the current educational model would be alienating and linked to the formation of cheap labour for the market, while they called for union movements with servants, teachers, and the general community advocating the social importance of quality schools. Solidarity became an essential axis of the occupations, and parents abandoned their jobs to assist in the production of food and the organisation of cleaning.

The students' strategies were picket lines, barricades, and community awareness labour. They were organised in the schools, bringing food and organising groups responsible for cleaning the space, with shifts for the security of the collective that occupied the school. More than that, the occupation had pedagogical characteristics that were expressed in practice better than any theory; they were interdisciplinary or transdisciplinary without wanting to be. The educational activities were linked to theatre groups (Palavra, 2015b), discussions about the reorganisation, and the importance of the school. Several teachers joined the movement and began deep reflections on large-scale evaluative models and their links to reorganisation and a business school model (Maciel & Oliveira, 2015).

The movement emerged victorious, with the state government revoking the measure, leaving crucial learning for the student and social movements: the most important social movement of recent years coming from adolescents and

¹ Free translation of a direct quote.

not adults. And the insubordination of occupations created models of pedagogical practice that proved incapable of being realised within the school bureaucracy. In short, the student movement of 2015 showed that insubordination is only creative if they are collective, and consequent if they create interpersonal ties that disclose bourgeois individualism: solidarity, mutual support, direct democracy, and anti-bureaucracy, among others.

However, can creative insubordination be ethical acts that always transform into collective mass acts? The answer is no, and for this, we analyse the collective of maths teachers of a popular education project in Florianópolis, state of Santa Catarina.

THE MATH TEACHERS' COLLECTIVE OF THE POPULAR EDUCATION PROJECT (2011 - PRESENT TENSE)

The popular education project, called Projeto Integrar in Portuguese, was created in 2011 by a group of professors from a former community college entrance exam in Florianópolis, SC. Those teachers, all of them volunteers, brought with them the learning of other historical moments and the concern to build a project that disassociated from the traditional pre-university entrance examinations, trying to value and stimulate a critical look and solidary relations among all the participants of the project (Projeto Integrar, 2019). The target audience of the project are students who graduated from public schools, labourers, community leaders, black people, trans people, street people, those excluded and marginalised by education systems, and mainly excluded by the entrance exam.

Unlike most community pre-entrance exam schools, Projeto Integrar works in three educational and pedagogical dimensions: 1) resistance and struggle against the entrance exam contributing to the access to higher education of the marginalised and excluded sectors of society, 2) permanence in education top of that win the hand access through the collective organisation around the University Students Management Integration, called Gestus in Portuguese, where students critically discuss the ways and knowledge produced and systematised in the university from the standpoint of the labour class and marginalised populations, excluded and oppressed, and socially struggling for free, quality public education; 3) the dimension of teacher education with a critical eye to the teaching and learning processes.

This article will concentrate on this third dimension, being directly crossed by the other dimensions of the project and consists of the reflective expositions of the author of this article as a member of this collective of teachers. Usually, in the studies in which groups of teachers are analysed, each of the participants of the group is introduced. However, these reflections are particularly about the collective, therefore, we will not introduce individuals, i.e., the reflections will always be on the collective, and not on the singular parts of it since the collective is not a random group taken as the object of study, but an organic body of collective practice organised in the teaching of mathematics in the project and, therefore, articulated to what Boylan (2016) understands as being the socio-cultural dimensions and the relationship with others. The temporal cut of the reflections is about the experiences in 2017 and 2018.

The main field of activity of the collective as teachers are the pre-entrance exam college maths classes held by the project in three different spaces (two schools and an association of residents, all in central spaces for the marginalised populations). The actions of the collective of teachers are taken from the human frame with which they will act; in short, the question “What mathematics will we teach and how will we teach?” is directly linked with the answers to the questions “Who are our students?” “How have they come here?” and “What do they expect for the future?”

The selective process of these students differs from most other community pre-entrance exam schools, while they apply tests and knowledge tests and rank the candidates admitting the first ones, the Project Integrar cuts by income, race/ethnicity, social condition and gender identity, and calls sequence candidates for the interview with project teachers’ trios. The interview processes aim to humanise the selection process since the candidates are summoned to share their life experiences, challenges, desires, difficulties, and dreams. The interview does not have correct answers. It is the initial space of sharing and humanisation between students and teachers in the Integrar Project, that is, we seek, from the beginning of the process, to establish an ethical-critical stance between the project and the incoming students, while trying to show them that they are endowed with experiences that are respected within the scope of the project. This process of the candidates putting themselves to reflect on their experiences since the selection process is the fourth dimension that Boylan (2016) talks about: the relationship with themselves.

These are this collective of teachers’ students, how they got there, and their purpose when they come. It is with this perspective that the collective reflects on what contents to teach and how to teach them.

THE CRITIQUE OF CURRICULAR ORGANISATION BY FRONTS: FIRST SUBVERSIONS

One of the main breakthroughs is with the perspective of the front, where the maths contents are divided into blocks (for example, a curriculum block being Functions, Trigonometry, and Analytical Geometry, another block of Probability, Statistics, and Information Processing, and another block of Spatial and Flat Geometry, Ratio, Proportion, and Percentage) and each teacher is responsible for teaching a block of content the whole year without knowing what another teacher is doing (a system used by the traditional pre-entrance exam schools), and that refers to the capitalist division of labour for greater productivity and little critical learning.

Antagonising this fragmented model of mathematics teaching, from the concept of popular education, the collective subverted the traditional curricular organisation of the pre-university courses and adopt a sequential system of teaching, where each teacher (or double, trio of teachers) has autonomy over their class, but always in coordination with the planning of the teachers' collective carried out in the monthly/bimonthly pedagogical meetings.

That is, as opposed to a fragmented curriculum between different blocks of content, and in this sense, in the very fragmentation of teachers into individuals isolated from the collective to which they belong, we adopt collective planning, and for collectivity, articulating the first postulate of ethical acts, to resist any form of oppression and exclusion, and the second postulate, that refers to the search for collective practices so that it is possible to break with individualistic bourgeois morality.

THE THEMES AS CENTRAL TO COLLECTIVE INSUBORDINATION

Among the main objectives of the collective is the exposition of human mathematics, open to criticism, socially determined and determinant. Accordingly, the first classes are always focused on discussions with students about their relationship with mathematics and the views that they bring of it from their regular education. We also try to show them how, throughout history, maths is effectively marked by the social concretions to which the contents have emerged. One of the examples most used by the collective is the discussion of the relation between the Greek military expansionist regime of looting other

cultures (their material and intellectual riches) and the possibility of the Greeks' idleness due to the slave system with which they produced and reproduced their lives. That is, the abstract heels of mathematics consolidated by Greek society are marked by its slave regime and indiscriminate robberies of the cultures of others.

The concern of how to teach and what to teach is always present in the collective's pedagogical discussions, so it ended up elaborating a strategy that sought to find subjects that would enable critical learning of mathematical knowledge. One of the most valuable examples was the mathematical modelling of a company that must decide whether to launch a drug on the market or not.

The trigger of the social discussion was the news that a businessman had bought the rights of an important drug to treat AIDS and raised its prices abusively. In short, the mathematical modelling processes sought to decide whether a drug should be launched. For the constitution of the steps of the modelling process, two disjointed criteria were adopted, which were directed to different resolution paths. The first one was the standpoint of a large corporation that sought a profit of 30%, and the other was the criterion of viability and social necessity. Adopting the first criterion, the answer for the problem would be negative, as the profit margin would not reach 30%, remaining around 20%. The second criterion showed that the sale of the drugs would pay the expenses of their production and research; given the social necessity, it could and should be launched on the market.

With this characteristic example, which was used at various other times to discuss quotas in higher education, black genocide, femicide, fraud of the deficit of social security in Brazil, etc., the collective sought to undermine what Skovsmose (2001) called the ideology of certainty, while defend was the maxim that in material reality, social and political whole mathematical equation is a political and ideological choice. In this way, we discussed the daily uses of mathematics to deepen exploration, to justify the withdrawal of historically conquered rights in scientific narratives that seek to affirm the superiority of a particular culture or ethnicity, among other things.

The main objective of the teachers' collective was not that all fully learned mathematics or that it was beautiful, and enjoyable, although they were important and mediating questions in the teaching-learning process. The real objective was for mathematics to cease to be an instrument of exploitation and domination of the capitalist, racist and sexist classes and to become instruments of resistance and human emancipation for our students in their daily social

struggles. Therefore, the collective of mathematics teachers made an ethical commitment (Radford & Roth, 2011) to the socio-political interests of students.

A SUBVERSIVE DIDACTIC-PEDAGOGICAL PROPOSAL

It is guided by the objectives previously expressed that the teachers' collective sought to base a didactic-pedagogical perspective of their own that was in line with the demands of the Integrar Project. Paulo Freire (1987) and Dermeval Saviani (2018), two of the leading theorists of Brazilian education, are the main influences. Freire is responsible for criticising an education that excluded the working, oppressed, and exploited classes from the process of humanisation, problematizing the teaching-learning processes. Saviani contributes to a critique of the pedagogies that came to improve the teaching of the school of the ruling class and to make working-class schools more precarious.

As the proposal of the collective's mathematics teaching is based on one side's interest in problematizing mathematics as a science of truth, whereas the other side wants to subvert its uses and knowledge in favour of anti-oppression and anti-exploitation, the themes are constructed as a central question pedagogical proposal. However, in the Freirean perspective, the themes are not broad and are not chosen randomly by the educators, but they need to have a present relation in the students' daily lives, and more precisely, when in coherence with an anti-oppression perspective, it must be born of a contradiction social life experienced by the collective. It is from this perspective that we previously presented the theme of AIDS, medicines, and the pharmaceutical industry.

On the other hand, while popular knowledge is fundamental to constructing a critical mathematical knowledge of the reality in which one lives, the teachers' collective came to understand that the discussion of the theme brings the need for an instrumentalisation space geared to school mathematics. That is, for the teachers' collective, there is an understanding that neither popular mathematical knowledge should be overestimated to the detriment of schoolchildren, much less the opposite.

It is from this perspective that inspired by the didactic steps of Saviani, but also the subvert in favour of the interests of the collective, which is built a minimal guideline for the sequences of teaching. According to this sequence

constructed and elaborated by the teachers' collective, five moments were instituted: 1) initial problematization of the theme, 2) conceptualisation and construction of the questions on the theme, 3) instrumentalisation, 4) synthesis and 5) final social practice.

In the initial problematization, the popular knowledge involved in the theme is mapped, always seeking to awaken the students' experiences about that theme, their opinions and feelings, among others. These first steps enable us to conceptualise the sequence that seeks to consolidate what is established as the main problem regarding the subject to be answered. Then, in mediation with the teacher, we can map the school mathematics knowledge necessary for constructing knowledge that goes beyond common sense. This stage establishes the school mathematical knowledge necessary to better understand the theme. The third moment of the didactic-pedagogical proposal is instrumentalisation. At this moment, students should be given mathematical instruments so that they can better understand the theme and problem outlined above. To achieve this goal, one can make use of traditional models of mathematics teaching, provided they are always consistent with the purpose of the subject, i.e., the question of the subject must always be present as a guideline. The collective understands that instrumentalisation is necessary for school mathematics, since its assimilation requires the mastery of the mathematical language to construct mathematical concepts, which can, by their generalised character, serve other problems or themes of everyday life different from the one that is being particularly treated.

The fourth moment consists of returning to the initial problem and the question delineated in the first two moments. Then, they must answer the question or problematize it in higher levels of discussion. Let us think about the previous example of the modelling of medicine, in which we tried to confront different perspectives and how mathematics influenced the choices previously made by those in power. That is, it is at the moment of synthesis that, on one side, the learner is confronted with the real intentions behind the themes that he/she discusses and is instrumented so that he/she can propose an alternative giving indications of the last moment: the final social practice.

The final social practice, or simply final praxis, is the moment that seeks to consolidate the didactic-pedagogical sequence in terms of ethical acts, since it seeks to encourage the students in an activity of contestation, of collective movement, and for the community.

CREATIVE E COLLECTIVE INSUBORDINATION IS EMBRACING OUR MISTAKES

Not everything is flowers in creative insubordination. The collective has made many mistakes and faced many difficulties. Among the main mistakes was to assume that the important topics for teachers would be the most important for our students, the conflict between the students' goals from an alienated view of traditional and content pre-college entrance exams (and their respective mathematics teaching) and the project's educational objectives and the collective of teachers who teach mathematics. Some students questioned when the teachers' group would teach "math classes" because, for them, what the teachers were imparting was "not a math class"; they were concerned with not "going over" the mathematical content. That is, they found it difficult to understand the project proposal initially.

Nevertheless, a statement always returns to all difficulties and resounds as an apprenticeship to any educator who can be frustrated by such resistances: everything is a process! This statement was always present during the project teachers' meetings when they shared their frustrations and yearnings. It could not be more correct, it is all a process, one must be resilient, patient, it takes a village to help students understand the project proposal and the collective of teachers who teach math.

One issue is that the teachers who participate in the collective find it hard to make a living because they are volunteers, and their salaries come from other teaching sources. Not infrequently, tiredness, frustrations, and anxieties alienated teachers from the collective, but, at the same time, the collective always showed itself as an instrument of encouragement and hope in everyday teaching practices.

Through these collective experiences of this collective of teachers, in labours linked to a small project in the city of Florianópolis, we can affirm that creative and collective insubordination does not need to ascend to a mass movement to be socially effective. This group of teachers who teach mathematics demonstrate that the force of creative insubordination is in the collective organisation of its members, since the ethical acts that seek to be effective for the needs of the human race in capitalist society will always face direct resistance (such as political persecution) and indirect resistance (such as the maintenance of singular life, fatigue), and are the overcoming of the antinomy between individual and society, in organised collectives, that allow the continuation of creative insubordination.

SOME CLOSING WORDS ON CREATIVE AND COLLECTIVE INSUBORDINATION (CCI)

With the analysis of the experiences and the theoretical development of the CCIs as ethical acts, we can understand the importance of collectivity in insubordinate processes in mathematics education, reaffirming the role of the collective as exposed by Radford (2012; 2014). Ethics is not simply a set of ideal precepts that the insubordinates assume for themselves in their individual acts in favour of the oppressed and exploited groups; it is effectively the establishment of social relations, of mediations, that seeks to break in practice with the reifying processes of capitalist society and which prevent the full ethical realisation of humanity.

With the Oaxaca teachers we have learned that not all processes of creative insubordination need to be in classrooms or schools, on the contrary, that the real creations of these insubordinations must break walls, seeking the streets, the community, and the broader aspirations of the populations exploited and oppressed. The high schools of Sao Paulo learned that ethical acts of creative insubordinate do not need teachers only, but that they can and should open enough so that the students can defy the school status quo, education, and capitalist society itself. Moreover, at the same time, the collective of teachers who teach mathematics in a popular education project in Florianópolis teaches us that creative and collective insubordination does not need to be great mass movements, but rather the incessant work of small collectives on the social bases of cities and the countryside.

That is, in addition to the collective relationships between individuals as the field of mathematical education already understood ethics, with our analyses, we show the importance of these relationships being linked to an alternative society conception, articulated with a broader ethical-political strategy than just the classrooms. In short, a dialectical understanding between the particular and the universal regarding the Social Being.

But let the main learning of all the reflections and analyses of this article be maintained: insubordination is only creative, and creations are only insubordinate if they are ethical acts, that is, collective.

DATA AVAILABILITY STATEMENT

Data sharing does not apply to this work, as no new data was created or analysed in this study.

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