

In between feminisms and contradictions and inventions and mathematics education

Bruna Letícia Nunes Viana, Universidade Federal de Mato Grosso do Sul,

✉ brunanunes.v@gmail.com

João Ricardo Viola dos Santos, Universidade Federal de Mato Grosso do Sul

In this paper, we come up with some problems and discussion related to feminism, contradiction, inventions and mathematics educations. Our attempt is to create some sparkles/contradictions/questions without answers through hypotheses in which mathematical ideas are discussed. In this sense, using/producing identity categories is still an obstacle (sometimes necessary) for research that falls within these paths. The mathematics, in many ways, is identity. Maybe the institutionalized mathematics is the big bad guy to feminisms studies in mathematics education. Feminism could be a political strategy not to deal with research problems of mathematics education, but a possibility to produce relationalities beyond the binaries. It is necessary and urgent to produce others mathematics.

Introduction

This essay is created from a doctoral research project by the first author, which is being supervised by the second author, in the Graduate Program in Mathematics Education, at the Federal University of Mato Grosso do Sul, Brazil. In our research project, we intend to articulate some feminist discussions with the field of mathematics education, given the importance of the theme and the scarcity of these studies, although we may find some research on gender and mathematics education.

As part of our research process, we weave some questions, as the ones below, but also the questions that will be made throughout this article, which constitute tensions that move us throughout this project. The questions are the following: Is opting for a feminism that fights for equality among women and men a way for scenes of gender violence not to happen? Is it possible that feminism is just a binary issue of gender (male and female), disconnected from other aspects such as class, race, sexuality, etc.? How the training courses for teachers in mathematics (teachers, employees, students, curriculum, physical structure, etc.) positions them in face of gender issues and their intersectionality (class, race, sexuality, ...)? What movements are formed within these courses on these issues?

Here, a first explanation is required on how we see these studies. We strongly believe that current feminist studies and gender studies have a lot in common, but they are distinct from each other.

Please cite as: Viana, B. L. N., & dos Santos, J. R. V. (2021). In between feminisms and contradictions and inventions and mathematics education. In D. Kollosche (Ed.), *Exploring new ways to connect: Proceedings of the Eleventh International Mathematics Education and Society Conference* (Vol. 3, pp. 1043–1052). Tredition. <https://doi.org/10.5281/zenodo.5416871>

On the one hand, gender studies focus more on differences in performance in math activities between men and women, or on denouncing women's characterizations in a way inferior to men, or even on explanations of how there is a process of exclusion of women in mathematics situations in relation to men. On the other hand, feminist studies tend to explore other issues, such as: the superficial binaries between sex/gender; the uses of mathematics that operate in the logic of the excluded third and thereby strengthen relations of exclusion, domination and patriarchy; violence and exclusion, even if in subliminal forms, that occur in school spaces or in the formation of mathematics teachers¹.

One of the reasons for making this distinction is the studies of the so-called third wave of feminism as an invitation to think about feminist studies beyond the idea of identity that the very notion of gender evokes (Hollanda, 2019), encompassing aspects such as technology and nature, that may (or may not) go through gender issues.

Feminist philosopher Donna Haraway (2000) endorses this idea in her text 'Cyborg Manifesto: science, technology and socialist feminism in the late twentieth century'. She uses the idea of the cyborg – a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as fiction – to say that, instead of operating through categories (even and mainly gender), we must surrender to the 'pleasure of the confusion of borders, as well as in favor of responsibility in its construction' (p. 37). Also according to the author, 'the cyborg is a creature of a post-gender world: he has no commitment to bisexuality, to pre-Oedipal symbiosis, to non-alienated work' (p. 38), and as he is ours ontology, its philosophy must be embraced.

We agree with Butler (2011), when she tells us that

Obviously, the political task is not to refuse representational politics – as if we could. The juridical structures of language and politics constitute the contemporary field of power; hence, there is no position outside this field, but only a critical genealogy of its own legitimating practices. As such, the critical point of departure is the historical present, as Marx put it. And *the task is to formulate within this constituted frame a critique of the categories of identity that contemporary juridical structures engender, naturalize, and immobilize.* (Butler, 2011, p. 8)

Currently, feminist movements in our society are varied, different and even contradictory, and a series of adjectives and radicals appear together with the word feminism to designate different movements: black feminism, decolonial feminism, radical feminism, transfeminism, etc.

Just to highlight one of these movements, and some of its developments, we mention black feminism, which, according to Haider (2019) had one of its most influential texts, 'A Black Feminist Statement', created by a group of black lesbian activists formed in Boston named Combahee River Collective (CRC). These militants were dissatisfied with the ongoing revolutionary socialism project, arguing that it had been corrupted by Racism and Sexism on the Left. This movement was one of the precursors of the idea of intersectionality, an idea that also permeates decolonial feminism. (Hollanda, 2019).

¹ This is a deepening point for our project as a whole. We emphasize that gender studies and mathematics education and feminist studies and mathematics education are not concurrent or even contradictory. However, these works may focus and be structured in ways that differ in some aspects, and this fact may be interesting for our research.

In between feminisms and contradictions and inventions and mathematics education

One of the contradictions of feminist movements is that presented by feminists who criticize those dedicated to gender studies, as they understand that this denomination of gender studies hides the one who is the true subject/object of studies, the woman, since this is usually denied or marginalized by an androcentric culture. (Louro, 1995). We question ourselves, by looking at this contradiction, whether taking 'the woman' as a unit of analysis (and here we also question whether this is possible) would not be to reinforce the power structures through which violence is perpetuated.

Despite the differences and contradictions, we agree with Haraway (1995) when he argues that 'There is no single feminist point of view because our maps require too many dimensions for this metaphor to serve to fix our views' (p. 32), but that perhaps is the search for other explanations of the world.

In this scenario, in this paper we problematize three situations, with the production of problems in naturalized situations of our everyday life. We produced some sparkles/contradictions/questions without answers. Our intention is to bring these questions to try to produce some ways to make another mathematics education, beyond the process of teaching and learning mathematics, maybe as a political-pedagogical strategy to invent other relationalities and other schools. Mathematics Education, always in plural, as a possibility to problematize central discussions/tensions in our society, such feminism, is vital.

We will show three scenarios in which we discuss some feminist statements, specifically the feminism that commented before. With all this narrative we produce some problems to Mathematics Education research, specifically, our research work.

Machismo mata, feminismo salva



Figure 1: A poster during a protest (RUA, 2020)

This photograph was taken from RUA (2020) at a protest in Brazil, in which women took to the streets to ask for justice in a possible case of rape by a social influencer². We will not go deep into this case, which certainly deserves to be discussed carefully, but rather we will take

² For further information about this case, see <https://theintercept.com/2020/11/03/influencer-mariana-ferrer-estupro-culposo>.

a look at the possibility of production with the words contained in the poster wielded by one of these protesters: MACHISMO MATA. FEMINISMO SALVA!

Surprisingly, in the process of producing this article, we came across a linguistic barrier: the lack of a translation for the word *machismo* in the English language. In Portuguese, our native language, the word has different uses and meanings, and it is part of our daily lives in such an extent that its definition is often unnecessary. Looking for similar words or expressions, in the English language, we come across the expressions *male chauvinism* and *sexism*.

Guttman (2013) conducted a study whose objective was to study the history of the terms *macho* and *machismo*, since, according to the author, these terms have many discrepancies in relation to their uses in Social Sciences. Among the author's notes, is that 'machismo under discussion here cannot be reduced to a coherent set of sexist ideas; it is not mere male chauvinism.' (Gutmann, 2013, p. 72)

Far from wanting to arrive at a definition of the word 'machismo', we can understand it, for the purposes of this article, as a process in which men and women, with marked identities, build themselves in affections that promote patriarchy, hierarchization and a submission between them. We may see this process happening from culturally accepted affections, unfortunately for a long time, until today, such as in small sentences, actions, clothes, movie scenes, excerpts from books and why not, also in mathematics and in the educational spaces in which it is worked. We believe that this understanding meets the understanding described in the excerpt below.

a system of representations-domination that uses the argument of sex, thus mystifying the relations between men and women, reducing them to hierarchical sexes, divided into dominant pole and dominated pole that confirm each other in a situation of objects. [...]. Thus, machismo represents (articulates real and imaginary relationships) this domination of men over women in society. (Drumont, 1980, p. 82, our translation)

A natural tendency, with this in sight, is to identify (again, by operating in the logic of identification) *machismo* as the villain, since patriarchy, hierarchization and submission of women to men are associated with it. This can be seen in the phrase *machismo* kills, which could have many different interpretations: *machismo* can literally kill,³ but it also, in a metaphorical way, kills opportunities, freedom, equal rights, dignity, both men and women.

Thus, feminism seems to be a salvation (feminism saves) in a context in which machismo presents itself as a villain. In other words, from all the violence (physical-mental) caused by machismo and that constitutes our society, electing a movement (in this case, feminism) to save everyone seems to be the only possible path. Apparently, we keep operating in the logic of identification: we identify a problem-villain (machismo) and also a salvation (feminism), as suggested in the poster.

When considering this issue, we ask ourselves: will feminism, in different configurations, be able to solve our problems? Wouldn't identifying a villain and pointing out salvation be to continue operating in a patriarchal logic of the world?

³ Here in Brazil, in the year 2020, about five women were killed a day from femicide.

An exemplary example in a teacher training course in mathematics

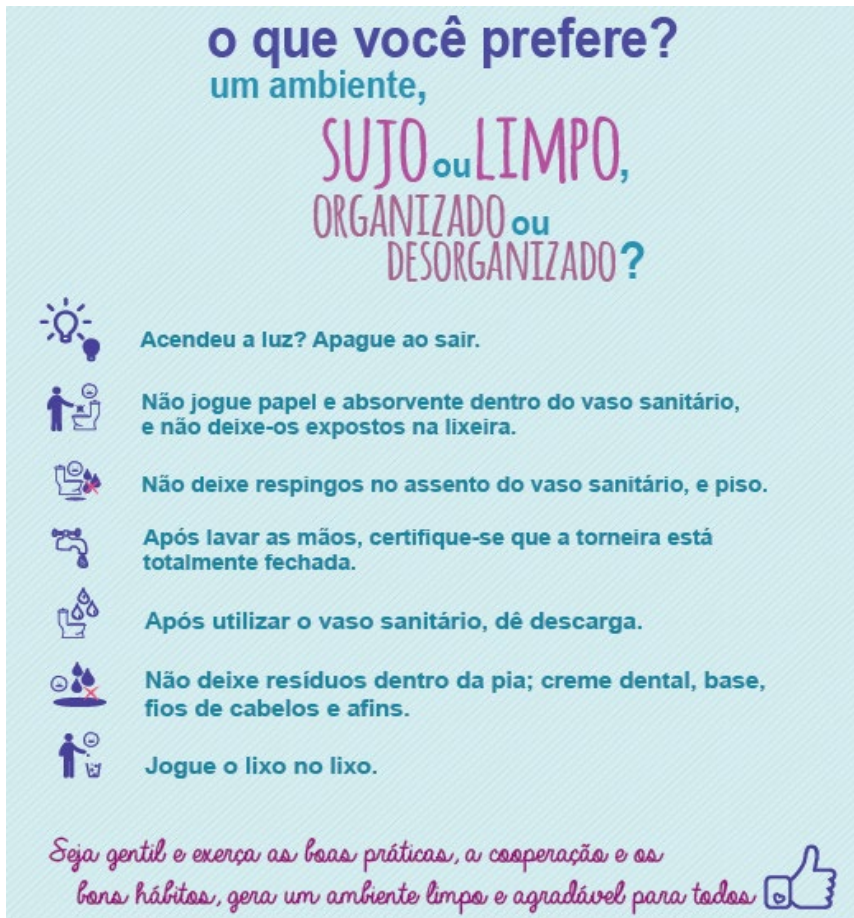


Figure 2: A poster found in a women's bathroom

The poster in Figure 2 was in the women's bathroom at the Institute of Mathematics, Federal University of Mato Grosso do Sul, the university where the Graduate Program in Mathematics Education of which we are part is located. We chose to bring the photo of the poster in its original version, and then its transcript as follows:

What do you prefer? A dirty or clean, organized or disorganized environment? Have you turned on the light? Turn off when exiting. / Do not throw paper and tampons into the toilet and do not leave them exposed in the trash. / Do not leave splashes on the toilet seat and floor. / After washing your hands, make sure that the tap is completely closed. / After using the toilet, flush. / Do not leave residues inside the sink: toothpaste, makeup, hair strands, etc. / Throw trash in the trash. / Be kind and act good practices, cooperation and good habits, it generates a clean and pleasant environment for everyone. (Our translation of the poster text)

The statements of this pamphlet placed in the women's bathroom, which apparently intend to 'kindness and good practices', can be unfolded in some questions: who put that paper there? Is there a paper in the men's bathroom that gives tips on how to be kind and exercise good practices, or is this an exclusive recommendation for women? Why leaving an absorbent exposed in a trash can is a practice that must be watched over? Does this have anything to do with the process of erasing menstruation, which, as pointed out by Louro (1999), is also related to the erasure of women's sexuality in school environments? What intra-actions does this pamphlet operate on math teachers and future math teachers? How do these bodies resist?

These questions are configured as possible tensions of how practices that exclude and that hierarchize bodies are subtly imposed on our daily actions. It is not surprising that some people argue that these statements do not address issues of gender and patriarchy and that they are only suggestions for maintaining the hygiene of the women's bathroom and the personal hygiene of women.

At the XIV SESEMAT (Seminário Sul-mato-grossense de Educação Matemática), held in a virtual environment at the Federal University of Mato Grosso do Sul, we presented our research project, and as part of the presentation, we exposed the photograph of the pamphlet of the bathroom and the previous questions.⁴

Surprisingly, one of those responsible for creating and fixing the pamphlet in the women's bathroom, a student in the Bachelor's and Mathematics course, was present during this presentation. She asked the floor, at the end, to tell us that she had no idea that the pamphlet had a sexist aspect – a conclusion she drew by herself after seeing the presentation – and that she was concerned to see how a simple pamphlet could interfere and produce specific ways of being in the world. In addition, she went on to tell us that the pamphlet was designed based on constant complaints that some employees of the cleaning sector of the building made, which involved the items they listed in the pamphlet, such as the use of makeup, and of the tampons exposed in the trash.

This example is exemplary because it involves a tangle of questions that, due to the complexity of each one of them, run the risk of being analyzed in a simplistic way, such as our initial inclination when asking questions in our research project. In this tangle, there are gender issues, such as the issues that were raised, but also issues of social class, since the demand was from the cleaning employees themselves, who felt that something could be done to help them in their daily tasks. On the other hand, there is also a structural *machismo* that makes us naturalize certain habits, such as hiding menstruation, and, because it is structural, it crosses everyone who is part of the daily life of this course, and it would be interesting to discuss.

This poster leads us to ask the following questions: how can we lead discussions that do not fall into the trap of a simplistic analysis of complex issues? How could we create questions that problematize practices taken as natural (in this case, the erasure of menstruation) and

⁴ For further information on this paper presentation, see Viana (2020a).

In between feminisms and contradictions and inventions and mathematics education that produce violence in the bodies of future mathematics teachers? How to create questions that do not claim specific and fixed ways of doing research? How to create questions without the means to do so? Feminism is (or could be) a thematic research of mathematics education?

Paradoxes

3. As crianças dos terceiros anos participaram de uma pesquisa sobre as frutas que mais gostam e fizeram uma lista.

Em seguida, a professora pediu para os alunos escreverem as informações em uma tabela. Vamos ajudá-los a completar.

FRUTAS TOTAL
 Uva = 50
 Banana = 40
 Melância = 25
 Abacaxi = 10





Frutas	Meninas	Meninos	total
 MELANCIA		12	
 ABACAXI	7		10
 UVA	20	30	
 BANANA		20	40

Figure 3: A 'math' exercise

The exercise above is a 'math' activity prepared for children aged 8 and 9. The statement says: 'Third-year children participated in a survey on the fruits they like best and made a list. Then, the teacher asked the students to write the information on a table. We will help them to complete it'. Right after the statement, we can see a small table with the names of some fruits, followed by the total amount. The fruits in the order they appear in this small table are: grape = 50, banana = 40, watermelon = 25, pineapple = 10. In the larger table, in the first column, the fruits are described in the following order: watermelon, pineapple, grape and banana. The second column, whose title is girls, tells us that 7 girls opted for pineapple and 20 girls opted for grapes. In the third column, which is the boys' column, 12 boys opted for watermelon, 30 boys opted for grapes and 20 boys opted for bananas. The fourth and last column is the column that indicates the total number of students in each row of the table.

In this simple math exercise, there is a process of constituting binary identities - male and female - and simply erasing other possibilities. It is an activity proposed for children between 8 and 9 years old, apparently without any kind of prejudice. However, there is a veiled process of binarization established in a mathematical problem. By setting girls and boys as a category of analysis, it is being admitted that in the world there are only boys and girls, categories that possibly were determined by biological characteristics.

Following the paradox in this situation: on the one hand, the political importance of constituting identities (in this case, men and women), since in this way we managed to fight for more representativeness of a class that has historically been subjugated to another. Speaking more directly, women or the woman category must first exist in order for their claims to be heard. In our case, some of these claims are for more equal wages, valuing jobs that (purposely or not) are unpaid and are seen as female (maternity, domestic services, care, among others), linguistic issues (in Portuguese we face some problems because it is a binary language), etc.

On the other side of this paradox, there is the implication that, by establishing an identity, we are leaving out subjects, and with this, we are promoting new processes of exclusion. What some feminist movements have done is to fight for an expansion of the attributes that guide these identities; however, there are still minimum characteristics that need to be met so that the subjects themselves can claim this expansion, which feeds into the paradox.

In this sense, the book 'Gender Relations, Mathematics Education and Discourse' (Souza & Fonseca, 2010) dedicates a chapter in discussing an identity issue that we consider urgent, although it is not within the scope of our studies: how a male superiority for mathematics is built in and by the school. According to the authors,

Confessions of 'embarrassments' and announcements of 'behaving' refer to ways of 'being a woman' and 'being a man' in our society. Such 'embarrassments' and 'behaving' are publicized in the media. They appear in multiple practices of women and men, becoming the subject of anecdotes, and they are in bar conversations, they are on truck bumpers, in string literature, in soap operas, television, on the internet, in advertisements... and at school! Finally, 'reason' (to which 'Mathematics' would be linked) is proclaimed in prose and verse as masculine; and unreason (which separates and moves away from 'Mathematics') is characterized as feminine. (Souza & Fonseca, 2010, p. 14, our translation).

We understand that fighting for representation is an operational term within a political process that seeks to extend visibility and legitimacy to women as political subjects. The representation is the normative function of a language that would reveal or distort what is considered true about the category of women.

When we look again at Figure 3, we see an example of this argument: it is important that we talk about the category of women, especially in situations where we need to guarantee their rights, but in a mathematical exercise whose objective seems to us to be the organization of data in a table, using men and women as the category of analysis for these data. It seems to feed the idea that men and women are naturally different, even when choosing a fruit of their choice.

In between feminisms and contradictions and inventions and mathematics education

We cannot fail to mention that behind this representation/identification policy there is a psychoanalytic desire for the maintenance of these structures. It is worth remembering that the search for identity is not an inherent characteristic of the human being, but, on the contrary, they are 'socially instituted and maintained norms of intelligibility' (Butler, 2011, p. 23) for the very maintenance of the concept of identity.

Therefore, we ask ourselves: Is it possible the existence of a mathematics education without a subject? What about if we consider feminism as a political strategy to constitute new math class, in which the idea of identity is replaced from the center of the educational process? Maybe, the invention is a possibility.

Some room to produce a feminist mathematics education

Firstly, it is not a question of building a research school or a theory in the midst of discussions of mathematics education, such as, for example, of Critical Mathematics Education. Nor is it about compartmentalizing feminist studies among those who study feminism and its relations with mathematics education, as what happened with Inclusion Mathematics Education group, specifically in Brazil. In our view, it is a possibility to produce ground, spaces, material and discursive practices by which we can talk about hierarchization, binarism, patriarchy, and exclusion/inclusion could be problematized in a mathematics education.

On the one hand, we think is necessary to bring the representation idea to, for instance, deal with the boys and girls mathematics exercises. On the other hand, we think is necessary to produce new concepts beyond the binary, including mathematical concepts to work with the students. These concepts can be produced in the classroom, by teachers, but also by students if these issues and concerns are problematized with them.

In this sense, it seems powerful to use the exercise contained in Figure 3 to trigger a classroom discussion about the need of dividing the table into boys and girls. Questions could be asked to the children and then adding other columns to the table. This exercise could also be brought into a teacher training course to discuss how some exercises emphasize some normative divisions of language, which hide processes that produce differences between men and women.

Another possibility is to label the columns of the table in Figure 3 – instead of the man and the women' categories presented – the 'humans, non-humans and others' categories. What would the children respond to that? Are there some differences between these three columns? What is 'others'? Is it possible to work this with children of 8 and 9 years old? Why not?

Perhaps, in spaces where discussions like these were held, posters like the ones in Figure 2 would not make sense, as the bathrooms would also be divided into the categories 'humans', 'non-humans' and 'others'. And the claims in Figure 1 could also be somehow shifted to make room for new claims for a world structured around these other categories.

Thus, operating with discussions between feminism and contradictions and inventions and mathematical education can be a political strategy to affect the relations between humans, non-humans and others in our contemporary society, as the possibilities presented above.

In conclusion, here we bring some final questions: how institutionalized mathematics in teacher training courses corroborate with this ideal of the Enlightenment Man, leaving women out once again? In what way are colonialities (and their intersectionalities) and their resistances played out by teachers, employees, students and other people who are involved in this course? *Machismo* kills and feminism saves? Is representation an obstacle for feminist studies in mathematics education? Does mathematics constitute an obstacle for feminist studies in mathematics education? (Viana, 2020b)

All these questions bring some possibilities to think about feminism and mathematics education. It isn't questions looking for answers, but just statements for beyond questions and answers. They are statements which proclaim inventions, as the ones suggested above.

If we let ourselves think about feminisms and contradictions and inventions and mathematics educations through symptoms and not problems, one possibility is to ask questions as a process of theorization. A research movement that produces with what is yet to come. Maybe, feminism with a political strategy isn't meant to deal with research problems of mathematics education, but a possibility to produce other relations between human and non-humans, relationships beyond binaries. Maybe it is necessary and urgent to produce other mathematics.

References

- Butler, J. (2013). *Problemas de gênero: Feminismo e subversão de identidade*. Civilização Brasileira.
- Drumont, M. P. (1980). Elementos para uma análise do machismo. *Perspectivas: Revista de Ciências Sociais*, 3, 81–85.
- Gutmann, M. (2013). O machismo. *Antropolítica: Revista Contemporânea de Antropologia*, (34), 69–91.
- Haider, A. (2019). *Armadilha da identidade*. Veneta.
- Haraway, D. (1995). Saberes localizados: a questão da ciência para o feminismo e o privilégio da perspectiva parcial. *Cadernos pagu*, (5), 7–41.
- Haraway, D. (2000). Manifesto ciborgue: Ciência, tecnologia e feminismo-socialista no final do século XX. In T. Tadeu (Ed.), *Antropologia do ciborgue: As vertigens do pós humano* (pp. 35–118). Autêntica Editora.
- Hollanda, H. B. (Ed.). (2019). *Pensamento feminista: Conceitos fundamentais*. Bazar do Tempo.
- Louro, G. L. (1995). Gênero, história e educação: Construção e desconstrução. *Educação & Realidade*, 20(2), 101–132.
- Louro, G. L. (1999). Pedagogias da sexualidade. In G. L. Louro (Ed.), *O corpo educado: Pedagogias da sexualidade* (4th ed., pp. 7–34). Autêntica Editora.
- Preciado, P. B. (2018). *Transfeminismo*. São Paulo: n-1 edições.
- RUA (2020). [a facebook post without title, written by a political group in Brazil named RUA]. RUA Juventude Anticapitalista. <https://www.facebook.com/ruajuventudeanticapitalista/photos/pcb.1728797740620828/1728797660620836/?type=3&theater>
- Souza, M. C. R. F., & Fonseca, M. C. F. R. (2010). *Relações de gênero, Educação Matemática e discurso*. Belo Horizonte: Autêntica editora.
- Viana, B. L. N. (2020a). Feminismo, educação matemática e formação docente: Investigações no lócus fraturado. *Anais do Seminário Sul-Mato-Grossense de Pesquisa em Educação Matemática*, 14(1), 647–648.
- Viana, B. L. N. (2020b). Feminismo e educação matemática: Traçando possibilidades. *Revista Internacional de Pesquisa em Educação Matemática*, 10(3), 70–83. <https://doi.org/10.37001/ripem.v10i3.2690>