

(RE)PRODUCTION OF KNOWLEDGE WITHIN MATHEMATICS EDUCATION

AN AESTHETIC AND VIOLENCE ISSUES

(RE)PRODUCCIÓN DE CONOCIMIENTO EN LA EDUCACIÓN MATEMÁTICA

Un problema de estética y de violencia

(RE)PRODUÇÃO DO CONHECIMENTO NA EDUCAÇÃO MATEMÁTICA

Uma questão de estética e violência

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ABSTRACT

This paper aims to discuss the production and reproduction of knowledge —such categories, notions, theories, and methodologies that are part of mathematics education research— drawn from an epistemic approach that pursues to disturb the supposed neutrality, objectivity, and order of our field. The paper's premise is shaped by the idea that searching for new ways of doing is plausible to make visible conditions of possibilities, in which new ways of thinking are traced to what we can and can't do in mathematics education. Premise framed in epistemological anarchism, here it argues that scientific progress could be restricted due to prescriptive scientific methods, as well as fixed and universal norms. The acknowledgment of diverse action flows and tools able to mould in order to respond to reality and context, it is understood as potency to think of new possibilities; along with this, to unpack and read the network rhizomatic entangled to look into teaching and learning of mathematics beyond the didactic triangle. In this fashion, diverse authors assert that the research is a political and power issue. The (re)production of knowledge is not neutral or innocent. The non-neutrality and innocent become possible since an aesthetic that circulates and normalizes what is considered as —valid and valuable— research, as well as the ways of doing and producing —valid and valuable— knowledge. This normalization generates events of violence, particularly against —epistemic or ontological— minorities.

Keywords: (re)production. knowledge. aesthetic. violence.

RESUMEN

Se propone discutir la producción y reproducción de conocimiento —las categorías, nociones, teorías y metodologías que emergen y fluyen en la investigación en educación matemática— desde una aproximación epistémica que rompe con la supuesta neutralidad, objetividad y orden de nuestro campo de estudio. La premisa que circula y direcciona este estudio se edifica sobre la idea que en la búsqueda de nuevas formas de hacer es plausible visibilizar condiciones de posibilidades, las cuales dan forma a nuevas formas de pensar lo que hacemos y no hacemos en el campo. Esta premisa se enmarca en el anarquismo

epistemológico, el cual sostiene que aquella ciencia que funciona de acuerdo con normas fijas y universales no es realista, además de ser perniciosa y perjudicial para su desarrollo. Es aquí donde el reconocer diferentes flujos de acción y herramientas capaces de adaptarse se ve como potencia para trazar nuevos caminos, junto con ello desempacar y leer el enjambre rizomático que se configura a la hora de pensar sobre la enseñanza y aprendizaje de las matemáticas más allá del triángulo didáctico. Se pone en relieve el hecho de que el conocimiento no es neutral ni inocente, dado que produce el lenguaje y herramientas con las cuales se da forma lo que se ve y se dice dentro del área. Por ello que diversos autores afirman que la investigación no es neutral, es política y es una cuestión de poder. La no neutralidad y la inocencia se vuelve posibles dado a una estética que circula y normaliza lo que se considera investigación válida y valiosa, así como las formas validas y valiosas de hacer y producir conocimiento. Esta normalización genera hechos de violencia, particularmente contra las minorías —epistémicas u ontológicas— que normalmente son invisibilizada por la academia.

Palabras clave: (re)producción. conocimiento. estética. violencia.

RESUMO

Este artigo tem como objetivo discutir a produção e reprodução do conhecimento —como categorias, noções, teorias e metodologias que fazem parte da pesquisa em educação matemática— a partir de uma abordagem epistêmica que busca perturbar a suposta neutralidade, objetividade e ordem de nosso campo. A premissa do artigo se constitui na ideia de que buscar novos modos de fazer torna plausível tornar visíveis condições de possibilidades, nas que moldam novas formas de pensar sobre o que fazemos e o que não fazemos no campo. Premissa enquadrada no anarquismo epistemológico, o qual argumenta-se que o progresso científico poderia ser restringido devido a métodos científicos prescritivos, bem como normas fixas e universais. O reconhecimento de diferentes fluxos de ação e ferramentas capazes de moldar para responder à realidade e ao contexto, é entendido como potência para pensar novas possibilidades; junto com isso, descompactar e ler a rede rizomática que fica emaranhada enquanto pensava o ensino e a aprendizagem da matemática além do triângulo didático. Assim, diversos autores afirmam que a pesquisa é uma questão política e de poder. A (re)produção do conhecimento não é neutra ou inocente. A não neutralidade e a inocência tornam-se possíveis a partir de uma estética que circula e normaliza o que se considera como pesquisa —válido e valioso—, bem como as formas de fazer e produzir conhecimento —válido e valioso—. Essa normalização gera eventos de violência, particularmente contra minorias —epistêmicas ou ontológicas—.

Palavras-chave: (re)produção. conhecimento. estética. violência.

A kind of introduction

This paper aims to discuss the production and reproduction of knowledge —such categories, notions, theories, and methodologies that are part of mathematics education research— drawn from an epistemic approach that pursues to disturb the supposed order neutrality, objectivity, and order of our field. This paper is framed in epistemological anarchism (Feyerabend, 1993). This understanding argues that scientific progress could be restricted due to prescriptive scientific methods, as well as fixed and universal norms. Even more, it proposes that anarchism will foster research progress and lead to new insights; here, the guiding principle is "anything goes". The challenger becomes in acknowledgment of such actions and flows able to mold in order to respond to reality and context in a way that we can trace new possibilities of thinking about and doing —line of flight— regarding the network rhizomatic entangled to look into teaching and learning of mathematics beyond the didactic triangle. Thus to "break with the alleged coherence or "order" of mathematics education" (Straehler-Pohl, Pais, & Bohlmann,

2017, p. 4). There is a relationship between the production and reproduction of knowledge, and such conditions of possibilities framed in, at the same time, shape, on the one hand, social, historical, political, and cultural issues; on the other hand, the network of social practices of mathematics education (Valero, 2012).

The knowledge, as well as its production and reproduction, is not neutral and innocent since this is a product of epistemological rationality. In this fashion, Darragh (2018) asserts diverse authors have established "that all research is non-neutral, is political and is about issues of identity and power" (p. 78). For example, Pais and Valero (2012) state that mathematics education research is not an innocent activity; due to the research produces languages and tools which shape what we see and say within mathematics education.

The circulation of dominant narratives —as well as of taken-for-granted truths— shapes a woven —network rhizomatic — in which our understanding and ways of thinking are normalized according to "rules and standards that police the boundaries of what is possible and not possible to think and to do— what is given as natural and common-sense that governs conduct and that simultaneously excludes and abjects" (Popkewitz, Diaz, & Kirchgasler, 2017, p. 3). Moreover, this woven is framed in positivist and neo-positivist discourses that lead to what is and is not considered as knowledge and science, the means of dissemination of such knowledge, and the institution —subjects and organizations— who can produce or promote it. The motto "publish or perish" greatly represents the narrative that normalizes and conducts the academy. Currently, the research searches to reduce the social practices and relations to binary ratings; for example, normal-pathological, good-bad, and high-low performance, among others. The binary ratings are an illusion of supposed order. It is no more than a fetishist expression (Zizek, 2004) of knowing —like researchers and mathematics educators— that things are not like we want and hope. However, we are part of the academy and strive to stay in it and enjoy its benefits. The becoming of subjects and social groups are moulded by forces that operate in rating and tagging the others regarding the gap between the desired and the reality.

A "grid of historical practices that makes the object of research possible to 'see' and act on" (Popkewitz, 2012). In this grid —configured in modern rationality— the mathematics education research has been based on making objective all aspects or layers implicated in the process of teaching and learning mathematics.

A "grid of historical practices that makes the object of research possible to 'see' and act on" (Popkewitz, 2012). In this grid —configured in modern rationality— the mathematics education research has been based on making objective all aspects or layers implicated in the process of teaching and learning mathematics. Regarding mathematics education research, Pais (2017) asserts that this is narcissistic, closed in itself, denying those matters that do not fit into its own image. Then, when mathematics education research.

confronted with obstacles to the teaching and learning of mathematics that cannot be controlled by research—poverty, inequality, economic constraints, and governmental decisions, but also students' refusal to assume the symbolic mandate conferred upon them—researchers tend to forsake them for the sake of research. Instead of conceiving these "external" circumstances as the very arena in which the true nature of research's inner potentials is to be "tested", researchers conceive them as empirical impediments, thus keeping the presuppositions of research intact (Pais, 2017, pp. 56-57).

In this narcissism, specific questions become awkward to the point of being excluded or not being considered as part of the concern of the field. It important to keep in mind

the expulsion of the Other sets in motion an entirely different process of destruction, namely that of self-destruction[...] It draws us into an endless ego loop, ultimately leading to an 'autopropaganda', indoctrinating us with our own ideas (Han, 2018. pp. 6-8).

Regarding the method

This paper self-defines as a territory in expansion. Here, it is pursued to expand and disrupt the canonic way of thinking and doing —methodologically and theoretically— in order to make possible new epistemes and not fall into what Niss (2018) called 'ideal-typical' research paper.

Although, in the field, there are experiences that have disrupted the normal. It is complex to find something different. Here are two examples: First, the Andrade-Molina's paper (2018) titled "Mindniac. The reasonable citizen of schooling (Chilean edition)". This paper draws a narrative from comics, a literary resource not used in scientific dissemination; Second, the plenary Cabral y Baldino conference in the tenth version of Mathematics Education and Society Conferences. This plenary was built on a narrative that entangled four voices, for it 2 participants of the conference, and the lectures embodied fictional subjects.

In this vein, the paper is raised from an epistemic position —epistemological anarchism— framed Against Method (Feyerabend, 1993). Moreover, it seeks to put into operation a tool-box from the theorization and discussion of aesthetics and violence. This way of operating is inspired by what Foucault (2001) asserts about his writings.

I would like my books to be a kind of *tool-box* in which others can search a tool with which they can do what they want in their field [...] I don't write for an audience, I write for users, not readers (Foucault 2001, pp. 523-524).

As well as by Deleuze (1995) proposes about his courses: "nobody took in everything, but everyone took what they needed or wanted, what they could use" (p. 139).

Regarding the method

During the past fifty years, what has been published under the label of mathematics education research constitutes a very broad, diverse and extensive body of contributions to the field[...] However, during the last three decades I have detected a gradually reduced spectrum of variation in the nature of 'mainstream' published research (Niss, 2018, p. 35).

It seems that exists a right way of doing research and (re)producing knowledge, which is shared by everyone and is common sense. This could justify the fact of finding the same kind of research over and over —the reduced spectrum of variation aforementioned—. It becomes relevant to problematize and disrupt how we are researching and (re)producing knowledge. Otherwise, our practices could be "detrimental and potentially dangerous to the development and future of our field" (Niss, 2018, p. 47). We need to think and find new ways of doing new problems and concerns that encourage the development of new understandings, practices, and knowledge. The (re)production of knowledge has been normalized from standardization and what is well accepted by the academy. It is here where the power operates, by governing researchers and mathematics educators through the establishment of what is considered valid, valuable, and quality, as well as what is possible to do.

If we consider aesthetics as the study of beauty and taste, as well as from Foucaultian ideas about the aesthetics of existence. The first questions that emerge are: What does make some knowledge will be considered valid, desired, and good (beauty)? How does become researcher and mathematics educator according to the practice of power that establishes the circulating idea of beauty? Here what is desired and feared are entangled in order to trace the criteria of beauty.

Desire "is understood as a primary active force rather than as a reactive response to unfulfilled need" (Patton, 2000, p. 70), which produces reality (Deleuze & Guattari, 1977). Following the idea of becoming (Deleuze & Guattari, 1994), it is possible to consider that desired knowledge is not what it is; rather, what it will become, what it is in the process of becoming. From the aesthetics of existence, the object of the work of the researcher is his/her life. Therefore, if the researcher separates of his/her

research, s/he will leave being a researcher. In other words, the process of research becomes co-extensive with the researcher's life.

Therefore, the aesthetics that make possible the (re)production of knowledge shape a territory in which certain notions and understanding circulate and are plausible. But, it is our responsibility to promote displacements from new actions and practices.

A kind of introduction

Despite various violent events regarding the (re)production of knowledge in the field, this issue has been little studied. Some works concerned with race and gender have argued and raised frameworks for thinking the violence. The violence seems to be related to marginalized subjects attacked at epistemic and oncologic levels. Indeed, this attack has ethical and political implications.

Violence is related to an action or actions' set where there is an aggressor (which could not always be related to a subject —the idea of Žižek about subjective and objective violence helps to off-center the focus on subjects) and a victim. However, circulating other kinds of violence. A violence more subtle which sometimes is beyond our reach. Due to the naturalization of practices and ways of understanding the world.

Violence must think beyond an action rather as a way of social relationships characterized by the negation of the other (Pacheco, 2016). Some kinds of violence take place gradually and noiselessly; in Nixon's (2011) words, slow violence.

Regarding (re)production of knowledge. The silencing of all that is considered different —or non-desired— is the expression more clear of violence. The subject is not only mistreated as an intelligible communicator but also by preventing the development of his/her voice, as well as the access to practices of (re)production of knowledge. Violence does not always imply the rejection of knowledge produced by marginalized subjects; in some cases, that knowledge is used but do not recognize as a product of who produces it. There is a hierarchy of multiple levels; the more privileged levels shape and promote an exclusive epistemology.

A kind of introduction

What I do claim is that the ideal-typical paper captures the essence of a highly predominant segment of published journal articles. I further claim that reviewers tend to strongly adhere to the template constituted by the ideal-typical paper and explicitly criticise papers that deviate from it. (Niss, 2019, p. 4)

Niss (2018) show us the emergence and circulation of 'ideal-typical' research paper. This paper is the product of the normalization and the establishment of codes that have the potency to lead how to do research, (re)produce knowledge, and disseminate it. Moreover, this kind of paper is a limited and rigid understanding of the research; it does not capture the multifaceted that could be the field, at the same time, could compromise the development and renewal of the field (Niss, 2018). However, there is little place in academy for doing something new.

Montecino (2021) asserts that it is necessary to question how we conceived knowledge production and turn it into a creative activity where the work of art and the act of resistance become one. The circulation of codes and discourses regarding what is acceptable, desired, and valuable seem that respond more to a tradition or ways of normalized doing —rationality—, which shapes and perpetuates an authority epistemic —the productive aspect of power—. Power “needs to be considered as a productive network which runs through the whole social body, much more than as a negative instance whose function is repression” (Foucault, 1980, p. 119), “power produces; it produces reality [...] The individual and the knowledge that may be gained of him belong to this production” (Foucault, 1991, p. 194). As Walshaw (2016) explains,

Foucault connects his notion of power-knowledge in a circular relation with ‘truth’. He links truth with systems of power that produce and sustain it and to effects of power which it induces and which extends it. (Walshaw, 2016, p. 50)

Then, power operates through the management of diverse kinds of freedom and the establishment of codes framed on regimes of knowledge and power. Regimes of knowledge established “who does and who does not have the intellectual authority to decide issues, how information should be gathered about who and by who, and the like” (Bevir, 1999, p. 66); and regimes of power shape “what counts as a meaningful utterance, what topics are to be investigated, how facts are to be produced, and the like[...] [A]ll regimes of power are constituted by discursive formations.” (Bevir, 1999, p. 66).

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