

BRAZILIAN CONTRIBUTIONS FOR DISCUSSIONS ON SOCIAL JUSTICE IN MATHEMATICS EDUCATION

CONTRIBUIÇÕES BRASILEIRAS PARA DISCUSSÕES SOBRE A JUSTIÇA SOCIAL NA EDUCAÇÃO EM MATEMÁTICA

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ABSTRACT

This paper presents some theoretical reflections on the discussions carried out in the articles of this issue. It aims to contribute to the discussions on social justice and mathematical education, a topic that has been debated nationally and internationally. A diverse panorama is presented from the articles produced by Brazilian researchers on the subject.

Keywords: Research; Mathematical Education; Social justice; Equity; Diversity.

RESUMO

Este texto apresenta algumas reflexões teóricas sobre as discussões realizadas nos artigos deste número temático. Tem como objetivo contribuir para as discussões sobre justiça social e educação matemática, tema que vem sendo debatido nacional e internacionalmente. Um panorama diversificado é apresentado a partir dos artigos produzidos por pesquisadores brasileiros sobre o assunto.

Palavras-chave: Pesquisa; Educação Matemática; Justiça Social; Equidade; Diversidade.

1. Introduction

The mathematics education movement in Brazil began in the 60's and intensified after 1988 with the creation of the Brazilian Society of Mathematics Education. Currently, the masters' and doctoral courses where researchers are trained in the area are found in all Brazilian regions, with a higher concentration in the states of the southeastern region.

The scientific production of educators Paulo Freire and Ubiratan D'Ambrosio have always influenced positively the training of researchers and the production of research

in Brazilian universities. The ideas of liberation of the oppressed, mathematics education for peace and the constant social and political movements challenge mathematics educators all the time whether in schools or in universities. The need to promote the formation of critical and supportive people has challenged these professionals for many decades.

D'Ambrosio (2008) ponders that social justice calls us to participate in decisions about ourselves and society. From his standpoint, Paulo Freire and he have always had a common view on of the goals of education, namely: to promote creativity, to help people achieve their potential, to raise themselves to the highest levels of their abilities, and to promote citizenship by transmitting values and showing rights and responsibilities in society. Pursuing such goals enables students to refuse rules and codes that violate human dignity.

The Freirean perspective refers to the curricular guidelines that should be based on multicultural aspects that include race, gender, individual differences, social class, social problems and social justice. Thus, it would assume a critical theory of curriculum, as Freire (2011) ponders in the book *Pedagogia do Oprimido* (Pedagogy of the oppressed), because it emphasizes the liberation of the individual through the critical study of social, political and economic reality, in the sense of raising awareness of the different social classes and structures to promote social justice.

2. Theoretical background

Mathematics education in its political perspective faces the challenge of thinking seriously about its role in contemporary society, which has promoted in many countries from its rulers social exclusion, oppression and cultural and financial impoverishment. Valero (2018) considers that mathematical educators need to understand the importance of the research they produce and the pedagogical work they do. For the author,

... the systematic reflection and conceptualization, on how the teaching and learning practices of mathematics are a field of political struggle on culturally valued forms of knowledge and on their role in the generation of categorizations and orderings of those who relate to them. It is to pay attention to how mathematical education is an area of social and material practices and relationships where power is historically performed, subjectivities are instantiated and ways of thinking and acting about others are generated, and in general, about the relationships between human beings and its material conditions of existence. (Valero, 2018, p. 41)

In this sense, the work of mathematics education is essential so that there is a transformation of reality, which, that leads to the humanization of society and the sense of belonging of the minorities in their totality. In order to do so, the curricular recommendations need to be re-dimensioned and connect with reality so that the critical awareness of our students is developed.

Curricula need to emphasize cultural diversity, equity of underprivileged groups, solidarity... The present times demand special attention to such questions, because, as Chomsky warns us (2018, p. 81), "solidarity is a very dangerous thing. From the viewpoint of the lords of humanity, you should only take care of yourself and not of others". According to the author, public education is being besieged, since it is based on the principle of solidarity and this displeases the ruling class that breaks with human principles to further defend their enrichment.

Awareness of the importance of equality among peoples, respect for cultural diversity, the promotion of social development and the idea of social justice are issues that have not yet been consolidated. They are not easy task, and cannot be achieved by a specific means of instruction. Teachers and researchers advocating education for social justice seek to build a society in which people have equal access to resources and receive equal treatment regardless of race, sex, religion, sexuality or economic conditions.

Equity and equality are nouns that necessarily make up society projects with humanistic nuances. In order to promote equality among unequals, they must be treated positively (with more care, attention and resources) so that they are promoted to the level of equality. In this way, if the school is indifferent to differences and treats the unequal equally, the status quo of inequality and inequity will not be called into question.

[...] to favour the most favoured and disfavour the most disfavoured, it is necessary and sufficient that school ignores, within the content of the educational content it transmits, of the transmission methods and techniques and the evaluation criteria, the cultural inequalities between the children of different social classes. In other words, treating all learners, however unequal they actually are, as equal in rights and duties, the school system is led to give its sanction to the initial inequalities before the culture. The formal equality that governs the pedagogical practice serves as a mask and justification for indifference with regard to the real inequalities before the transmitted - or rather demanded- teaching and culture. (Bourdieu 1999, p. 53).

Achieving equity in mathematics education is a key challenge for mathematics educators (NCTM, 2000). Education is intrinsically linked to the structures of economic, political, and social power in society that serve to perpetuate inequality in schools and in society (Apple, 1992; Bartell, 2013).

Considering those structures in relation to education and the call to equity, we refer to a mathematics education that aims to prepare students to take up the challenge of transforming the world in which they live, removing the barriers of discrimination and exclusion.

Thus, mathematics education faces a twofold imperative: to provide students with math instruction that includes the mathematics deemed necessary for success in the current system, while offering students the opportunity to use mathematics to expose and confront obstacles to their success (Bartell, 2013).

Faced with this, mathematics teachers who wish to adopt the perspective of social justice will have to put in motion a mathematics education that attends to the individualities of their students and the diverse contexts where it occurs. Through the process of using mathematics to study and understand their world, students strengthen their math skills. Simultaneously, students use mathematics to analyze critically their world, and ultimately to promote a democratic society in which everyone has the opportunity to participate fully (Frankenstein, 1987; Skovsmose, 1994). In other words, mathematics is used to teach and learn about issues of social injustice and support arguments and actions aimed at promoting equal change.

However, as Gutiérrez (2002) warns, as researchers in mathematics education, we operate with limited freedom and we are guided by a research agenda structured and poorly articulated around issues of equity. Although the scientific production in mathematics education focused on criticality and social commitment is growing, it is still necessary to enhance the articulations between theory and practice around equity and diversity as a form of resistance against emerging injustices and oppressions in the

world in which we live (Burton, 2003; Chapman & Hobbel, 2010; Frankenstein, 1987; Gutstein, 2003; Sriraman, 2008).

3. Some dialogues of Brazilian scientific production

In this item we present a synthesis of the approaches made by the authors in each paper that answered the call about research that on social justice, equity, equality, and mathematics education.

Initially, aiming to contribute to overcoming a school crisis that refers to inclusion, Kaleff and Rosa contribute to the reflections about the school inclusion of people with visual impairment, pondering how much the school needs to overcome the idea of homogeneity and seek strategies for equity, meaning respect for equality of rights for everyone, that is, that all have education, regardless of their potentialities and difficulties, respecting the singularities in favour of meaningful learning for each student.

Prioritizing the learning of statistics as an important collaboration in the training of people who can critically exercise citizenship, Porciúncula, Schreiber and Almeida bring important discussions about the development of statistical competences, pointing out the statistical literacy as a means of promoting social justice, by highlighting possibilities of contemplating the social context and strategies to promote criticality, in order to prevent social exclusion.

To provide fundamentals to the development of criticality, Assis and Bairral present and analyse the development of four geometry tasks by means of touchscreen devices, finding theoretical results that show the possibilities of nonlinear reasoning that help in the exercise of creativity and promote equity through interaction and collaboration among students.

Diversifying the thematic panorama of research, we have the discussions carried out by Monteiro et al., referring to the challenges faced in the development of a mathematics education that promotes ethnic-racial equity. Based on research carried out in a quilombola school, the researchers discuss the inclusion of strategies to rescue African mathematics as a form of contraposing discrimination.

Pursuing this differential in the research contexts, Sachs, Carvalho and Elias report two pedagogical proposals developed within the framework of the Landless Workers' Movement, based on the portions of the "Struggle for Agrarian Reform" and "Food Production" reality. The researchers reveal how mathematics can help people who are involved in a social movement to broaden their reading of the world, to understand their realities, and to acquire knowledge that enables them to transform such realities.

Rosa and Orey argue that teaching mathematics through the relevance of culture and personal experience helps students to know more about their reality, culture and society in which they live. They emphasize that ethnomathematics contributes to a mathematics education based on the principles of social justice, as it empowers students by proposing studies on real world problems involving them in a process that values cultural diversity and promotes equity.

Salazar uses critical realism to investigate the relationship between a mathematics classroom and the larger social context in which it is embedded. Critical realism is combined with critical race theory to understand how mathematics teaching practices

can challenge and/or break racism locally. The results explain how three black girls access mathematical knowledge, and how they participate in the distribution of authority in this classroom.

Lima and Borba discuss characteristics of youth and adult education in Brazil and, more specifically, how combinatorics and probabilistic reasoning can be developed as a means of social justice. They argue that students in this course have the right to be in touch with combinatorics and probability in order to be able to solve school and everyday problems that involve the knowledge of non-deterministic situations and the search for possibilities. By doing so, they expand their possibilities of critically interfering in their social contexts.

This set of studies reported in this thematic issue presents significant discussions about the diversity of critical scientific production developed in Brazil in the face of the challenges of Brazilian mathematics education.

4. Considerations

We saw that Brazilian researchers, in particular the mathematics educators, have focused on social contexts marked by social and economic inequalities, aiming not only to highlight the emerging problems, but also to point out ways that can make Brazilian children and young people aware that mathematical knowledge can help them act socially, based on human respect, solidarity, collaboration, respect for diversity, recognizing human rights, exercising compassion, building a society that includes and denies oppression, authoritarianism and exclusion.

In the discussions initially theoretical in this paper on mathematics education and social justice and, the panorama of the researches that are being socialized in this edition texts, is evidence the importance of rethinking our role as mathematical educators, both as researcher and teacher. Our ethical, social and political commitment should be the guidelines of our professional actions.

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