
Ethics and Solidarity in Mathematics Education: Acts of Creative Insubordination

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In this report we describe the professional life-histories of one teacher built from auto-biographical narratives. Solange shared an experience about a project developed with her students. Using her narratives we identified how the project about toys and games resulting from her acts of creative insubordination promoted the ethics education of her students. Through a pedagogy of inquiry, problem posing, and problem solving, young children contemplated issues of social equity and grappled with understanding the rights of children and the struggles of society to assure the well-being of all children. The students proposed and implemented activities within their control, demonstrating solidarity toward children less privileged than themselves, and showing evidence of ethical and moral development.

Introduction

In this article we discuss the pedagogical practices of a teacher of seven year-old children in a Brazilian school. Using a project centered on the Declaration of Children's Rights, she enacted her creative insubordination with respect to curriculum, transforming it in ways that engaged students in reflecting on what happens in society and in the world in which they live.

According to D'Ambrosio and Lopes (2014) the first discussions of creative insubordination appear in 1981 when Morris et al describe an ethnographic study conducted in the Chicago schools involving 16 school principals. In that report, the authors defined acts of creative insubordination as occasions when the principals made decisions that were contrary to the mandates of the school districts. In general, the

need to be disobedient occurred with the intent of diluting the dehumanizing effects of certain rules, protecting the professional decisions of the teachers that were based on the best interest of their students. The disobedience occurred to preserve ethical and moral principles, or to assure pedagogical practices grounded in principles of social justice.

Instances of breaking rules for the benefit of those one serves are called acts of “responsible subversion” in the nursing literature (Hutchinson, 1990). In the education literature, primarily in studies of school administrators, the preferred terminology is “creative insubordination” (McPherson & Crowson, 1993; Haynes & Licata, 1995). More recently, in the specific area of mathematics education, Gutiérrez (2013) describes teachers’ creative insubordination as necessary to set in motion the political action of mathematics teachers. For Gutiérrez, the political actions of a mathematics teacher would include acting in opposition to the standard curriculum, to evaluation practices, to rules and guidelines, when any of these seem to be unfavorable to the learning of one’s students.

Teachers are the key to creating a classroom environment with rich opportunities for learning. It is their responsibility to propose and organize tasks and to coordinate developmental learning activities for their students.

The teacher acts as a person and her actions constitute her professional self. Teachers’ actions are both product and process and correspond to their unique individualities. Behind their actions are their body, their intelligence, their feelings, their aspirations, and their ways of understanding the world. All of this is projected in each teacher’s undertakings, thus constituting the biography of the agent (Sacristán, 1999, p 31, *authors’ translation*).

In this sense, each teacher is unique, and defines his/her practices based on personality traits, feelings, beliefs, and expectations. When teachers are moved to enhance student learning and invest in improving the conditions under which such learning occurs, they create and put into motion standards and procedures that are aligned with their professional identity. At times these attitudes are responsibly subversive, and result in acts of creative insubordination.

As we considered teachers as protagonists in the construction of their practices and identities, we chose to conduct a study through

the narrative of Solange, understanding, as does Clandinin (2013), that narratives reveal how humans experience the world and assist in understanding how they characterize their human experiences. Since education is the construction and reconstruction of personal and social histories, narrative research allows for greater clarity about the phenomenon being investigated.

Solange's narrative reminds us that "the essence of the ethics of diversity is respect for, solidarity with, and cooperation with the other (the different). This leads to quality of life and dignity for all" (D'Ambrosio & D'Ambrosio, 2013, p. 21).

As Freire (2003) suggests the social and political solidarity is essential to our construction of a society that is less reprehensible and distressing, in which individuals can be themselves. It will be through a democratic educational process that individuals will come to understand themselves as social and historical beings, and dare to imagine and work toward a better society with dignity for all.

Methodology

In this study, we analyze both the oral and written narratives of Solange, understanding that the narrative takes on the dimension of the phenomenon under investigation and the method of investigation: the data are the (auto) biographical reports, shared with the researchers through interactive dialogue and in written form. Through (auto) biographical narratives the teacher shared specific dimensions of her individual life, as requested by the researchers. The narratives were then analyzed, according to specific criteria and procedures, to give meaning to the story (Bolívar Botia, Domingo Segovia, & Fernández Cruz, 2001). The criteria identified for analysis in this study were the acts of creative insubordination used by the teacher including: breaking from the prescribed curriculum; placing students at the center of the educational process; attending to students' understanding in light of the complexity of the topic; posing the challenge to students of experiencing the problem; venturing to place students in a situation where they could more readily "live" the unfamiliar reality and intervene in it; encouraging students to draw their own conclusions as they made sense of reality and shared their ideas with others.

The interviews that generated the narratives were conversations,

rather than formal interviews. In two conversations for a total of four hours Solange was asked to tell the researchers about her professional life history and was prompted for clarification or for greater details about the events as they were described in an effort to engage both interviewee and researchers in co-constructing the narratives (Clandinin, 2013). As a follow-up Solange provided the researchers with a written journal including several entries that specified the details of her lesson and included several pieces of student work that she had used to assess their learning.

The interviews were transcribed and all the material analyzed with several cycles of readings and hermeneutic interpretations. These cycles resulted in conjectures about Solange's actions of creative insubordination. According to Bertaux (2010) in the analysis of (auto) biographical narratives it is not important to extract all of the details that it contains, but instead it is important to consider only those elements that are relevant to the specific research study. Based on Bertaux's considerations, for this study, we extracted the indicators of creative insubordination that allowed us to better understand the components of the teacher's actions as she reinvented her practice in order to better meet the needs of her students.

Data Analysis

Introducing Solange

Solange studied to be an elementary school teacher and had the opportunity to take a course from Paulo Freire. To this day she teaches young children early literacy and numeracy and feels very successful in her profession. Throughout her career, she sought opportunities for professional development, by participating in courses, attending events, and listening to lectures. She participated in classes, study groups and research groups regarding mathematics teaching and learning.

Solange's Narrative

Solange teaches 7 year-old children in a private school in the interior of São Paulo, Brazil. In this school, one of the pedagogical approaches

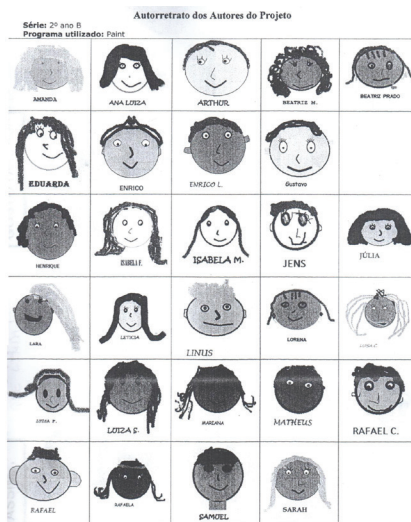


Figure 1: Children's self-portraits. Source: Solange's written narrative, 2014.

used is called “Class Projects”, where teachers become co-investigators with their students. The focus of the project to be developed in the classrooms is chosen by the team of teachers and administrators, and is based on an issue or problem raised in the Universal Declaration of Human Rights, or in the Statute of Children and Adolescents¹. The topics chosen relate to life within the community, people's lives, their needs, their interests and are appropriate for the age group of the students. Each year the children experience a unique Class Project appropriate for their age.

In this way a “landscape of investigations” (Skovsmose, 2014, p. 45) is created. This landscape permits students to explore the world in which they live learning that the interactions and the relationships with knowledge are essential components of life in society. In her narratives, Solange describes how the students asked questions that were of interest to them and that would guide their inquiry during the Class Project titled: Children's Play. After discussing the coherence, pertinence, and adequacy of their questions the class settled on the following list to guide their inquiry:

1. How can we build toys and how are the toys that we buy actually made?

2. Which spaces in school are adequate for playing? Why are they adequate?
3. Are rules important in play? Why? How can we respect them?
4. How can we care for ourselves and others during play?
5. Why are there children who can't play? How could we help them? (Solange's written narrative, 2014)

In this article we draw from the teacher's narrative to discuss question number 5. The children, along with their teacher, developed an action plan to investigate the question. In particular they sought to: learn about the Declaration of Children's Rights; understand each other's life histories; observe similarities and differences in their histories and human condition; learn about the stories of children who work and cannot play; draw conclusions. (Solange's written narrative, 2014).

The students dove into their inquiry project by researching the 7th Principle of the Declaration of Children's Rights.

The child is entitled to receive education, which shall be free and compulsory, at least in the elementary stages. He shall be given an education which will promote his general culture and enable him, on a basis of equal opportunity, to develop his abilities, his individual judgment, and his sense of moral and social responsibility, and to become a useful member of society. The best interests of the child shall be the guiding principle of those responsible for his education and guidance; that responsibility lies in the first place with his parents. The child shall have full opportunity for play and recreation, which should be directed to the same purposes as education; society and the public authorities shall endeavor to promote the enjoyment of this right. (United Nations, 1959)

Having read this principle and worked to understand the vocabulary in it, the children discussed it in light of their lived experiences, learning of the life histories of each child and searching for similarities and differences in their stories. In this activity the teacher worked with the children's literacy development as suggested by the Freirean perspective in which reading isn't walking among the letters, but rather interpreting the world and being able to use words to interfere in the world through actions. In this way literacy development in language and in mathematics occurs in the act of coming to know.

Translation:

Title: *What I like*

My name is Ana Luiza. I am 7 years old. My hair is black, my eyes are brown. I like to wear dresses. I like to play chasing and hide-and-seek. My school is very cool I like to play at recess and I like to play on the teeter-toter. I like to read. I have an.... My favorite color is purple. I love to read because I learn a lot of new things.

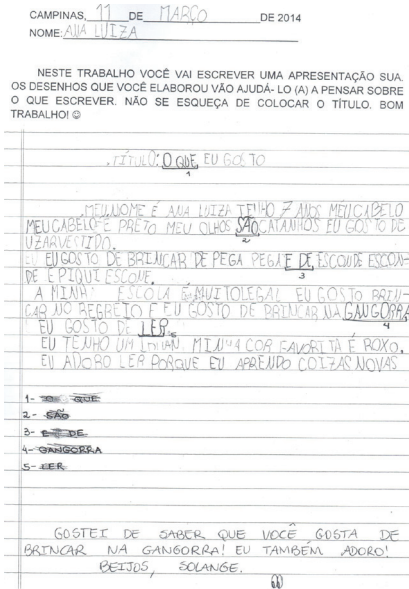


Figure 2: Ana Luiza’s text. Source: Solange’s written narrative, 2014.

We interpret Solange’s actions of working with the children to understand the legislative language of this official document as an act of creative insubordination. Solange found a way to convert the complex language of the document into language that was accessible and comprehensible to these very young children, who were just beginning to learn to read and write. She helped them to make sense of text typically belonging to the world of adults.

On a day following the discussion of the Declaration of Children’s Rights, the children created a collage of their self-portraits as seen in Figure 1.

The development of the self-portrait occurred in an effort to produce a text with the central theme: “Who am I?”, an example of which is shown in Figure 2.

Each child read his or her text to the group so that they could get to know each other a bit better. They each chose one of their favorite toys from when they were younger, to bring to the classroom and include in their stories. The goal was to identify the similarities and differences in their life histories and social condition.

The children learned that the first social group to which they belonged was the family and as they grew they became part of several

TÍTULO: AJUDAR AS CRIANÇA

ERA UMA VEZ O PAI CIGHA MAVA JULIO
 E A MÃE CIGHA MAVA RAFAELA E O FILHO CIGHA
 MAVA CAIO E A FILHA CIGHA MAVA BIA
 E A BIA E O CAIO GANHARAM UM PRESENTE DOS CEUS
 PAIS A BIA GANHO UMA BONECA O CAIO GANHO
 UM DALHACO.

ELES BRINCARAM MUITO E ELES PULARAM,
 DE REPENTE E ELES COMEÇARAM A BRIGAR A I UM
 PUXA DAI UM PUXA VILAPA I UMA ORA ELES QUE
 BRABAM OS BRINQUEDOS DAL ELES FORAM VER TELE-
 VISÃO E NEM LIGARAM PARA O BRINQUEDO.
 ELES GANHARAM O BRINQUEDO E A I NO DIA SEGUINTE
 UM CAMIÃO PASOU PELA RUA E PERDOU O LIXO
 E DAI O CAMIÃO LEVOU PARA O LIXO DUAS CRI-
 ANÇAS ENCONTRARAM O BRINQUEDO NO LIXO.
 ELES PEGARAM A GUA MOXILAS E FORAM PARA SUA

1- AJUDAR 4- NEM LIGARAM
 2- GANHARAM 5- NO DIA SEGUINTE
 3- COMEÇARAM

Figure 3: Ana Luiza's written text. Source: Solange's written narrative, 2014.

other groups, such as classroom, school, club, swimming class, ballet, gymnastics, play group, etc. This stage of the project enabled the children to identify the different groups shaping their identities.

During the next stage of the project, which involved learning the stories of some children who work and can't play, the teacher launched the conversation with a piece of children's literature titled "Brinquedos" [Toys] (Neves, 2006). The text-less picture book depicts the story of two children who receive gifts: a girl is given a doll and a boy is given a clown. After playing quite a lot with their toys, the toys get old and are thrown in the garbage. The old toys end up in the city's garbage dump yard. There, two children going through the garbage to find anything salvageable, find the toys, fix them, and begin to play with them. The very expressive illustrations convey the characters' expressions of delight upon finding the old toys and their expression of attention as they carefully fix the toys. Having "read" the story as a whole group, each child wrote paragraphs to retell it based on the illustrations, as seen in figure 3.

The experience with the book helped the students to become aware of the reality of the lives of other children with whom they do not normally interact and to realize that they share the same desires to

play and to have toys, and that they valued the toys they were able to have. Solange contemplates:

In this context, the children have the opportunity to realize that there exist social inequities in our society and that the children of the dump also have the desire to play and that they do play. This experience resulted in a perception that in our society not all children live in the same conditions. The children realized that there are life conditions that are very different. (Solange's narrative, 2014)

The teacher recognized an opportunity to delve more deeply into the topic, suggesting that they read another piece of children's literature titled: "Serafina and the child who works" (Azevedo, Huzak & Porto, 2005). Her goal was to help the students better understand the human condition of many children in the world, who have to work. Solange wanted to sensitize them to their condition of privilege, and to an understanding that these inequities must to be resolved by society, that it is a problem for all of us to consider and strive to solve.

However, Solange did not want the students to simply read about these realities, so she planned a field trip to a public school for children ages 3 to 5, which caters to a very poor community. Solange once again turned to creative insubordination as she took the children beyond the boundaries of the school, in order for them to experience an unfamiliar reality. With this subversive act she challenged the children to contemplate the reality of others, less privileged than themselves. The age of the children and their socio-economic status as members of an economically privileged social class had hindered their opportunities to get to know children of different economic status living in poverty stricken communities.

She states that her goal was to "reduce the sentiments of indifference and discrimination towards the children living in such social conditions, those from such a different socio-cultural reality" (Solange's oral narrative, 2014).

In preparation for the trip, each student chose a book and practiced reading it, in order to read the book to a child during the school visit. In addition, the students planned to gather data in order to unveil the types of play activities that are part of the lives of the young children. For this, the students developed interview questions to ask of the

children during the school visit. The students also built, with the help of an artist who crafts toys, four toy cars made of wood. The interaction with the toy-maker provided students with a perspective on how human creations can result in objects that bring joy and a sense of well-being to others.

The experience of visiting a school that was very different from theirs was very significant for the students. Solange shares that her students were able to perceive some similarities with the children they met, like the fact that they all enjoy playing and creating games. They were surprised that some of the children were unfamiliar with some of their favorite games. During the visit, they had lunch at the school, eating the free lunch that is fed to children in the public schools. Coming to know the reality of others with less privilege than themselves permitted Solange's students to reflect on their own reality, to appreciate the foods that are available to them and that they take for granted, and to reflect on the meaning of wastage and the value of what they have.

Solange's daring act of taking her students to experience an alternative reality, and to co-develop with them a plan to intervene in that reality is evidence of her responsible subversion. She seized an opportunity for developing in the students the reflective tools needed for responsible citizenship. The students had the opportunity to learn that legislation alone is not enough to ensure the well-being of children. Instead, it is possible and important to intervene in reality with actions of solidarity. She enticed her students to imagine and create acts of insubordination toward the social status quo.

Solange shared that upon returning to school, the students composed a collaborative text in which they discussed what they had learned. They stated that they enjoyed meeting new children and teaching them new games and reading them stories unfamiliar to them. They realized that their visit brought joy to the children they visited and the students themselves expressed joy and pleasure in the work they had accomplished.

The development of the collective text provoked the students to communicate their feelings, their perceptions, and their conclusions. The teacher acted with responsible subversion as she encouraged the students to share their ideas and listen to the ideas of peers, co-constructing meaning based on the readings of the world that they were able to do at this young age.

DO QUE ELES GOSTAM DE BRINCAR NA ESCOLA?

NOME DA BRINCADEIRA	QUANTIDADE DE ALUNOS
Pega pega	4
Boneca (o)	4
Carrinho	4
Quebra cabeça	3
OUTRAS BRINCADEIRAS: Esconde esconde Parque Pataá pataá Cabelereiro Ferramentas Escorregador Bola	

DO QUE ELES GOSTAM DE BRINCAR EM CASA?

NOME DA BRINCADEIRA	QUANTIDADE DE ALUNOS
Carrinho	2
Correr	2
Boneca (o)	5
Bicicleta	2
OUTRAS BRINCADEIRAS Ursinho de pelucia Amarelinha Pular corda Polly Max Stell Barbie Homem aranha Desenhar Nada Pingue Pongue Esconde esconde	

COM QUEM ELES COSTUMAM BRINCAR?

QUAIS PESSOAS?	QUANTIDADE DE ALUNOS
Papai	1
Mamãe	1
Sozinho	1
Amigos	13
Primo	1

QUAIS ATIVIDADES VOCÊ FAZ FORA DA ESCOLA?

NOME DA ATIVIDADE	QUANTIDADE DE ALUNOS
Desenho	2
Pintura	1
Futebol	1
Capoeira	1
Karatê	1
Não faz atividade	14

Figure 4: Interview data tabulated by the children. Source: Solange's written narrative, 2014.

To enhance the student's reading of the unfamiliar reality, the data collected were analyzed. The students tabulated the responses to the interview questions as shown in figure 4. The organization of the information in tables provided another means of determining similarities and differences in comparing the realities of the lives of the children with their own. For example, from the interview data the students found that while they play in groups when at school, they typically play individually at home. Individual play occurs with commercial toys and electronic games. On the other hand, the children of less privilege tend to play in groups both at school and at home. Having no access to electronic games and little access to commercial toys, they are more likely to play together, to play outside, and to play cultural games such as chase, and hide-and-seek.

Another significant fact that the students discovered was that, differently from themselves, the children they visited did not engage in out of school activities, like ballet lessons, swimming lessons, music lessons, foreign language lessons, clubs, etc. This realization further added to their understanding of socio-cultural differences, social

inequities and injustices. They came to appreciate the privileges of their lives and the conditions often unavailable to others. This is the first step towards building solidarity.

Solange claims that the visit to the public school was “a way to make real the right of children to play and enjoy themselves, as is stated in the 7th principle of the Declaration of Children’s Rights” (Solange’s oral narrative, 2014). The narrative shared by Solange illustrates the possibilities of developing the ethical dimension of mathematics education in problematizing with students issues of social justice present in the culture of childhood.

Conclusions

In several instances throughout the experience Solange had the students pose and solve problems (Lopes, 2011). Solange’s views that the learning of mathematics and statistics is enriched when children engage in solving problems that they themselves identify within the real world, shaped how she provided opportunities for students’ learning, as they collected information that became data for analysis and understanding. At the heart of Solange’s instruction was the doing of mathematics and statistics as students communicated, reasoned, investigated, collected information, and used the data to analyze and understand, or “read,” the reality of the world around them.

Throughout the experience, as the students unearthed information and attempted to make sense of it, they found themselves immersed in a world of differences and contradictions. Through Solange’s acts of insubordination towards the prescribed curriculum, the students contemplated economic and cultural realities that were unknown to them. The pedagogical moves taken by the teacher resulted in the collective construction of knowledge with emphasis in humanizing children as they acquired moral consciousness regarding their childhood in contrast to the childhood of others.

This type of experience creates a foundation for children’s understanding of societies in which humans are living in inhumane conditions. It will encourage children to engage in the deep and robust critical reflection necessary for solving the social problems, the economic problems, and the problems of preservation of the world’s natural resources in order to envision a better world with dignity for

all (D'Ambrosio, 2014). The teacher's practice promotes the development of a generation of human beings who may be able to overcome the limitations of the current adult generation that has been unable to deal with the problems of society and the world. The experiences of this group of children encouraged their development as ethical human beings, with compassion, solidarity, and understanding social justice as resulting from actions that are much more complex than simple acts of charity.

Notes

1. The Statute of Children and Adolescents is an official document (Law 8,069 of July 13, 1990) in Brazil that legally assures the human rights of all children.

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