

The place of fiction in textual production of ethnomatematics

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Abstract

This work highlights some of the aspects of the narrative inscribed in the world of Ubiratan D'Ambrosio's text and, in particular, that present in his works aimed at disseminating Ethnomathematics. The literary intersections made in the text and the field of possibilities opened by the fictionalization of stories in its writing stand out. The theoretical and methodological perspective is inspired by the Ricoeurian narratological hermeneutics and adopts the composition of the plot as the guiding thread of the analysis/interpretation.

Keywords: Narrative; Fiction; Ethnomathematics; Composition of the intrigue.

O lugar da ficção na produção textual da Etnomatemática

Resumo

Este trabalho evidencia alguns dos aspectos da narrativa inscrita no mundo do texto de Ubiratan D'Ambrosio e, em particular, aquela presente em suas obras destinadas a divulgação da Etnomatemática. Destacam-se as intersecções literárias efetuadas no plano do texto e o campo de possibilidades abertas pela ficcionalização das histórias em sua escrita. A perspectiva teórica e metodológica se inspira na hermenêutica narratológica ricoeuriana e adota a composição da intriga como fio condutor da análise/interpretação.

Palavras-chave: Narrativa; Ficção; Etnomatemática; Composição da Intriga.

El lugar de la ficción en la producción textual de Etnomatemática

Resumen

En esta obra se destacan algunos de los aspectos de la narrativa inscritos en el mundo del texto de Ubiratan D'Ambrosio y, en particular, el presente en sus obras destinadas a difundir la Etnomatemática. Destacan las intersecciones literarias realizadas en el texto y el campo de posibilidades que abre la ficcionalización de los relatos en su escritura. La perspectiva teórica y metodológica se inspira en la hermenéutica narratológica ricoeuriana y adopta la composición de la trama como hilo conductor del análisis / interpretación.

Palabras clave: Narrativa; Ficción; Etnomatemáticas; Composición de La intriga.

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1. Introduction

The object analyzed/interpreted in this work is the so-called **world of text** (RICOEUR 2012a; 2012b; 2012c) - “What is, in effect, interpreted in a text is a proposed world, a world that I could inhabit and wherein I could project one of my ownmost capabilities” (RICOEUR, 2012, p.300) - and, more precisely, D'Ambrosio's **ethnomathematical world of text** (1985, 1986, 1990, 2011). The textualized thoughts, enunciated ideas, the beliefs spoken, defended values and, also, and no less significant, the knowledge enmeshed in the textual plot of D'Ambrosio's are part of this world.

It is observed that D'Ambrosio (1990, 2011) was one of the main characters involved in the theoretical construction of Ethnomathematics and, also, one of the greatest defenders and disseminators of the ethnomathematics ideal in the field of Mathematical Education in Brazil, recognized by some researchers as the father of Ethnomathematics (MIARKA, 2011; GERDES, 1996, 2010; KNIJNIK, 2004, 2012; FANTINATO & FREITAS, 2018; CONRADO, 2005; ROSA & OREY, 2014). In addition, it is noted that D'Ambrosio remains one of the main theoretical references in other studies and research (FANTINATO & FREITAS, 2018). It is assumed, within these limits, that the d'ambrosiano's textual universe influences the thinking and writing of other subjects in the field of research (BAMPI, 2003; BREDÁ, 2011), which highlights the relevance of this investigation.

The analytics and interpretation carried out in this endeavor are inspired by the works of the French philosopher Paul Ricoeur (1913-2005). The **composition of the intrigues** (RICOEUR, 2012a, 2012b, 2012c) that interweave the narratives of the stories told by D'Ambrosio in his world of ethnomathematics text is explored. With this, one seeks to highlight the place of **fiction** in his writings. The reflections of the historian Hayden White (1928-2018) can be triggered in this scenario, because, according to the historian:

The way in which a given historical situation must be configured depends on the subtlety with which the historian harmonizes the specific plot structure with the set of historical events to which he wishes to give a particular meaning. It is essentially a literary operation, that is to say, a creator of fiction. (WHITE, 2014, p. 102).

In this context, one could ask, “What is the role of fictional literature in the composition of the plot of the d'ambrosian's ethnomathematical narrative?”, Or even “how and when the fictional writing is triggered within the textual work signed by the aforementioned mathematical educator?” or, more broadly, “how does D'Ambrosio tell his stories of history to a generic reader?”.

2. The text, the composition of the Intrigue and the fiction

The **intrigue** (plot) of a narrative is one of the main categories of analysis and interpretation proposed by Ricoeur (2012a, 2012b, 2012c) and, more precisely, the **composition of the intrigue**², that is, the ways in which the plot of the story is interwoven. narrative within the world of text. According to the philosopher, in the composition of the intrigue - **mythos**³ - the action of man is imitated and, in the narrative, this action goes through transformations, from the beginning to the end of the story, with the objective of sensitizing and moving the reader (RICOEUR, 2012a). The French hermeneut states, moreover, that “the composition of the intrigue constitutes an authentic component of the historiographic operation” (RICOEUR, 2007, p.250), because, namely, “the intrigue is the literary form of this coordination: it consists of to conduct a complex action from an initial situation to a terminal situation through regulated transformations” (RICOEUR, 2007, p.255).

Other categories of analysis can be triggered in the investigation, such as, for example, the **characters** and their roles in the plot, the **time** of the narrative, the **space-environment** in which the actions take place, and, also, the **narrator** and the **voice of the narrative**. Thus, for example, on the narrator and the writer, the following distinction is made:

The writer is a human being who existed or exists, in the flesh, in our universe. Its existence is located in the “non-text”. Beside him, the narrator - apparent or not - only exists in the text and through the text, through his words. In any case, he is an internal speaker: one who, in the text, tells the story. (REUTER, 2014, p.19).

A pertinent observation on this point concerns the **text**. For the French philosopher, the notion of text is related to the concept of discourse, the inscription of the discourse and, in addition, the text establishes a **space of distance** (RICOEUR, 2011) between the world of text and the empirical, socio-historical - “the fact of being written makes the discourse the carrier of a history that is no longer that of its author” (RICOEUR, 2011, p. 29).

The narratives that emerge from the tracks of the writer's memories and that materialize in the plot from the voice of the narrator, despite assuming the historical garments of historiography, that is, assuming true intentions, are still stories. And, in this context, they can be understood as **verbal fictions** (RICOEUR, 2012a) in a **possible world** (the world of the text).

The exercise proposed in this analytical and interpretative journey is that the world of D'Ambrosio's ethnomatematics text is seen as a **literary object**. The **fiction** of the work in this movement will reveal itself to the reader. The meaning of the word **fiction** is linked, in this case, to

² It is read in Carneiro (2013) that this methodological path intertwines hermeneutics and narratology through the thread of intrigue.

³ The Greek term in the aristotelian text is **mythos**, in its translation, accepts the two explicit meanings: fable or intrigue (RICOEUR, 2012a).

“history and the world built by the text and existing only by its words, its phrases, its organization, etc.” (REUTER, 2014, p.17).

3. The place of literature in the life of the writer

What is the role and value of literature for Ubiratan D'Ambrosio? In an interview, in 2008, the mathematical educator provides some clues about the role that literature plays in his formation, in his way of seeing and understanding the world and, also, in his own writing⁴. According to him, in his adolescence, his interest in historical readings and also in fictional literature grew - Shakespeare (in English), Cervantes (in Spanish), Balzac and Flaubert (in French). He reveals to us that:

I did not learn German - I am sorry - and I did not meet Goethe, Thomas Mann and so many other German writers, which I would only find a little later in translations. These authors marked me a lot. At one point in my life, approaching forty, I discovered another direction of reading, greater intimacy with the author and the search for something that he did not want to make explicit. It was a search for a mystical dimension, perhaps psychic, of the spirituality intrinsic to the work. I set the starting point for redirecting my readings to my access to Rollo May's book: *Love and Will*. I learned to read my inner self (D'AMBROSIO, 2008, p.20).

According to him, “Hence it was a re-fascination with history and the reinterpretation of the Greek classics”(D'AMBROSIO, 2008, p.20), and, in addition, also “Freud, Jung and William Reich [...] Thomas Mann, Aldous Huxley, Hermann Hesse and the impressive Robert Musil” (D'AMBROSIO, 2008, p.20). The mathematician continues:

I was also very influenced by French postwar critical thinking. Particularly Lacan, Derrida, Sartre, Merleau-Ponty, Foucault and so on. It was a way of discovering me. German cinema, particularly Fassbinder and Herzog, as had already happened with Bergman, fit very well in my growing interest in the transdisciplinary and transcultural view of the symbolic world. Popular readings about this symbolic world, then bestsellers among the youngest, attracted me a lot. I read, with great interest, J.D. Salinger, and the very interesting *Zen and the Art of Motorcycle Maintenance*, by Pirsig. This approach to the East, characteristic of the beginning of the second half of the 20th century, was and continues to be very attractive to me. (D'AMBROSIO, 2008, p.20)

At this point, it could be assumed that the textual d'ambrosiana production has an implicit literary / fictional dimension and that, a hypothesis to be explored, is that of intertextuality and the multiplicity of voices that echo in his world of text. D'Ambrosio adds, in his interview, that:

⁴ Source: **Revista Rascunho**, year 9, number 102, october 2008.

In fact, I felt that the social issue, for example as present in neo-realist cinema, must necessarily go through the issue of the individual, in his intimacy. I started to see in the intimacy-alterity balance the meaning of happiness in the human condition. At that time, I was very involved in peace issues, being active in the Pugwash Movement, of which I was a member of the Council (the Movement's largest body). The movement receiving the Nobel Peace Prize was a great stimulus for a more careful re-reading of the classics, mainly *The Art of War*, by Sun Tzu, *The Prince*, by Machiavelli, *War*, by von Clausewitz and, of course, *War and Peace*. Shakespeare also helped a lot to understand the (un) balance between emotional and power, another form of intimacy versus (or more?) Otherness. (D'AMBROSIO, 2008, p.20)

The mathematician, then, assumes something that, until now, has only hinted at, namely, that “Science fiction literature, with scenarios of an imaginative and fantastical future, has attracted me and incorporated itself into my courses and lectures” (D'AMBROSIO, 2008). The possible future, as opposed to the present moment, seems to be especially important in the composition of the narratives of the stories that populate the world of d'ambrosian's ethnomatmatic text. Finally, he attests to the following:

Literature is an integral part of my day. I have an excellent dialogue with the authors and discuss a lot with literary critics. I like literary criticism a lot. My work method points to the encounter with the different. Today, for some years now, my activity is, fundamentally, the history of humanity, focusing mainly on the history of religions, the history of science and the history of mathematics. (D'AMBROSIO, 2008, p.20)

It can be said that in this moment of rediscovery of literature, of encounter with cinema, of debate with literary criticism, in which the mathematician performs his reinterpretations of the Greek classics, he also begins to produce his ethnomathematical text. There is, therefore, on the socio-historical level of the writer's concrete experience a huge literary / fictional repertoire that possibly materializes in his written production.

4. From enunciation to statement

It is observed that a significant part of the textual production of the mathematical educator is based on a textualization of his oral discourse (D'AMBROSIO, 1985, 1986, 1990). Many of his reflections emerge from interviews, debates and lectures (MARCHON, 2018). Part of his production goes from enunciation to statement, from orality to textuality /writing. Therefore, it is understood that part of the textual work that reaches the reader was initially designed for presentation in front of an audience⁵. It is necessary to consider, for interpretative purposes, the existing distances between what

⁵ It is understood here, in this context, that many of the ideas defended by D'Ambrosio were presented in seminars, lectures, round tables, etc. Thus, people of flesh and blood, socio-historical subjects, some sympathizers and other critics of the ideas that were spoken, were present in the audience.

was said, spoken, pronounced by the socio-historical, empirical, flesh-and-blood subject, in a certain space-time, with its specific intentionality, for a given audience, and what was later transcribed and textualized for any potential reader and narrated by the voice of a narrator.

It is understood, therefore, that one of the objectives not stated by the mathematician and that must be assumed to be relevant in analytics is his intention to convince and persuade the listening public in specific scenarios and contexts. Communicating your educational ideas about teaching mathematics to a real audience, resistant to your ideas, is something that should be considered by readers of the world of d'Ambrosio's ethnomathematical text. The challenge of the mathematical educator was not exactly, and only, to inform something to someone, but, fundamentally, to win the sympathy and adhesion of a hostile public to the ideas enunciated (see, for example, the preface in D'AMBROSIO, 1986).

5. Characters

A first observation about the text produced and signed by D'Ambrosio (1985,1986,2011) is the proliferation of characters and the multiplicity of voices that echo in his world of text. Some are real, socio-historical subjects, others are purely fictional, products of literary creation. In this encounter between reality and fantasy, the writer interweaves facts and fictions to produce his arguments of persuasion and persuasion.

both "Lumsden" and "Wilson" appear in the story as secondary characters identified by their names; they are non-fictional beings and possess an identity; they are associated with some idea, concept or research that, within the story narrated by D'Ambrosio (1985) assumes some importance. Similarly, when the narrator-author attests that "ideology, implicit in dressing, housing, titles, so superbly denounced by Aimée Cesaire in *La Tragédie du Roi Christophe*" (D'AMBROSIO, 1985, p. 77), there is a character non-fictional (Aimée Cesaire) and a fictional character (Rei Christophe) that appear in the plot's composition to support the reflections on ideology. (MARCHON, 2018, p. 180)

In composing his intrigue, D'Ambrosio also explores the dramatic aspect (in the theatrical sense), staging speeches and events for a virtual audience. So, for example, by appropriating the voice of the character Don Quixote, he simulates a fictional dialogue with his reader - "Forgive me, my friend, for having caused you to appear as mad as I by leading you to fall into the same error, that of believing that there are still knight-errant in the world"⁶ (D'AMBROSIO, 1985, 1986, 1999). The

⁶ Epigraph of the last chapter of D'Ambrosio (1985). The featured speech is part of Cervantes' work, "the death of Don Quixote". This same quote is in the preface by D'Ambrosio (1986) and in other productions by the mathematical educator.

writer appropriates the voice of the wandering knight who, at the end of his journey, on his deathbed, apologizes to his loyal squire. Some characters observed in D'Ambrosio (1985) can be seen below:

Table 1 - characters in D'Ambrosio (1985).

Personagens	
Personagens nomeadas	Personagens tipo-genéricos
Ubiratan D'Ambrosio; C.G. Jung; Meister Eckart; A. Koestler; Charles Morazé; César Lombroso; P. Picasso; Bernard Shaw; Leonard B. Mayer; François Jacob; Dom Quixote ; Miguel de Cervantes; Isaac Newton; David Baltimore; Keukulé; Hadamard; Poincaré; Paul Feyerabend; Alfred Sohn-Rethel; Kwasi Wiredu; Michel Foucault; R. L. Wilder; Lumsden e Wilson; Smorynski; Tadasu Kawaguchi; Robert Musil; Törless ; Gaston Bachelard; Jürgen Habermas; J.L. Austin e A.G. Howson; H. Burkardt; B. Spornoro e V. Villani; Eduardo Luna; Bryan Wilson; Aimée Cesaire; Rei Christophe ; George Cantor; K. Marx; C. Darwin; L. Kroenecker; Manzoor Ahmed; Merian Webster; Philip J. Davis e Reuben Hersh; Mircea Malitza; Touré; Chamorro; Patrick J. Scott; Gloria Gilmer.	ISGEm; Western Thought; The Creator; Book of genesis; People ; We/ us; Students; Learners; society; Mathematics; Ethnomathematics; Curricula; Traditional way; School system; School mathematics; Mathematics education; Secondary school teachers of mathematics; Secondary school systems; Teachers; Unqualified teachers; Children; Industrialized countries; Developing countries; Latin American Countries; Lower middle class; Uneducated people; Illiterates; Our species

Source: Marchon (2018)

The generic-type characters that fill the narrative are not detailed, developed or have an in-depth profile in the plot. These, in general, represent a collectivity, a group, an indistinct mass of beings. Implicitly, an idea of collective identity is assumed. Planning that creates an idea of homogeneity of the beings that make up the group. So, for example, we speak: the Greeks, western man, third world countries, our species, illiterate people, poor middle class, teachers, western thought, etc.

6. Utopian fiction

It can be said that, in many ways, the d'ambrosian's ethnomatematical text moves between the historical narrative and the utopian narrative, from the historiographic genre to the utopian literary genre (TROUSSON, 2005; SARGENT, 2005; FIRPO, 2005; CIORAN, 1994), from facts to fiction. In order to better understand this displacement, it is necessary to recognize some of the characteristic

elements of utopian narratives. D'Ambrosio's historical writing describes a ruined, threatening, problematic world. It is necessary to present poetically what requires us, socio-historical subjects, commitment to change. Only from there is it possible to enunciate a new model of the world.

There would be no need to emphasize that society going through dramatic changes in the last 30 years. Coming from the destruction seen in World War II, which more than anything else aggravated the tensions and contradictions resulting in part from the internal crisis of the capitalistic mode of production and property, and on the other part from the almost dichotomic unbalance on economics, social and political development between the so-called North and South nations. In the other terms, by the shameful misery which characterizes Third World nations in contrast with ever increasing prosperity in the developed countries. (D'AMBROSIO, 1985, p.8- 9)

The d'ambrosian's ethnomathematical writing describes a fearful past and suggests an ethical shift of man towards a better future. It creates the ideal of a **world yet to come**. It can be said that one of the propositions of d'ambrosian's ethnomathematics, in its first elaborations (D'Ambrosio, 1985, 1986, 1990), is to overcome the terrible reality presented to the reader.

This work does not intend to advance on an analysis of the utopian literary aspect of d'ambrosian's writing, but, nevertheless, the categories listed by Marques (2009) in his **poetry of perfection**⁷ are indicated as the path.

7. Crisis and apocalypse

D'Ambrosio's ethnomatmatmatical text also uses an **apocalyptic poetics** at the level of the composition of the intrigue (KERMODE, 2000).

The crisis instituted by apocalyptic thinking allows the narrative to be structured based on a sequence of actions, until the moment before the emblematic end, so that it is possible to reverse the crisis enunciated. The narrative must therefore undergo an emblematic turn in action.

⁷ (1) the construction of an ideal world as an alternative to the real; (2) belief in the human species; man as the redeemer of man (anthropocentrism); (3) the defense of a legislative / ethical code capable of promoting public well-being in which "should-be" becomes "being"; (4) the utopian world is governed by the principle of utility; all social gears must be functional and useful; (5) social uniformity is created; the convergence of interests aims to appease human conflicts; (6) the utopian world is unidirectional and constrains everyone to follow a model in which "evil does not touch" (CIORAN, 1994, p.103); (7) the utopian narrative promotes the dream of collective happiness and "the utopian willingly advises collectivism (TROUSSON, 2004, p. 36); (8) the individual hero gives way to the collective hero; (9) in utopia, evil can only exist as the antagonist to be overcome; (10) the utopian narrative is only established through the presence of narrator-witnesses, almost externalities of the described world and, therefore, able to propose the transformations; (11) it also promotes a journey from the real to the ideal, from abandoning old values to proposing new ones; (12) utopia is directed towards the future; (13) the architectural space of utopia is that of mathematics, geometry, and the ordering of the world; etc.

The time of the narrated story depends on the mythic ending described and the crisis that precedes it, and therefore, history inevitably states that the present time is the time of transition, of transformation, it is the time of being between.

D'Ambrosio (1990) creates a story that narrates a critical, disturbing and distressing moment for the human species. All men are, in their **story** of **history**, on the verge of extinction.

We will be reaching the end of a cognitive model in which, at the same time that it allows us to approach a totalizing truth, which reveals the small and the big, the interior and the exterior, forces us to take the final step towards sacrifice total, and thus reach the existential goal, extending the goal of extinction for all species towards which we are inexorably moving as individuals? (D'AMBROSIO, 1990, p. 44)

The change is necessary for the plot to have a non-apocalyptic ending. The aim is to link the reader, to compromise him ethically, to avoid the "total sacrifice" (ditto) announced. How to avoid the apocalyptic end? What can solve the crisis enunciated?

Within the d'ambrosian's argumentation, mathematics and its teaching are the basis of all technological and scientific transformations that can, for better or for worse, change humanity. And, therefore, a solution proposed by the mathematician is to act in the educational field, seeking the transformation of society, based on a new model of Mathematical Education. "Ethnomathematics appears, in this case, as a poetic solution to the crisis instituted in history" (MARCHON, 2018, p. 149). And in this context, the following is read: "my educational proposal represents hope of redemption for some and threat to others" (D'AMBROSIO, 1985, p. 8).

8. The young Törless in Ethnomathematics

See, for example, returning specifically to the cut of the use of fictional characters in the composition of the intrigue of the narrative, the case of Young Törless (D'AMBROSIO, 1985).

In the third chapter of the book "Sociocultural bases of Mathematics Education", between pages 51 and 56, the writer appropriates a fictional fragment to compose his own argument. At this point in the plot, there is a criss-crossing of the dramatic, poetic and rhetorical aspects.

The writer uses the work of the Austrian writer Robert Musil (1880-1942). It is observed that, despite the fragment's relevance to the writer's argument in his text, the work is not mentioned in his references.

According to the mathematical educator, it is one of the masterpieces of literature of that century, written by one of the most important German-language writers⁸. And with that, he uses an argument of authority in order to persuade and convince the listener/reader about the value and importance of the material that will be used. From an implicit pact of trust between writer and reader, it reads that:

It is a study of adolescence through the eyes of a sixteen-year-old student at a selective military academy. Among the various experiences of young Törless, there are some questions about imaginary numbers with his colleague Beineberg and a subsequent interview with his math teacher. The dialogues cited reflect an external view of what mathematics is and the way mathematics is practiced at school, exactly in the age group we are concerned with in this article. The opinions of people outside the circle of mathematics practitioners - and here I place both mathematicians and teachers - express about the discipline, as for example, those of Robert Musil through the characters of his work, very clearly reflect our image in the eyes of the general public and, consequently, of our "customers", the students. In fact, in the school system we try to sell an idea, to convey a message. The student's preconceptions are decisive, to a large extent, in the success or failure of our mission (D'AMBROSIO, 1985, p.51)

The hypothesis that is made is that the view of the writer Robert Musil about mathematics and its teaching, a view external to mathematics and distinct from that shared by mathematicians and mathematics teachers, is totally passed on to the action staged by the characters of the world fictional. Fiction is supposed to, in this case, portray reality as it really is. D'Ambrosio's argument (1985) ranges from the particular (the character Törless) to the general (all teenage students), from the fictional (Musil's work) to the real (the empirical, socio-historical world of the 1980s).

An observation, at this point, concerns the game of **questions and answers**⁹ that occurs from the dialogic interaction and dialogue between the characters of the fictional work:

During the mathematics period Törless was suddenly struck by an idea....
 Törless – 'I say, did you really, understand all that stuff?'

⁸ "In the 1906 the Austrian Robert Musil, one of the most important writers of the German language, published one of the masterpieces of the literature of this century" (D'AMBROSIO, 1985, p. 51).

⁹ It is important to resort to Ricoeurian reflections on this. The French philosopher states that "It is in response to questions such as: what are you doing, why, how and with what intention ?, that statements are produced in the form << I do this because, in view of, etc. >> The form of the statement is thus selected by the game of questions and answers and by the situation of this game within a broader game which is that of the very interaction by which the action of one responds to the action of the other. " (RICOEUR, 2013, p.45). It is important to note some distinctions established by Ricoeur (2013): "to distinguish the universe of discourse in which one speaks of the action of the universe of discourse in which one speaks of movement. The notion of reason belongs to the first, the notion of cause belongs to the second "(RICOEUR, 2013, p. 45); Ricoeur (2013) provides two examples that can help clarify this distinction: "Saying << I stretch my arm to show that I'm going to turn >> is to produce a statement that cannot be placed in the same category as the statement << the arm raises -se >>: this describes a movement, that an action; this describes a movement that is observed by a spectator, the second describes an action from the point of view of the agent who made it "(idem). Would Ubiratan D'Ambrosio be an external observer to all the action in history? The Brazilian writer-author proposes to comment on the reasons that lead the characters to certain actions in his story of the story; and he does it based on his speeches and, only based on the statements, he extracts the reasons that lead the characters to say that they act as they act and think as they think. Based on the dialogue of history, the writer-author infers an extra-textual (socio-historical) reality from the fictional reality of the world of Musil's text

Beineberg – ‘What stuff?’

Törless – ‘All that imaginary numbers.’

Beineberg – ‘Yes. It’s not particularly difficult, is it? All you have to do is remember that the square root of minus one is the basic unit you work with.’

Törless – ‘But that’s just it. I mean, there’s no such thing. The square of every number, whether it’s positive or negative, produces a positive quantity. So there can not be any real number that could be square root of a minus quantity.’

And the dialogue between the two colleagues proceed up to a breakdown. (D’AMBROSIO, 1985, p.52-53)

It is observed that the dialogues are outside their original context. In this sense, they become new dialogues. They are in a different context from the fictional history of origin (MUSIL, 2003). And in this case, it can be said that the fictional dialogue simulates a game between the writer and his potential reader mediated by the characters. It is, therefore, D’Ambrosio’s reading and interpretation of Musil’s work that guides the meaning that the reader will be able to extract from the inside of this game of questions and answers.

The writer, when composing his intrigue, clinging to fictional fragments from another world, makes certain choices, selects and organizes the material of which he appropriates. He acts like **editing**¹⁰ a film, making cuts, montages, reshaping the original context of the scene. D’Ambrosio (1985) interferes with the original by adding his comments or by removing entire passages. The gaps, the gaps, the intervals - “[...]” - inscribed in the text of the mathematical educator are not part of Robert Musil’s work and denounce the montage made on the original.

The montage of the scene in D’Ambrosio’s (1985) narrative also deconstructs the socio-cultural, ideological and political context of the original in which the story of the young Törless occurs. Decontextualize and recontextualize to compose the plot of the narrative. The editing and editing of the fictional scene in D’Ambrosio (1985) disregards the world in which the original plot unfolds¹¹.

The mathematical educator’s narrative, based on the fictional fragment, creates a romanticized version about the sharing of experiences between young people and adolescents in the socio-historical, empirical, real world by attesting to “the obvious identification of youth all over the world with their pairs” (D’AMBROSIO, 1985, p. 55). In the fiction about the fictional, something of the real is projected that, perhaps, cannot be effectively verified in the sociological, psychological or historical field.

¹⁰ “Here the notion of reality also begins to deconstruct, because the cut within the scene shows the same fact from another perspective, it demands a new vision, the ‘intellectual montage’ that Eisenstein will theorize in his works in the 1920s. the montage entering the scene, as the name implies, there is the rearrangement of the facts seen by the camera. The reality becomes more dispersed. [...] the cut within the scene as the inaugural act of cinematographic art” (LUCENA, 2009, p.116)

¹¹ In a Portuguese version of the work (MUSIL, 2003), many characterizations of the place where the plot unfolds are read, one of the first is the following: “It was a small train station, on the way to Russia” (p. 7).

9. Final considerations

The work signed by the mathematical educator opened a new path within Mathematical Education by dialoguing with fictional literature, cinematographic productions, new digital media, and a wide symbolic universe that surpasses that of mathematical education. It can even be said that D'Ambrosio's writings traced a line of flight on the map that existed until then in Mathematics Education. His work established an alternative route for explorers, researchers, students.

When creating a reality about the unreality of fiction, when narrating a story to come and enunciating a crisis, a moment of transition, and pointing to the probable apocalyptic end of the human being, the writer subverts and amplifies the facts of the socio-historical reality to, in his argument, to direct our thoughts and reflections towards another world, his own world materialized in his writings. Idealized, utopian, poetic world.

D'Ambrosio's Ethnomathematics, in its early years of creation, in its first moments of dissemination, in the 1980s and 1990s, is eminently part of a verbal creation - as, for example, ethnological ethnological + matem + tica creation - and, this creation, presents itself as a poetic solution to the problems enunciated in its own world. Orality and, therefore, rhetoric, mark the speeches inscribed in the narrative of the stories that emerge from the d'ambrosian's ethnomathematics.

The composition of the intrigue in D'Ambrosio presents a generic man, heir to a classic historical past, Greek, who grows in modernity and becomes a product of the technological advances that he himself creates. The beautiful and the ugly, the destruction and construction of the world, the good and the bad, dispute space in the plot of this story. Man must be involved ethically in this history of history in order to become the savior of man himself (traditional, obsolete, destructive, etc.). This man of technology, dependent on mathematics, peaceful, is also the one who will be able to save the entire planet. Mathematics and its teaching are understood in this context as the basis for all the changes necessary to promote global social well-being.

The plot woven into the narrative of the ethnomathematics text is still, in this section, a reflection of his time, heir to scientific modernity and the bourgeois utopian fictions that populate, directly or indirectly, the bourgeois fictional literary universe.

By creating a potential world, by moving towards a probable future, by activating the fictional field, it becomes possible for the writer to explore the non-existent from the past interpreted and enunciated in his text world. Retrospectively, when revisiting D'Ambrosio's ethnomathematical textual work, when locating the space-time of her production, it is noted that she did just that.

The way the mathematician narrates his stories of History, listing real and unreal characters, describing probable scenarios and painting a present and a past in decline, changing, in transition, contribute to the construction of new subjectivities in the context of research in Mathematics Education . New looks at old problems - the being of man, intersubjective relationships, man in society, the different ways of learning and teaching, etc.

Finally, his work was not limited to describing what was in front of his eyes, but, rather, he went beyond the limits of the factual and launched himself into the fabrication of a probable new world, inspiring and moving research.

References:

BAMPI, Lisete. **Governo etnomatemático: tecnologias do multiculturalismo**. 2003, 200f. Tese (Doutorado); Programa de Pós-Graduação em Educação, Faculdade de Educação, Universidade Federal do Rio Grande do Sul, Porto Alegre, 2003.

CARNEIRO, José Vanderlei. Hermenêutica da narrativa de ficção: a intriga como mediação do sentido. **Pensando, revista de Filosofia**. 4(8). p.72-102, 2013.

CIORAN, Émile Michel. **História e Utopia**. Tradução de José Thomaz Brum. Rio de Janeiro: Rocco, 1994.

BREDA, Adriana. **A Utilização da Etnomatemática nos Cursos de Formação Continuada de Professores: um Ensaio Analítico sobre a Produção de Subjetividades**. Dissertação (Mestrado) Programa de Pós-Graduação em Educação em Ciências e Matemática; Faculdade de Física, PUCRS. Porto Alegre, 2011.

CONRADO, Andréa Lunkes. **A pesquisa brasileira em etnomatemática: desenvolvimento, perspectivas, desafios**. 2005. Dissertação (Mestrado em Educação) Programa de Pós-graduação em Educación, Universidade de São Paulo. São Paulo: USP, 2005.

D'AMBROSIO, Ubiratan. **Socio-Cultural bases for Mathematics education**. Transcrição de uma palestra realizada pelo autor. São Paulo: UNICAMP, 1985.

D'AMBROSIO, Ubiratan. **Da realidade à ação: reflexões sobre Educação e Matemática**. São Paulo: Summus; Campinas: Ed. Da Universidade Estadual de Campinas, 1986.

D'AMBROSIO, Ubiratan. **Etnomatemática: Arte ou técnica de explicar ou conhecer**. São Paulo: Ática, 1990.

D'AMBROSIO, Ubiratan. **Educação para uma sociedade em transição**. Campinas: Papirus, 1999.

D'AMBROSIO, Ubiratan. **Etnomatemática: Elo Entre as Tradições e a Modernidade**. Coleção tendências em Educação Matemática, 4. Belo Horizonte: Autêntica, 2011.

FALCON, Francisco José Calazans. **Utopia e Modernidade. Morus: Utopia e Renascimento.** Campinas: Unicamp, 2005, n. 2, p. 161-184.

FANTINATO, Maria Cecília; FREITAS, Adriano Vargas (Orgs.). **Etnomatemática: concepções, dinâmicas e desafios.** Jundiaí: Paco, 2018. 232p.

FIRPO, Luigi. Para uma Definição de “Utopia”. **Morus: Utopia e Renascimento.** Campinas: Unicamp, 2005, n. 2, p. 225-237.

GERDES, Paulus. **Etnomatemática e Educação Matemática: Um panorama geral.** Revista Quadrante: Lisboa, 5(2), 105-138, 1996.

GERDES, Paulus. **Da etnomatemática a arte-design e matrizes cíclicas.** Coleção tendências em Educação Matemática. Belo Horizonte: Autêntica, 2010.

KERMODE, Frank. **The sense of an ending: studies in the theory of fiction.** New York: Oxford University Press, 2000.

KNIJNIK, Gelsa (et Al.). **Etnomatemática em movimento.** Coleção tendências em educação matemática, 25. Belo horizonte: Editora autêntica , 2012.

KNIJNIK, Gelsa. Itinerários da etnomatemática: questões e desafios sobre o cultural, o social e o político na educação matemática. In: KNIJNIK, Gelsa.; WANDERER, Fernanda; OLIVEIRA, Claudio José. (Org.). **Etnomatemática, currículo e formação de professores.** Santa Cruz do Sul: EDUNISC, 2004. p. 19-38.

LUCENA, Luiz Carlos. **Nem tudo é verdade (not everything is true) A construção do Real no Documentário Contemporâneo.** Ensaio base para dissertação de mestrado (2007). São Paulo: USP, 2009.

MARCHON, Fabio Lennon. **A Poética, a Retórica e a Narrativa do Mundo do Texto etnomatemático d’ambrosiano.** Tese (doutorado). Universidade Federal Fluminense. Faculdade de Educação. 2018. 266 p.

MARQUES, Paulo Sérgio. A poética do perfeito: elementos da narrativa utópica. **Revista FronteiraZ.** PUC-SP, 2009. p1-13. Disponível em <https://revistas.pucsp.br/fronteiraz/article/view/12464/9035> (visualizado em 14/08/2020)

MENEGHETTI, Francis Kanashiro. O que é um ensaio-teórico?. **Rev. adm. contemp.,** Curitiba , v. 15, n. 2, p. 320-332, Abril 2011 . Disponível em <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1415-65552011000200010&lng=en&nrm=iso>. Acesso em 03 de Julho de 2020.

MIARKA, Roger. **Etnomatemática: do ôntico ao ontológico.** Tese (doutorado). Universidade Estadual Paulista Júlio de Mesquita Filho, Rio Claro, 2011.

MOISES, Massaud. **A criação literária: poesia e prosa**. São Paulo: Cultrix, 2012. 317p.

MUSIL, Robert. **O Jovem Törless**. Coleção Biblioteca Folha, 27. São Paulo: Ed. Folha de São Paulo. 2003. 157p.

REUTER, Yves. **A análise da narrativa: o texto, a ficção e a narração**. Rio de Janeiro: Difel, 2014.

RICOEUR, Paul. **Interpretação e ideologias**. Tradução Hilton Japiassu. Rio de Janeiro: Francisco Alves, 1990.

RICOEUR, Paul. **A Memória, a história, o esquecimento**. Tradução Alain François [et al.]. Campinas, SP: Editora da Unicamp, 2007.

RICOEUR, Paul. **Teoria da interpretação: o discurso e o excesso de significação**. Lisboa: Edições 70, 2011.

RICOEUR, Paul. Entre tempo e narrativa: concordância/discordância. **Kriterion**, Belo Horizonte, v. 53, n. 125, p. 299-310, June 2012. Disponível em http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0100-512X2012000100015&lng=en&nrm=iso. Acesso em 03 de Julho de 2020.

RICOEUR, Paul. **Tempo e narrativa 1: A intriga e a narrativa histórica**. São Paulo: Martins Fontes, 2012a.

RICOEUR, Paul. **Tempo e narrativa 2: A configuração do tempo na narrativa de ficção**. São Paulo: Martins Fontes, 2012b.

RICOEUR, Paul. **Tempo e narrativa 3: O tempo narrado**. São Paulo: Martins Fontes, 2012c.

RICOEUR, Paul. **O Discurso da Ação**. Lisboa: Edições 70, 2013.

RICOEUR, Paul. **A Metáfora Viva**. Tradução Dion Davi Macedo. Coleção Leituras Filosóficas. São Paulo: Edições Loyola, 2015.

ROSA, Milton; OREY, Daniel Clark. **Fragmentos Históricos do Programa Etnomatemática**. In **Anais/Acta do 6o. Encontro Luso-Brasileiro de História da Matemática, 2014**, p.335-358.

SARGENT, Lyman Tower. What Is a Utopia? **Morus: Utopia e Renascimento**. Campinas: Unicamp, 2005, n. 2, p. 153-160.

TROUSSON, Raymond. Utopia e Utopismo. **Morus: Utopia e Renascimento**. Campinas: Unicamp, 2005, n. 2, p. 123-135.

WHITE, Hayden. **Trópicos do Discurso**: Ensaio sobre a crítica da cultura. São Paulo: Editora da Universidade de São Paulo, 2014;