Reflecting on our past and future: A book showcasing the work and life of Ubiratan D'Ambrosio and how it has affected us all

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Abstract

This first session Ubiratan D'Ambrosio will be based on the recently published book about D'Ambrosio (Borba and Orey, 2023a) with chapters written by many scholars from around the globe and edited by the two coordinators of this session. This book is prefaced by his son Alexandre D'Ambrosio. Authors from Brazil discussed the roots of ethnomathematics in D'Ambrosio fashion, showing, for example, the first master and doctorate degree of Mathematics Education; how D'Ambrosio interacted with graduate students. The book included his work in history of Mathematics. Finally, it shows how Ubi's work was not restricted to Brazil. It had great influence and Latin America and in the whole world. Moreover, the ethnomathematics program continues to expand after his death. The session will include the participation of invited scholars to react and contribute to the presentation by its coordinators.

Keywords: Ethnomathematics; Ubiratan D'Ambrosio; Janus; Trivium; Culture

This plenary session is named Ubiratan D'Ambrosio after this giant of Mathematics Education who unfortunately passed away on May 12, 2021. The CIAEM has wanted to honor the contribution and the academic and personal figure for the human team that constitutes the *CIAEM Community*.

CIAEM's aim is that all the following *Inter-American Conferences of Mathematics Education* will include a special *Session Ubiratan D'Ambrosio* with issues related to the themes that D'Ambrosio addressed.

Aims and agenda

On this occasion, this session will use as a base a recent book published by the Springer publishing house edited by D. Orey and M. Borba. Its aim is to indicate some of the ideas and perspectives of Ubiratan D'Ambrosio that are described in this publication, as well as information about the collaboration of this great Brazilian intellectual with other scholars in the development of Ethnomathematics, undoubtedly his greatest contribution to the Mathematics Education.

The session will have a first part (30 minutes) with a presentation by Orey and Borba on elements of the book they edited.

In another segment of the session there will be the intervention of selected scholars to refer to the previous presentation or aspects of D'Ambrosio work. This segment will last 10 minutes.

Finally, a space will be offered for questions and brief interventions from the public.

Elements of the presentation by Orey and Borba

In this presentation we will use the recently published book about D'Ambrosio (Borba and Orey, 2023a) written by many colleagues from around the globe and edited by the two authors of this presentation. We valued in the beginning the impact of D'Ambrosio on the two of us and we end by presenting a little of the ideas of our colleagues.

We began our introductory chapter in the book *Ubiratan D'Ambrosio and Mathematics Education: Trajectory, Legacy and Future* (Borba, & Orey, 2023b) with the quote: "As mathematicians and math educators we have responsibility towards issues of sustainability, climate change and pandemics, which are urgent." Ubiratan D'Ambrosio

The quote came from a paper, initially published in Portuguese (D'Ambrosio, 2018), where he foresaw the COVID pandemic in the paper, D'Ambrosio used more than once, the word pandemic in its plural form: pandemics. We have come through one pandemic after many before, and as he said, "many more to come". He wrote about how the power of the COVID pandemic, so drastically and rapidly changed the world we now live in. And we talked about, how like the Roman god Janus, we might consider using this opportunity to look both before us and into our mutual futures.

Ubi often used the example of the Roman god Janus, in his work.

> Janus, who the Romans named the first month of the year in his honor, would look back, and forth at the same time. Ubi, as one of the renown international specialists in the history of mathematics and who developed the program of ethnomathematics, he taught us to look back and then to the future, at the same time. From both his global and historical perspective, he described a certain tension between

> the past and future of humanity to address mathematics education in its current form. (Borba & Orey, 2023b, p. 2).

Modern technologies (mostly in relation to communication and information) have been highly influential in Mathematics Education in many countries. Ubiratan often talked about how the global transition from orality to writing marked many new roles and opportunities for educators. Together we transitioned from the sole repositories of knowledge, and became mentors, coaches, guides, and interpreters of knowledge. Ubiratan wrote how remarkable the emergence of writing strengthened our individual memories.

Professor D'Ambrosio both utilized and analyzed different forms of media across history to support the use of digital technologies in Mathematics Education. Mathematics Education in many places, is often presented as a dichotomy between humans and hardware. He often referred to both books and computer hardware, and incorporates new technologies, which allows us to glimpse into the future. It is from this exchange of ideas that he invented his Trivium (Rosa & Orey, 2015).

D'Ambrosio's Trivium model presents us with a curriculum model that can be used to identify pedagogical actions in the form of teaching–learning practices based on his "Program Ethnomathematics." The curriculum proposal is composed of literacy, matheracy, and technoracy, and supports diverse school activities based on both ethnomathematics and modelling.

In Ubiratan's three-point curriculum model, literacy is the capacity of students to process information present in their daily lives; *matheracy* is the capacity of students to interpret and analyze signs and codes in order to propose models and to find solutions to problems faced daily; and *technoracy* is the capacity of students to use and combine different instruments to solve increasingly complex problems. And of course, *numeracy* plays an important role in this curriculum model. (Borba & Orey, p. 2, 2023b)

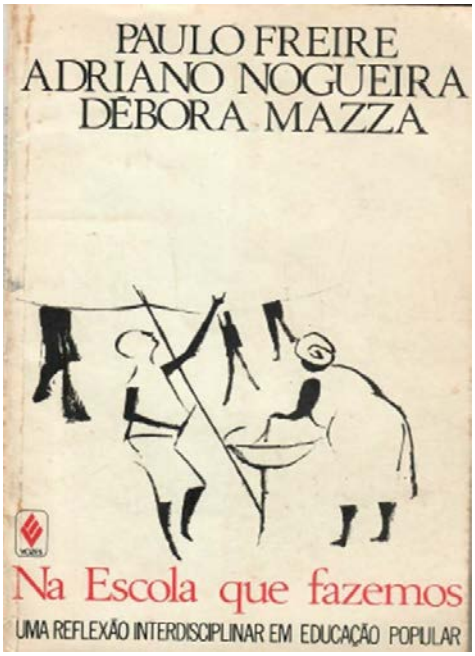
A Janus-Trivium influenced curriculum does not discard any view of education that values the past, it merely asks us to be more cognizant, aware, mindful, and flexible as new situations arrive. It asks us to think about what we teach and how it connects to where we might be going.

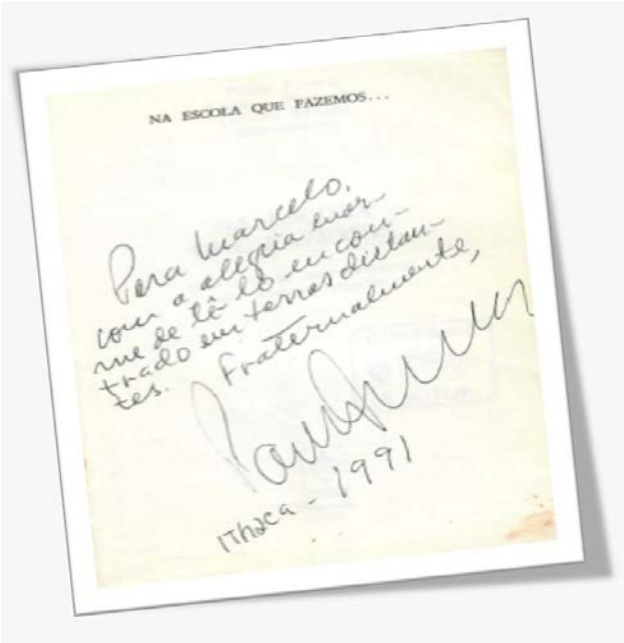
D'Ambrosio was cognizant that his work stood on the foundations built by many scholars such as Ascher & Ascher and Bishop. The Aschers wrote an ethnomathematical inventory of the Mathematics of traditional Andean people who developed the quipu. Ascher & Ascher presented strong evidence that the base 10 system was present hundreds of years ago in what is now called Latin America.

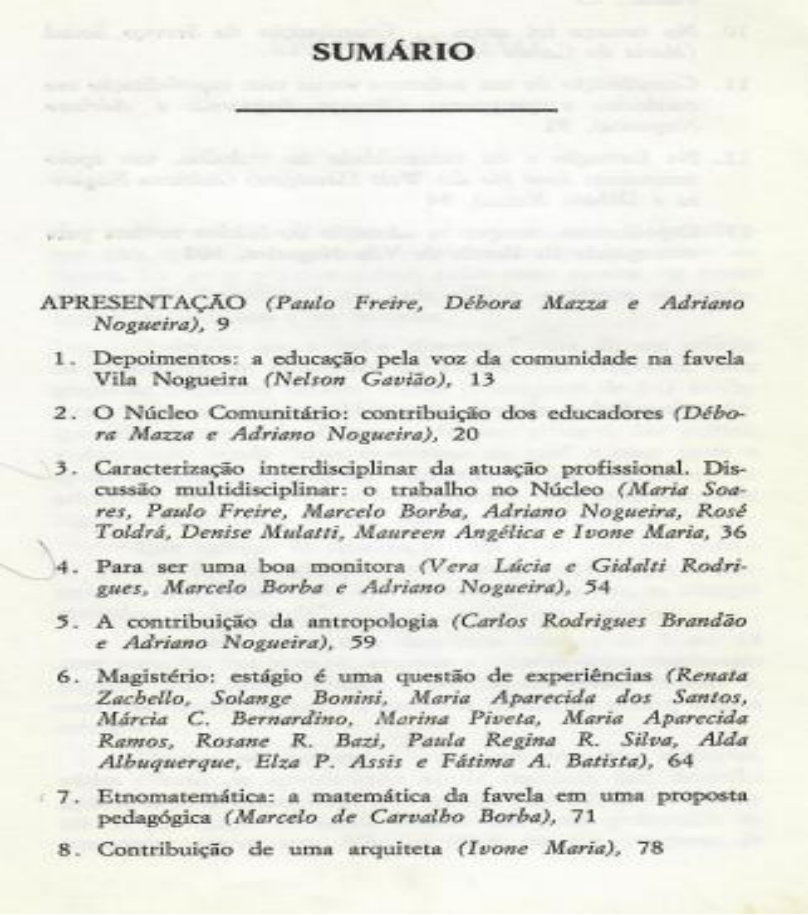
In the book, Professor Borba discussed how D'Ambrosio prepared his memorable talk of the ICME in Adelaide, Australia, in July 1984. This occurred while D'Ambrosio was teaching at the graduate program in Mathematics Education, at the Universidade Estadual Paulista (UNESP), Rio Claro. Professor Borba, as a young master's student, shared the excitement when Ubiratan gave a "pre-session" practice talk in which he first summarized ideas related to ethnomathematics.

Through dialogue with colleagues, Eduardo Sebastiani and Maria Viggiani Bicudo – professors of the graduate program at the Universidade Estadual de Campinas (UNICAMP) - Ubiratan continued to consolidate his ideas and designed a study which included long-term field work and participatory research in the favelas (slums) of Campinas. The study looked at the ethnomathematics of the community primarily composed of migrants from different regions of Brazil. Many residents were illiterate, in that the traditional forms of literacy were not apparent. The results of the project demonstrated that the members of the community were indeed "literate", even though their literacy was not in the traditional form. At the time, there were no mathematics educators on the team. Both Professors D'Ambrosio and Sebastiani, who were professors at UNICAMP, and taught in the graduate program at UNESP, made the connection so that Marcelo Borba became part of the team.

This profound concept: that poor or marginalized people know Mathematics that is used and expressed in a unique or particular manner, was an innovative concept for Mathematics educators in Brazil. Professor Borba's master thesis, the second one defended in the program, had professor D'Ambrosio as a member of the evaluating committee, and reported on the ethnomathematics of students regarding a vegetable garden project and the geometry of a soccer field. Besides his masters work a book was published by Paulo Freire and two of his doctoral students, in which Marcelo participated (Freire et al. 1998). Ubiratan was very happy indeed to see this developing connection with Paulo Freire's work.







SUMÁRIO

Figure 1. Cover of the book that with chapters on ethnomathematics and interdisciplinarity by Borba, Freire and colleagues.

Curiously, about the same time in 1986, Daniel Orey had returned to the United States from two years living and teaching in Guatemala to begin master's and doctoral work in New Mexico.

Orey's master's degree program at the New Mexico State University (NMSU) invited him to work on a project that allowed him to travel throughout New Mexico, Colorado, and West Texas giving people their first access to technology. This was a time when there was no Internet, and this type of research is impossible to replicate given the worldwide diffusion of smart phones and WIFI. During much internal conflict, he took the NMSU model back to Guatemala and worked in two schools there.

Shortly after Ubiratan's death, the two editors of this book were invited by Professor Gabriel Kaiser to organize a tribute to Ubiratan. Although much of ethnomathematics research is published and done in Brazil, the editors were encouraged to search for a broader, international perspective on Ubiratan's life and work. A call was sent out to numerous people who knew him, worked with him, or were mentored by him. What came about was a collection of perspectives on how our dear professor's life, research, writings, and love affected us all. The project allowed not just the editors, but as we soon learned, many of the authors as well, to reflect, grieve, mourn,

and then celebrate the life of our dear mentor. What brought not just the two editors but this group of scholars together is our mutual love for and work at adapting the teachings that Ubiratan encouraged in all of us. As we wrote in the book, "it has been our mutual experience, indeed our Janus moments in regard to technology, including research and interest in culture, technology and mathematics education." (Borba & Orey, 2023b, Borba and Villarreal, 2005).

We did have quite a few authors from Brazil, who discussed the roots of ethnomathematics in D'Ambrosio fashion, discussing carefully, for example, about the first master and doctorate degree of Mathematics Education or about how D'Ambrosio interacted with graduate students. D'Ambrosio has for the most part created the notion of a History of Brazilian Mathematics and influenced both history of Mathematics in Latin America and elsewhere as discussed in several chapters of the book. In another chapter, one may see how D'Ambrosio acted on the history of Mathematics and Mathematics Education: his personal archive is now being analyzed by professionals who will bring new light to the history of Mathematics Education.

Ubi, in a 2018 paper (D'Ambrosio, 2018) had predicted the pandemic that would arrive two years later and presented his search for a Mathematics for peace. He listed challenges that we had to overcome from a perspective of a Mathematics that has been used for war and violence. In other chapters is discussed how D'Ambrosio influenced and helped to create Critical Mathematics Education. The notion of ethnomathematics can be understood as a way of democratizing the production of Mathematics and one may see academic Mathematics, as "a" mathematic, that is, a form of expression of Mathematics, as an ethnomathematics, as suggested by Borba (1990). Much of this relation with critical Mathematics Education was built with colleagues from the USA, where he also developed and helped to found associations and groups related to ethnomathematics, as reported in a different chapter.

Yet another chapter helps to document the ethnomathematics movement in Brazil, with a virtual center that tries to retrieve initiatives and promote ethnomathematics in Brazil. We now have teacher mathematics education master's programs based on ethnomathematics for teachers of a state of the USA. In more than one chapter the relation of ethnomathematics to modelling is related, another movement promoted by him, in what we have called a "tapestry of trends in mathematics education" (D'Ambrosio & Borba, 2010).

Finally, the book discusses a "mystic" side of D'Ambrosio in which his political tone was always combined with facial expressions, and words that would make most of us stop and listen to him in a way that we usually do not listen to other people. The preface of the book, by Ubi's son opens the book with a facet not always valued when Ubi is the center: besides being an amazing speaker, he was a great listener! The book shows that ethnomathematics is the legacy of Ubi and is moving! There is discussion about ethno biomathematics, and about agency of things, of artefacts, a discussion that Ubi had developed for a long time with the authors of this paper.

Ubiratan wrote:

> Like Janus, the ancient Roman god whose double-faced head signified his knowledge of the present and the future, education has always been a two-faced enterprise. The past establishes goals and methods of education, and the other face tries to capture the future and suggests and proposes new directions of thought and new styles of action for the next generation who will in a few years, take

> over routines and societal innovation in the many diverse contexts worldwide. History tells us that this face of education has always been sensitive to emerging technologies. D'Ambrosio (2005)

We hope that this book does this.

The Janus story itself provides a perfect metaphor for how both collaborator-editors made vital changes or awakened to ethnomathematics and began to use it in their unique teaching, and research. As well, we saw as the book came together how this happened in all the authors. This is a common theme or thread of the authors found in the book.

To say the least, the passing of our dear professor, teacher, and mentor was a shock, but this exercise allowed us to join together and to heal our broken hearts together, and in the case of the editors rekindle an old friendship – something we think would make Ubiratan smile deeply. The organizers are two scholars: one born and raised in the north, and one in the south, educated in the opposite hemispheres, that because of their mutual mentor came together to bring a truly creative group of scholars to celebrate a life and work of our mutual mentor. This project provided all of us, the time we desperately needed to reflect and move forward after Ubi´s passing.

We can gain just a glimpse in the book of Ubiratan's dream for peace and how his plan for a *Programa Etnomatemática* has grown to become a worldwide phenomenon and it was both outlined by and encouraged by him to diversify along the many unique lines and cultural-national contexts. We are confident that this book accomplishes that goal.

The book presents one mutual, transnational Janus moment for all of us who take his teachings and seek in our own unique and beautiful contexts to apply them in different settings: ethnomathematics, culture in Mathematics and technology, and will manifest in the forces of social class, ethnicity, history, gender, and sexual orientation that influence ethnomathematics.

#UbiratanPresente
#ParasempreUbi

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