

The Intellectual Contributions of Ubiratan D'Ambrosio to Ethnomathematics¹

Patrick Scott

IACME Vice President

United States

pscott@nmsu.edu

Abstract²

Ubiratan "Ubi" D'Ambrosio is considered by many to be "the intellectual father of ethnomathematics". He defined and popularized the term as "the art or technique of explaining, knowing, and understanding diverse cultural contexts" (D'Ambrosio, 1990). He formed the International Study Group on Ethnomathematics (ISGEm) and has been instrumental in helping to make sure that the socio-cultural context of mathematics and its teaching and learning are considered in conferences, publications and the day to day work of thousands of mathematics education around the world.

Key words

Ubiratan D'Ambrosio, Ethnomathematics, Sociocultural Context.

Resumen

Ubiratan D'Ambrosio es considerado por muchos como el "padre intelectual de la Etnomatemática". Él definió y popularizó el término como "el arte o técnica de explicar, conocer y comprender los diversos contextos culturales" (D'Ambrosio, 1990). Formó el Grupo Internacional de Estudio sobre Etnomatemática (ISGEm) y ha sido fundamental en ayudar a cerciorarse de que el contexto socio-cultural de las matemáticas y su enseñanza y aprendizaje sean considerados en las conferencias, las publicaciones y el día a día del trabajo de miles de educadores matemáticos en todo el mundo.

Palabras clave

Ubiratan D'Ambrosio, etnomatemática, contexto sociocultural.

It is a great honor and privilege to be asked by the IACME XIII International Program Committee to participate in the Plenary Round Table on "The Intellectual Contribution of Ubiratan D'Ambrosio in Math Education" and particularly on his contribution to Ethnomathematics. The extent of this honor and privilege can be noted with a simple Google of Ubiratan D'Ambrosio. As I work on this paper on April 30, 2011, I get 157,000 hits. To limit the search I try D'Ambrosio Ethnomathematics and get 5,820 hits. Although many of those are specifically references to Ubi's works, I notice that many of them are in effect other authors essentially writing on his contributions to

¹ Este trabajo corresponde a una mesa plenaria realizada en la XIII CIAEM, celebrada en Recife, Brasil el año 2011.

² El resumen y las palabras clave en español fueron agregados por los editores.

Ethnomathematics. By changing Ethnomathematics to Etnomatemáticas in order to get results for Portuguese and Spanish there are 9,180 hits. Curiously (and beyond the scope of this paper and my expertise) by taking the s off of the end of Etnomatemáticas there are only 7,490 hits.

Many in the field consider Ubiratan D'Ambrosio to be "the intellectual father of Ethnomathematics". Ubi himself, with typical humility, gives credit for the first use of the term "Ethnomathematics" to others:

I recently learned from Claudia Zaslavsky that Otto Raum wrote, in a review of her book, published in *African Studies* (1976): "(This Mathematics) might perhaps be most suitably called ethno-maths on the analogy of ethno-music, ethno-semantics, etc." And Wilbur Mellerna, in a letter to Gloria Gilmer, published in the NEWSLETTER of the ISGEM (vol.6,n.1, November 1990), says that he had invented the word ethnomathematics in 1967 and that he gave a talk in 1971 using it (D'Ambrosio, 2004).

Ubi has often written that for him a seminal moment in his development of the concept of Ethnomathematics was the organizing of a Panel on "Why Teach Mathematics" for the Third International Congress on Mathematics Education (ICME-3) in 1976 in Karlsruhe, Germany, and the subsequent publication of his related paper on "Overall Goals and Objectives in Mathematics Education" (D'Ambrosio, 1979). He used that forum to insist that, in justifying why mathematics should be in the school curriculum, discussions on the nature of mathematical knowledge needed to give attention to history, philosophy and cognition beyond those traditionally focused on the history of mathematics and the learning of mathematics. Also very importantly, he introduced emphatically the idea that there are other ways of doing mathematics that emerge in different cultures.

Ubi indicates (D'Ambrosio, 2004) that in 1978 at the annual meeting of the American Association for the Advancement of Science in a section organized by Rayna Green on "Native American Science", in a paper that was not published, he first used the "the words ethnoscience and ethnomathematics to designate scientific and the mathematical knowledge and practice of the Native American cultures. These words were mainly focusing extant practices of peoples marginalized by the colonial process." The concept of Ethnomathematics further developed in his thinking as he contemplated a holistic concept of curriculum, and how mathematics was related to society and to culture in general. As he has put it, by 1984 "the ground was prepared" (D'Ambrosio, 2006).

In his plenary lecture at the 1984 ICME 5 in Adelaide, Australia, he presented the theory and examples that led to his now famous conceptualization of Ethnomathematics as Ethno [culture] + mathema [explaining, understanding] + tics [techné, arts, techniques] (D'Ambrosio, 1985). "Thus, we can say that ethnomathematics is the art or technique of explaining, knowing, and understanding diverse cultural contexts" (D'Ambrosio, 1990).

Perhaps the next phase in Ubi's development of Ethnomathematics was his creation of the International Study Group on Ethnomathematics (ISGEM). To recount how that was accomplished I will reproduce below what I wrote for the first edition of the *ISGEM Newsletter* (ISGEM, 1985).

At the 1985 NCTM Annual Meeting in San Antonio, a few of us lingered after Jeremy Kilpatrick's talk on "Research in Mathematics Education around the World." Ubiratan D'Ambrosio snagged three of us and asked if we would like to attend a short meeting. Unsure of just what he had in mind, we nevertheless eagerly followed him. We found an unoccupied meeting room and got down to business.

On various occasions we had listened to Professor D'Ambrosio's talks on Ethnomathematics. We had just heard Professor Kilpatrick emphasize the importance of Ethnomathematics and been impressed by the keynote address given two nights before at the research pre-session by Alan Bishop of Cambridge University on "The Social Dimensions of Mathematics Education in Research." Prof. D'Ambrosio explained that he felt the concept of Ethnomathematics had generated enough interest that it was time to form a study group. We readily agreed and eagerly began to plan some initial activities.

It was decided we would publish a newsletter to serve as a vehicle for communication of thoughts and projects on Ethnomathematics. Each member of the initial Advisory Board would put together a mailing list of colleagues whom they knew were interested in Ethnomathematics. Plans were made to arrange for special sessions on Ethnomathematics at the InterAmerican Mathematics Education Conference in Guadalajara, Mexico, in November, and at the next NCTM annual meeting.

Gloria Gilmer of Coppin State College agreed to serve as the first Chair of the newly formed group. Rick Scott of the University of New Mexico took on the responsibility of editing the first Newsletter. [Ubi and Gil Cuevas (then at the University of Miami) rounded out the initial ISGEm Advisory Board.]

ISGEm continued to meet every year at the NCTM Annual Meeting under Ubi's guidance. Presentation and panels on Ethnomathematics and cultural influences on mathematics teaching and learning became regular features at national, regional and international conferences. In 1996 the first International Congress on Ethnomathematics (ICEM I) was held in Granada, Spain, in 1998. It has continued every four years with ICEM II in Ouro Preto, Brazil, in 2002, ICEM III in Auckland, New Zealand, and ICEM IV in Towson, Maryland, USA in 2010 (<http://icem-4.org/>). Ubi's presence has been actual in many of these events and felt in all of them!

By the 1990s Ethnomathematics was supported by an ISGEm website (<http://isgem.rpi.edu/>) and an Internet discussion list (isgem@nmsu.edu).

In the late 1990s the North American Study Group on Ethnomathematics (NASGEm) was formed as an ISGEm Chapter and continues to meet at the NCTM Annual meeting. Other ISGEm Chapters now include the Seção Brasileira do International Study Group on Ethnomathematics (BR.ISGEm)

- <http://docente.saofrancisco.edu.br/isgem/>

and the Southern African Ethnomathematics Study Group (SAEmSG)

- <http://www.rpi.edu/~eglash/isgem.dir/texts.dir/SAEmSG.htm>.

The *ISGEm Newsletter*, which often had contributions from Ubi, morphed into the *Journal of Ethnomathematics* and then the peer-reviewed *Journal of Mathematics and Culture* (<http://nasgem.rpi.edu/pl/journal-mathematics-culture-s37>).

Ubi was awarded the ICMI Felix Klein medal in 2005. In the Citation for that award it is stated that "As a result of his interest in the social and cultural conditions for mathematics education, in particular as regards the nature of mathematical knowledge in different cultures at different times, Ubiratan D'Ambrosio began to develop what is internationally his best-known contribution to the field of mathematics education, the idea of ethnomathematics." And further that "Since its inception, ethnomathematics has continued to grow as a field of research and development and has exerted considerable influence on mathematics education in several continents, above all in Latin America and Africa" (ICMI, 2006).

Ubi has helped many of us to understand "'Ethno' in a much broader sense than merely race" ... "Our conception of "Ethno" encompasses all the ingredients that make up cultural identity of a group: language, codes, values, jargon, beliefs, food and dress habits, physical traits and so on" (D'Ambrosio, 1987). He has always insisted that Ethnomathematics is "a research program in the history and philosophy of mathematics with pedagogical implications" (D'Ambrosio, 2006).

Perhaps Ubi's greatest intellectual contribution to Ethnomathematics should be considered to be his intellectual contribution through Ethnomathematics. He has given us a vision of how mathematics and mathematics education can contribute to "a civilization for all, in which iniquity, arrogance and bigotry have no place" (D'Ambrosio, 2006).

Bibliographic references

- D'Ambrosio, U. (1979). Overall goals and objectives of mathematics education. In: *New Trends in Mathematics Teaching IV*. UNESCO/ICMI, Paris, pp. 180-198.
- D'Ambrosio, U. (1985). *Socio-cultural bases for mathematics education*. Sao Paulo: UNICAMP, Campinas.
- D'Ambrosio, U. (1990). *Etnomatemática: Arte ou técnica de explicar e conhecer*. Sao Paulo, Brazil: Editora Atica. (Translated into English as *Ethnomathematics: The art or technique of explaining and knowing* by ISGEm.)
- D'Ambrosio, U. (2004). A reflection on Ethnomathematics: Why teach Mathematics? Retrieved April 30, 2011, from <http://vello.sites.uol.com.br/why.htm>.
- D'Ambrosio, U. (2006). The scenario 30 years after. Retrieved April 30, 2011, from <http://www.math.auckland.ac.nz/Events/2006/ICEM-3/1.Keynote/D%27Ambrosio-plenary-prez.ppt>.
- ICMI - International Commission on Mathematics Instruction (2006). Citation for the 2005 ICMI Felix Klein Medal to Professor Ubiratan D'Ambrosio. *ICMI Bulletin*, 58, 8-10.
- ISGEm. (1985). The formation of ISGEm. ISGEm Newsletter, 1, 1. Retrieved May 3, 2010 from <http://web.nmsu.edu/~pscott/isgem11.htm>.

Appendix A

An Incomplete Bibliography of Works of Ubiratan d'Ambrosio on Ethnomathematics

One way to measure his intellectual contribution is through the quantity and quality of his publications related to Ethnomathematics. Below is a first attempt at bibliography of such work.

- D'Ambrosio, U. (1976) Objectives and goals of mathematics education, *Proceedings of the 3rd International Congress of Mathematics Education*, Karlsruhe, Germany (Paris: LINES CO, 1979).
- D'Ambrosio, U.(1977). Science and Technology in Latin America during its discovery. *Impact of Science on Society*, 27(3), 267-274.
- D'Ambrosio, U. (1979). Overall goals and objectives of mathematics education. In: *New Trends in Mathematics Teaching IV* . Paris: UNESCO/ICMI, pp. 180-198.
- D'Ambrosio, U. (1980). Mathematics and society: Some historical and pedagogical implications, *International Journal of Mathematics Education in Science and Technology*, 11(4), 479-488.
- D'Ambrosio, Ubiratan (1980). Uniting reality and action: a holistic approach to mathematics education, in *Teaching Teachers. Teaching Students* edited by L.A. Steen & D.J. Albert, Boston: Birkhauser, pp. 33-42.
- D'Ambrosio, U. (1985). Ethnomathematics and its place in the history and pedagogy of mathematics. *For the Teaching and Learning of Mathematics*, p. 44-48.
- D'Ambrosio, U. (1985). *Socio-cultural bases for mathematics education*. Sao Paulo: UNICAMP, Campinas.
- D'Ambrosio, U: (1985). Mathematical education in a cultural setting, *International Journal of Mathematics Education in Science and Technolovg*, 16(4), 469-477.
- D'Ambrosio, U. (1985). A methodology for Ethnoscience: The need for alternative epistemologies. *Theoria Segunda Epoca* (San Sebastian), 1(3), pp.397-409.
- D'Ambrosio, U. (1986). Matematica per paesi ricchi e paesi poveri: analogie e differenze, *L'Educazione Matematica* (Cagliari), 1(2), 187-197.
- D'Ambrosio, U. (1986). Culture, cognition and science learning. In J.J. Gallager & G. Dawson (eds.), *Science education and cultural environment in the Americas* (pp.85- 92). Washington: NSTA/NSF/OAS.
- D'Ambrosio, U. (1986). Some reflections on the western mode of thought. In Eiji Hat- tori (Ed.), *Science and the boundaries of knowledge: The prologue of our cultural past* (Final Report of Venice Symposium). Paris: UNESCO.
- D'Ambrosio, U. (1987). Reflections on Ethnomathematics. *ISGEm Newsletter*, 3(1), 3-4.
- D'Ambrosio, U. (1988). A research program in the history of ideas and cognition. *ISGEm Newsletter*, 4(1), 5-7.
- D'Ambrosio; U. (1988). *Da realidades a acao: Reflexoes sobre educação matemática*, Summus Editorial, Sao Paulo, 1986 (2a. edicao 1988).
- D'Ambrosio, U: (1988). Socio-cultural influences in the transmission of scientific knowledge and alternative methodologies. *Cuadernos de Quipu*, 2, 25-133.

- D'Ambrosio, U. (1990). *Etnomatemática: Arte ou técnica de explicar e conhecer*. Sao Paulo, Brazil: Editora Atica. (Translated into English as *Ethnomathematics: The art or technique of explaining and knowing* by ISGEM.)
- D'Ambrosio, U. (1991). Ethnomathematics and its place in the history and pedagogy of mathematics. In Harris, M. (ed.) *School mathematics and work*, London: Falmer Press, p.
- D'Ambrosio, U. (1993). Etnomatemática: Um programa. *Educação Matemática*, 1(1). 1993.
- D'Ambrosio, U. & Ascher, M. (1994). Ethnomathematics: A dialogue. *For the Learning of Mathematics*, 14(2), 36-43.
- D'Ambrosio, U. (1996). *Educação matemática: Da teoria a prática*. Campinas, Brazil: Papyrus.
- D'Ambrosio, U. (1997). Preface. In: Powell, A. & Frankenstein, M. *Ethnomathematics: Challenging Eurocentrism in Mathematics Education*. New York: SUNY Press.
- D'Ambrosio, U. (2003). Stakes in mathematics education for the societies of today and tomorrow, *Monographie de L'Enseignement Mathématique* (39), 301-316
- D'Ambrosio, U. (2004). A reflection on Ethnomathematics: Why teach Mathematics? Retrieved April 30, 2011, from <http://vello.sites.uol.com.br/why.htm>.
- D'Ambrosio, U. (2006). The scenario 30 years after. Retrieved April 30, 2011, from <http://www.math.auckland.ac.nz/Events/2006/ICEM-3/1.Keynote/D%27%20Ambrosio-plenary-prez.ppt>.

To keep up with Ubi's publications at his website go to:
<http://vello.sites.uol.com.br/ubi.htm> .