ISGEm Newsletter

International Study Group on Ethnomathematics

Volume 18 **Number 1** **August 2020**

Editor: Milton Rosa

WELCOME!

Dear Colleagues,

ISGEm Executive Board (EB) members were elected in January, 2020. Since then, members of the EB have been working to revitalize ISGEm. We are having regular meetings via *GoogleMeet* to discuss actions that can be taken in the short, medium, and long term goals.

Short Term Goals: The EB is updating the ISGEm website and restarting the publication of the ISGEm Newsletter. The members of the EB would like to thank Ron Eglash for his support in helping us to update ISGEm website. Please, visit the ISGEm website at: *https://isgem.wordpress.com/*.

Medium Term Goals: The EB discussing the ISGEm constitution and the role of the *Journal of Mathematics and Culture* and its improvement. As well we are updating the ISGEm contact list members and developing a facebook page.

Long Term Goal: The EB is discussing the possibilities of associating ISGEm with the *International Commission on Mathematical Instruction* – ICMI.

This edition is the first Newsletter published by the new ISGEm EB. It is also the celebration of the ***35th Anniversary of ISGEm!*** Members of the EB are also going to keep the ISGEm goal of publishing two issues a year: May and November starting at 2021.

If you would like to collaborate with the ISGEm Newsletter, please send your contribution by November 15th 2020 for the publication of the next issue in December 2020. Articles (2-pages maximum), book reviews, information about conferences, study groups, ongoing research, meetings, journals, and others (1-

page maximum) that are related to investigations in ethnomathematics and the cultural aspects of mathematics.

Submissions and correspondences can be sent by email to the e-mail address: submissionisgem@gmail.com.

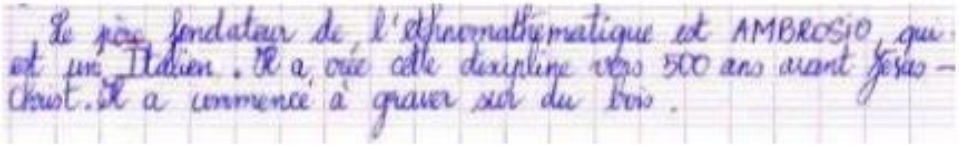
Best regards,

ISGEm Executive Board

35TH ISGEM ANNIVERSARY CELEBRATION

Here, we present three articles that celebrate the 35th ISGEm Anniversary.

Before 1985
Ubiratan D'Ambrosio
São Paulo, Brazil


Le père fondateur de l'ethnomathematique est AMBROSIO, qui est un Italien. Il a crée cette discipline vers 500 ans avant Jésus-Christ. Il a commence à graver sur du bois.

Le père fondateur de l'ethnomathematique est AMBROSIO, qui est un Italien. Il a crée cette discipline vers 500 ans avant Jésus-Christ. Il a commence à graver sur du bois.

By a student of New Caledonia (sent by Nadja and Jean-Claude Regnier)

I will not talk about the 35 years that passed since the inauguration of the ISGEm. This is well reported in the full collection of the *Newsletter of the ISGEm* and in other articles that comprise this 35 years commemorative volume. Instead, I will focus on what we might call the pre-history of Ethnomathematics.

It is difficult for me to remember when the ideas of Ethnomathematics began to enter my mind. Probably in my mission for SUNY at Buffalo to recruit Black students in Southern colleges in the USA, in the late 60s. Or most probably in my missions for UNESCO in the Republic of Mali, in the early 70s.

The word Ethnomathematics I used for the first time in a meeting of the *American Association for the Advancement of Science* (AAAS), in Washington DC, in 1978, where Rayna Green organized a section on *Native American Science*. In my talk, which was never published, I used the word ethnomathematics, similarly to what other participants were doing with their other disciplines, to designate the mathematics of the native cultures. In the previous year, in the journal *Impact of Science on Society*, of UNESCO, I used the word Ethnoscience.

But, the use of the word Ethnomathematics in this talk and other papers and talks was focused on the description of the mathematics of other cultures, mainly those without writing and those marginalized

by the colonial process. I reflected upon what might be the cognitive processes that led these people, as well as Western cultures, to generate behavior and knowledge.

Then, in 1978, during the ICM/International Congress of Mathematicians, in Helsinki, Finland, a curiosity came to my mind. I was curious about how Finish people would express the idea of generating behavior, ways of doing, and knowledge, ways of knowing, in their language. Freely playing with a Finnish-English dictionary, just for fun, I composed the word *alustapasivistykselitys* to satisfy my curiosity. Bizarre! But this playing with foreign roots to compose a word encouraged me to try the same exercise looking for Greek roots instead of Finnish.

Thus, committing an *abus d'étimologie*, I constructed the word Ethnomathematics, combining the roots *ethno* (meaning the natural, social, cultural and imaginary environment) + *mathema* (meaning explaining, learning, knowing, coping with) + *tics* (a simplified form of *techné*, meaning modes, styles, arts and techniques). The word meant I was trying to express the *tics* of *mathema* in distinct *ethnos*. Rearranging this sentence, we get *ethno+mathema+tics*, which leads naturally to the conceptual neologism Ethnomathematics. This is how I arrived to the conceptual word Ethnomathematics as a theoretical reflection on the generating behavior, that is ways of doing, and knowledge, that is ways of knowing, in different cultural environments.

Then, in 1984, came the memorable invitation to give a plenary conference in the opening session of ICME-5/Fifth International Congress of Mathematics Education, in Adelaide, Australia. I gave a talk on "Socio-Cultural Bases for Mathematics Education" and the word Ethnomathematics was openly spelled and presented, with its conceptual basis and many examples. The reaction of the audience was mixed. I was told that some participants ostensibly left the theater when I showed pictures of native workers using a mathematics of their own.

Next year, in the NCTM Annual Meeting in San Antonio, TX, I invited a number of colleagues to get together for a short meeting, in an unoccupied meeting room and got down to business. Indeed, this invitation was encouraged by listening the talk by Jeremy Kilpatrick and also in the keynote address given two nights before at the research pre-session by Alan Bishop on *The Social Dimensions of Mathematics Education in Research*. Both clearly recognized Ethnomathematics as an important option for mathematics education.

This was an indication that it was time to form a study group on Ethnomathematics. Those who accepted my invitation readily agreed with this and we started to plan some steps to launch a study group. It was decided to publish a newsletter to serve as a vehicle for communication of thoughts and projects on Ethnomathematics. It was necessary to put together a mailing list of colleagues whom we knew were interested in Ethnomathematics. Plans were made to arrange for special sessions on Ethnomathematics at the *InterAmerican Mathematics Education Conference*, in Guadalajara, Mexico and at the next NCTM annual meeting.

A first Advisory Group, for the new International Study Group on Ethnomathematics/ISGEm, was formed and Gloria Gilmer, of Coppin State College, Baltimore, MD, USA, agreed to serve as the first Chair of the newly formed group. Other members were Gilbert J. Cuevas, Coral Gables, FL USA, Ubiratan D'Ambrosio, Campinas, SP, BRAZIL and Patrick (Rick) Scott, Albuquerque, NM USA, who took on the responsibility of editing the Newsletter, in two versions, English and Spanish.

The Newsletter was decisive in keeping together the ISGEm. It was planned to be published twice a year. Interested mathematics educators were encouraged to contribute concept papers, information

on research in Ethnomathematics, particulars on relevant professional meetings, book reviews, annotated bibliographic entries are particularly solicited, and any ideas for promoting the study of Ethnomathematics. Thus, ISGEm was born in 1985.

The International Study Group on Ethnomathematics (ISGEm)[1]

Daniel Clark Orey
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Ouro Preto, Minas Gerais, Brazil

At the 63rd *Annual Meeting of the National Council of Teachers of Mathematics* (NCTM), held in 1985, in San Antonio, Texas, United States, participants Gloria F. Gilmer, Patrick Scott, Gilbert J. Cuevas, and Ubiratan D'Ambrosio, remained after the closing of Jeremy Kilpatrick's lecture entitled: Research in Mathematics Education Around the World in order to hold a brief meeting. Then these educators found an unoccupied meeting room and started to work.

On several occasions, the participants listened to Professor D'Ambrosio's lectures on the development of ethnomathematics. They had just heard from Professor Kilpatrick who emphasized the importance of Ethnomathematics, as well as they were impressed by the lecture entitled *The Social Dimensions of Mathematics Education* given by Alan Bishop, from the University of Cambridge, in the research pre-session, in the previous two nights of the conference.

In this meeting, Prof. D'Ambrosio explained that the concept of ethnomathematics had already generated a vigorous interest in the academic community and, thus, it would be important to create a study group. These participants readily agreed and began to plan the group's initial activities.

Then, it was decided that these participants would publish a newsletter to serve as a vehicle for communicating thoughts and projects in ethnomathematics. Thus, initially, each member of the Advisory Council would gather a discussion list of colleagues who would be interested in ethnomathematics. Consequently, plans were drawn up to provide sessions on ethnomathematics at various international congresses, such as, for example, the *Interamerican Conference on Mathematical Education* (CIAEM) and *NCTM*.

For this study group, Gloria Gilmer from *Coppin State College* agreed to serve as its first President and Patrick Scott from The University of New Mexico took on the responsibility of editing the first Newsletter. According to the initial plans proposed by the group members, the newsletter would be published twice a year.

The initial ISGEm Advisory Board was composed of Gloria F. Gilmer (United States), Gilbert J. Cuevas (United States), Ubiratan D'Ambrosio (Brazil), and Patrick Scott (United States). Thus, in 1985, ISGEm was created, which launched the Program Ethnomathematics internationally.

In this first phase of its history, ISGEm sponsored participation and meetings at the *Annual Conferences of National Council of Teachers of Mathematics* (NCTM), at the International Congress on Mathematical Education (ICME). In 1990, ISGEm became an affiliate of the *National Council of Teachers of Mathematics* (NCTM) in the United States.

[1]Text adapted from an opening essay from ISGEm Newsletter, Volume 1, Number 1, August 1985.

In these 35 years since ISGEm was created, there have been five presidents of this study group: Gloria F. Gilmer (from August 1985 to July 1996), Ubiratan D'Ambrosio (from July 1996 to July 2000), Paulus Gerdes (from July 2000 to November 2014), Maria Luis Olivera Contreras (from November 2014 to July 2018), Lawrence Shirley (Interim President from July 2018 to January 2020), and currently, Milton Rosa (as from January 2020).

In this context, it is important to emphasize that, in 1985, the *International Study Group on Ethnomathematics* (ISGEm) launched the Program Ethnomathematics internationally.

ISGEm at 35

Lawrence Shirley
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The International Study Group on Ethnomathematics (ISGEm) is 35 years old in 2020. That is older than many of the new ethnomathematics researchers! Already they are making sure the field continues with solid research and serious recognition of how ethnomathematics can guide policy in education, government, and social justice.

This is a good time to pause to see what has been happening over the past third of a century and to think about where ethnomathematics is going. Ethnomathematics as a field partly grew out of history of mathematics. Sometimes I have worked as a historian, and since I have recently retired, I have been reflecting on history - my own history, but also the history of ethnomathematics. Hence, this is an opportunity for a bit of a review.

Recent months have seen calls for *Black Lives Matter*, part of which includes recognition of history that has often been overlooked, the achievements and struggles of underrepresented peoples around the world. In the 1960s, similar campaigns for civil rights, justice, and representation were active in the United States and in other countries. Many newly independent nations around the world were breaking out from the bonds of imperialist colonialism and seeking similar recognition. These movements usually centered on public action and government response, but they also caused new thinking in culture, science, and education. Notably, new school curricula were becoming more inclusive.

An example that influenced me was *Africa Counts* by Claudia Zaslavsky, reporting informal research she had done in several African countries, finding examples of mathematical thinking that could be transferred into school mathematics content. Researchers in anthropology also reported mathematical thinking from several non-European countries. One thought-leader who took a more philosophical view - even political, was Ubi D'Ambrosio (who is also writing in this issue). He had earlier discussed the social responsibilities of scientists and mathematicians. In 1984, he was invited to explain this thinking as a plenary speaker at the *Fifth International Congress on Mathematical Education* (ICME-5). His remarks were so well-received that, for the Sixth ICME four years later, one full day of the conference was devoted to social-cultural issues in mathematics education. Those years in the mid-1980s are usually considered the beginnings of the field of ethnomathematics.

Meanwhile, several American mathematics educators at the 1985 meeting of the *National Council of Teachers of Mathematics*, took up Ubi's challenge and organized the *International Study Group on Ethnomathematics - ISGEm*. The organization's name was *International* since ethnomathematics is a world-wide phenomenon, and several international educators participated in that first meeting. Some scholarly organizations are called *Societies* to indicate a gathering of experts in the field. The ISGEm organizers instead chose the term *Study Group*, modestly stating that they gather to study and learn from each other about this new academic field. Thirty-five years later, the study process continues.

The American ethnomathematicians met every year at NCTM conferences, usually to handle organizational business, to hear updates on members' research, and, often with a guest speaker. Meanwhile, ethnomathematicians in other countries also began gathering and even organizing local conferences. Soon the American group was reformulated as the *North American Study Group on Ethnomathematics* (NASGEm), the North American branch of the overall *International Study Group*. An international Board became the administration of ISGEm.

In the late 1990s, there was growing interest in holding an international conference. Finally, Maria Luisa Oliveras took the initiative and invited all ethnomathematicians to the *First International Conference on Ethnomathematics* (ICEm-1), in Granada, España in 1998. This initiated the pattern of holding ICEm meetings every four years (in 2*mod*4 year numbers, World Cup years!) avoiding clashes with the similarly quadrennial (0*mod*4) ICMEs. The ICEms are the biggest activities of ISGEm, with conferences held in Ouro Preto, Brasil in 2002, Auckland, New Zealand (*Aotearoa*) in 2006, Towson, Maryland USA in 2010, Maputo, Moçambique in 2014, and Medellín, Colombia in 2018. We now anticipate ICEm-7 in Papua-New Guinea in 2022. Also, several countries now hold national conferences on a regular basis.

Ethnomathematics researchers publish in many journals of mathematics and mathematics education, but there are two specific ethnomathematics journals. *The Journal of Mathematics and Culture* is produced by NASGEm, and *La Revista Latinoamericana de Etnomatemática* from Red Internacional de Etnomatemática. Both offer several issues per year, now mostly in online format.

The Board of ISGEm ran into logistical difficulties for holding elections around 2010, so the old Board remained in office. Finally, elections were organized in 2019, and in January, 2020, an entirely new Board was elected, under the President, Milton Rosa of Brasil. The first task of ethnomathematics is to learn about interactions of culture and mathematics around the world, and much research reports such interactions. However, ethnomathematics is not just an anthropology of mathematics; rather, it looks at how cultural models and examples can be incorporated into school mathematics and how entire curricula and instructional practice can reflect local applications of mathematics.

Some early ethnomathematics research came from people who worked in international and cross-cultural settings and tried to highlight mathematics that had been held back by neglect and oppression. Philosophical studies in ethnomathematics also demonstrate cultural mathematical relationships that have been blocked or ignored. In recent months, there has been a new surge in concerns for oppressed and left-out peoples. As ISGEm and ethnomathematics in general move on past this thirty-fifth anniversary, the challenges of these times fit into the underlying objectives of ethnomathematics. It is time for ISGEm to answer this call.

Greetings from NASGEm

Tod Shockey
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It is a pleasure to write ISGEm on behalf of the *North American Study Group on Ethnomathematics* (NASGEm). Since the wonderful Congress held in Medellin, in 2018, NASGEm has been busy. The *Journal of Mathematics and Culture* (JMC) is hosted by NASGEm. The Journal is open access with an editorial board that considers submissions in Arabic, English, Italian, Portuguese, and Spanish. We are delighted with submission from about the globe and encourage readers to consider a submission. If you are advising graduate students, please understand that we want to support them in the publication efforts.

For readers that are working with new faculty, those in the first five years of the profession, please encourage them to take a look at JMC to determine if it is a fit for the scholarship. We are currently working on a focus issue for JMC, guest edited by Dr. Tamsin Meaney, on Culture and Mathematics Apps. In 2019 NASGEm compiled and published its first book: *Culture that Counts: A Decade of Depth with the Journal of Mathematics and Culture*. This book was motivated by many in the ethnomathematics community seeking classroom resources. We feel this is a rich compilation of work from an international group of colleagues.

Dr. Myrdene Anderson of Purdue University, USA, has organized an ethnomathematics section for the upcoming Springer publication, Handbook of Cognitive Mathematics. This Handbook is being

edited by Dr. Marcel Danesi with an expected publication date in late 2021. As we resituate ourselves in the *new* world, let us celebrate achievements. Medellin was a grand opportunity to meet new scholars, make new friendships, and renew friendships. Please share with us the important work you are doing. We would love to hear about activities of your students and want to be sure your students are aware of the Journal of Mathematics and Culture. Sending you peace from the North American Study Group on Ethnomathematics.

ARTICLES

Ethnomodelling as a Glocalization of Mathematical Practices

Milton Rosa
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The acquisition of both *local* (emic) and *global* (etic) knowledge is an alternative goal for the implementation of ethnomodelling research. Local knowledge is essential for an intuitive and empathic understanding of mathematical ideas and procedures developed throughout history. Global knowledge is essential for the achievement of cross-cultural communication that demands analytical standard units and categories.

Glocal (dialogic) knowledge is used for conducting ethnomodelling research that applies both local and global knowledges through respect, appreciation, dialogue, and interaction. Because mathematics is a culturally-bound social construct, the authors define ethnomodelling as the study of mathematical phenomena within a culture. Ethnomodelling brings the cultural aspects of mathematics into the modelling process, and uses it as a tool to give a voice and opportunity to explain and share mathematical knowledge (Rosa &Orey, 2019a).

The main objective of ethnomodelling is to share the combination of local, global, and glocal approaches where ethnomodelling research takes ethnomathematics beyond the study of the exotic or curious to look at how diverse ideas and procedures contribute to the acquisition of a holistic understanding of mathematical practices. Numerous ethnomodelling investigations have revealed sophisticated mathematical practices that include geometric principles in craft work, architectural concepts, and practices in the activities of many native and indigenous peoples, local, and vernacular cultures (Rosa & Orey, 2020).

These mathematical practices are related to diverse numeric relations found in measuring, calculation, games, divination, navigation, astronomy, and modelling, as well in a wide variety of mathematical procedures and techniques found in cultural artefacts. Investigations were developed using an anthropology-based paradigm that considers both intuitive mathematical thinking and the cognitive processes linked to it developed by members in distinct cultural groups. Therefore, when working with ethnomodelling, it is possible to identify at least three approaches that have come to help us investigate, study, and further understand mathematical ideas, procedures, and practices developed by the members of any given cultural group (Rosa & Orey, 2019b):

1) Global (*etic-outsider*) is the outsiders' view on beliefs, customs, and scientific and mathematical knowledge of the members of distinct cultural groups. Globalization has reinforced the utilitarian approach to school mathematics and the Western bias in the prevailing mathematics curricula, as well as helped to globalize pervasive mathematical ideologies. In particular, school mathematics is criticized as a culturally homogenizing force, a critical filter for status, a perpetuator of mistaken illusions of certainty, and an instrument of power. The mathematics curriculum is central to cultivating values as well as fostering the *conscientization* of learners. In this approach, comparativist researchers attempt to describe differences among cultures. These individuals are *culturally universal*.
2) Local (*emic-insider*) is the insiders' view of their own culture, customs, beliefs, and scientific and mathematical knowledge. Local knowledge is important because it has been tested and validated within the local context. Local knowledge creates a framework from which members of distinct cultural groups are able to understand and interpret the world around them. Currently, there is a recognition of the importance of local contributions to the development of scientific and mathematical knowledge. In this approach, members of distinct cultural groups describe their culture in its own terms. These individuals are *culturally specific*.
3) Glocalization (*emic-etic*) represents a continuous interaction between globalization and localization, which offers a perspective that both approaches are elements of the same phenomenon. It involves blending, mixing, and adapting two processes in which one component must address the local culture, system of values and practices. In a glocalized society, members of distinct cultural groups must be "empowered to act globally in its local environment. In this context, it is "necessary to work with different cultural environments and, acting as ethnographers, to describe mathematical ideas and practices of other peoples as well it is fundamental to give meaning to these findings.

Through first focusing on local knowledge and then integrating global influences we can create individual and collective group views that are rooted first in their own local cultural experiences and contexts, but are also equipped with a global knowledge that creates a sort of localized globalization. It is hoped that this enables researchers to move beyond what is in danger of being relegated to the *curious* or *exotic* and focusing more on creating a deeper understanding towards how people actually use mathematical thinking to resolve problems within their own local communities.

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Ethnomathematics in an Era of Pandemics

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For many years, the view of mathematics as a *universal* field of knowledge has been dominant. However, studies on ethnomathematics have been emerging for several decades. Such a repertoire of research supports the claim that culture can be implemented in the mathematics classroom in various ways and with a wide range of varying resources. The literature proposes two ways to integrate ethnomathematics in the process of teaching and learning in the math classroom: first, through the use of inventive ideas inspired from one's own culture; second, by the exploration of new ideas in other cultures. There is also a significant emphasis on the role that ethnomathematics' materials play in the enculturation and acculturation processes within and across diverse cultures (Chahine, 2011).

Research on the ethnomathematics of different cultures has provided a wealth of creative and thought-provoking materials such as number systems, folk games and puzzles, kinship relations, divination systems, symmetric strip decorations and many others that can be actively used by students in the classroom to enhance their learning of mathematics. Ascher (2002) argues that what makes culturally derived mathematical ideas so powerful is that they are entrenched in contexts in which they arise as part of the complex of ideas around them. Such contexts include *divination*, *calendrics*, *religion*, *social relations*, *decoration* and many others.

A handful of research has shown the importance of integrating cultural practices that resonate with students' ethnic and background experiences in everyday instruction. Particularly in STEM disciplines (Science, Technology, Engineering, Mathematics) and in light of the diverse demographics that thrive in schools today, there is an unprecedented focus on valorizing the use of community-based, culturally oriented learning experiences. Researchers that have emphasized the role of cultural practices in analyzing the relation between culture and cognition have been inspired by ethnographic literature. In his book, *Mathematics as a Cultural System*, Wilder (1981) asserts that each culture has its own mathematics which evolves and perish with that culture. Such studies, and many others, reinforced the belief that the category "mathematics" is rather specific and that perhaps we should not expect to find anything so labeled by other peoples in other cultures. Mathematical ideas will have to exist implicit in other areas and activities.

In a similar vein, Nisbett (2003) expands the view that people coming from different ecologies and social structures hold different cognitive and affective systems. In striking a comparison between Easterners and Westerners, the author explains: "The collective or interdependent nature of Asian society is consistent with Asians' broad, contextual view of the world and their belief that events are highly complex and determined by many factors. The individualistic or independent nature of Western society seem consistent with the Western focus on particular objects in isolation from their context and with their Westerners' belief that they can know the rules governing objects and therefore can control the objects' behaviour" (p.17).

With such diversity in modes of thinking and in abilities, all previous views seem to support the claim that there is no universal way to teach mathematics for all children. More interestingly, perhaps, is the belief that even mathematics has no generally agreed upon definition. The only truth

is that "the category 'mathematics' is Western and so is not to be found in traditional cultures" (Ascher, 1991, p.3). Implications of this argument for our multicultural classrooms are tremendous. If we value ethnic diversity as enriching, then the key of ensuring equity in accessing high-status mathematical knowledge is providing the proper setting and the appropriate materials that capitalize on and support students' abilities.

In wake of COVID-19 pandemic early in 2020, which inundated healthcare systems worldwide and shut down vital political, socio-economical and educational institutions globally, drastic precautionary measures have been put in place to mitigate the expansive spread of the virus and to halt its spread over time. With the surge of the outbreak exponentially growing, the world fell into a multi-dimensional crisis that is technological, economic, social, cultural, political and geopolitical.

In reimagining what it looks like to prepare educators in a pandemic/post-pandemic world, education systems worldwide stumbled to meet designated expectations as much as possible to move through the upcoming school year by affording institutions the space necessary to respond to this situation based on local context. In the US, the situation was much more severe, particularly as communities of color faced two pandemics: COVID-19 and racism. It became critical that mathematics educators continue to work and evolve student experiences to intentionally and strategically disrupt and dismantle racism given the significant trauma caused by systemic oppression and COVID-19.

Ethnomathematics as a field of social practices that calls for equitable distribution of access to mathematical knowledge(s), interrogates the racial histories and racialized social systems of every society that privilege the supremacy of identities of competence. Adopting an ethnomathematical methodology could help shed some light on questions related to which mathematical knowledge and competencies are valued, which groups are deemed doers of mathematics and worthy of access to mathematical and social opportunities, and what purposes and power structures mathematics education is expected to serve within and across global contexts.

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BOOK REVIEW

We would like to gratefully acknowledge Maria del Carmen Bonilla, from the Universidad César Vallejo, in Lima, Peru, for her kind reviews of the two books below.

Matemáticas de orden social: Tensión entre las etnomatemáticas y cambios socioeconómicos del país

Armando Aroca Araújo

Reseña de libro

Este libro tiene el foco en las tensiones que se producen entre el desarrollo socioeconómico del país y las etnomatemáticas empleadas en algunas actividades informales de supervivencia de las personas y cuyo producto está sujeto a procesos de transacción económica, es decir, el producto de la actividad se comercializa. A medida que se va describiendo la práctica artesanal u oficio y la matemática que han desarrollado histórica y culturalmente se van presentando las tensiones de dicha práctica con fenómenos de desarrollo socioeconómicos del país, sea de nivel nacional o regional. Este libro es un ejemplo de cómo las matemáticas son un producto cultural. Las matemáticas son inherentes al pensamiento del ser humano y no solo reposan en textos escolares, tienen vida en las realidades. Las matemáticas son desarrolladas en diversos contextos, como por ejemplo en las prácticas artesanales u oficios indistintamente del grado de escolaridad de las personas y ellas están ligadas íntimamente a procesos de permanencia y transcendencia de las personas o comunidades que a su vez están tensionadas por el mismo desarrollo socioeconómico del país.

The Mathematics of social order: Tension between ethnomathematics and socioeconomic changes in the country

Armando Aroca Araújo

Book review

This book focuses on tensions that occur between the socio-economic development of the country and the ethnomathematics used in some informal survival activities of people and whose product is subject to economic and commercial transaction processes. The artisan or commercial practices and the mathematics that have been developed both historically and culturally are described, tensions are created with the phenomena of socioeconomic development of the country, either at the national or regional level. This book is an example of how mathematics is a cultural product. Mathematics is inherent to the human thinking and not only resting in school texts. The mathematics as described here has life in reality. Mathematics developed in various contexts, such as in craft practices or trades regardless of the people' degree of schooling, are closely linked to processes of permanence and transcendence of people and communities that are in turn stressed by the socio-economic development of the country.

Etnografía del saber matemático de los pescadores de Buenaventura. Pacífico colombiano. Elementos para una educación matemática contextualizada

Armando Aroca Araújo

Reseña de libro

Este libro tuvo como objetivo construir una aproximación a los saberes, prácticas y lenguajes matemáticos de un grupo de pescadores artesanales en torno a las representaciones témporo-espaciales que ellos emplean al momento de ir de faena de pesca. Los pescadores entrevistados u observados residen en Buenaventura y dos de sus corregimientos, Punta Soldado y la Bocana, en el

pacífico colombiano. Se analizaron algunas de sus actividades asociadas a la pesca, y se hizo énfasis en sus representaciones de espacio, formas de orientación, espacialidad y temporalidad, como también al análisis de otras prácticas que involucren pensamiento métrico y numérico y la descripción de los elementos del mismo contexto sociocultural asociados a la pesca. Lograr el objetivo anterior, implica que se construya una base informativa que podría ayudar a la construcción de una propuesta de educación matemática contextualizada. Nuestro enfoque del Programa Etnomatemática implica una enseñanza paralela y comparativa entre los saberes matemáticos escolares como representantes de la cultura globalizante y los saberes matemáticos de los sujetos como representantes de la cultura local. En este libro mostramos una alternativa de cómo se podría profundizar en el conocimiento de un saber local matemático que quisiéramos ver reflejado en el aula de clases de matemáticas. El libro queda en deuda con la ejecución de la propuesta educativa que se postula casi al final del mismo libro, pero este es un primer paso que ayudará al desarrollo de otras investigaciones futuras.

Ethnography of the mathematical knowledge of the fishermen of Buenaventura. Colombian Pacific. Elements for a contextualized mathematics education
Armando Aroca Araújo

Book review
The aim of this book was to build an approximation to mathematical knowledge, practices and languages of a group of artisanal fishermen around the temporal-spatial representations that they use when fishing. The fishermen interviewed and observed live in Buenaventura and two of its townships, Punta Soldado and La Bocana, in the Colombian Pacific. Some of their activities associated with fishing were analyzed, and special emphasis was placed on their representations of space, forms of orientation, spatiality and temporality, as well as the analysis of other practices that involve metric and numerical thinking and the description of the elements of the sociocultural contexts associated with fishing. To achieving the objective an information base builds a contextualized mathematics education proposal. Our approach to the Ethnomathematics Program implies both parallel and comparative teaching between school mathematical knowledge as representatives of the globalizing culture and the mathematical knowledge of the subjects as representatives of local culture. In this book the authors demonstrate an alternative to how we could deepen the local mathematical knowledge that we would like to see reflected in the mathematics classroom. The book is indebted to the execution of an educational proposal that is postulated near the end of this book, and represents a first step that will help in the development of future research.

MEET THE NEW MEMBERS OF ISGEM EXECUTIVE BOARD

Milton Rosa
President

Milton Rosa was born in Amparo, in the state of São Paulo, Brazil. He graduated in Mathematics and Sciences from *Faculdade de Ciências e Letras Plínio Augusto do Amaral* in 1983, earned a Masters degree in 2001 and Doctorate degree in 2010 both in Education from *California State*

University in Sacramento. He also earned a post-doctorate degree in Education from Universidade de São Paulo. His studies focus on ethnomodelling research, which is the connection between ethnomathematics and mathematical modelling. He worked as a mathematics teacher at Encina Preparatory High School in Sacramento, California, from September 1999 to January 2011. Since February 2011, Dr. Rosa has been a professor at the Universidade Federal de Ouro Preto, Ouro Preto, Minas Gerais, Brazil. Currently he is a professor at the Departamento do Mathematics Education and he has experience in Mathematics Education acting on the research areas such as ethnomathematics, mathematical modelling, ethnomodelling, curriculum and instruction, educational leadership, distance learning, and history of mathematics. He is also a co-editor of the Journal of Mathematics and Culture and Journal of Numerical Cognition. Dr. Rosa has published over 200 papers and articles, chapter books, and books in Portuguese, Spanish, and English in national and international journals. He joined over 150 conferences and symposia in international and national level with contributions of plenaries, round tables, communications, and posters. He is currently serving as the President of the International Study Group on Ethnomathematics (ISGEM). He also has supervised numerous masters' thesis in the area of Mathematics Education. In 2010, Dr. Rosa was awarded the Dr. Carlos J. Vallejo Memorial Award, in the area of Multicultural and Multiethnic Education (MME), in the Special Interest Group (SIG) in the American Education Research Association (AERA) as an emerging researcher in the area of Mathematics Education related to diversity and multicultural education.

Tod Shockey
Vice President 1

Tod Shockey is a mathematics educator in the United States. He earned his PhD at the University of Virginia in 1999, writing his dissertation on the ethnomathematics of a group of thoracic cardiovascular surgeons. Shockey's primary interest in ethnomathematics is understanding how mathematics education opportunities may be improved for all students. Shockey currently serves as the editor in chief for the Journal of Mathematics and Culture, sponsored by the North American Study Group on Ethnomathematics. The Journal is open access with an editorial board that considers submissions in Arabic, English, Italian, Portuguese, and Spanish.

Wilfredo Vidal Alangui
Vice President 2

He is known to friends and colleagues as Willy, is a professor of mathematics at the University of the Philippines Baguio handling courses in the graduate and undergraduate mathematics programs. His academic training in mathematics and mathematics education was from the University of the Philippines and the University of Auckland respectively. His research interest is on the interplay of mathematics/mathematics education, and culture, Indigenous Peoples' education and Indigenous Knowledge Systems. Willy was a recipient of the 2019 Australian Executive Leadership Award that allowed him to stay at the University of Tasmania in Launceston, Tasmania to learn from Australian colleagues on their work in indigenous education. Since 2012, he has been involved in Indigenous Peoples' Education efforts, helping several indigenous elementary and secondary teachers in the

Philippines develop culturally relevant lessons in mathematics and other subjects. He was involved in the development of an Indigenous Curriculum Framework in support of the Indigenous Peoples' Education program of the Department of Education in the Philippines, and currently, in Teaching Science and Mathematics for Indigenous Students, which is a joint project of the Department of Science and Technology and the Indigenous Peoples Education Office. Some of his individual and collaborative works have come out in mathematics education journals and proceedings, and as chapters in books published by Springer (2016; 2017), Routledge (2017), Cambridge (2018). He has authored/co-authored books on functional literacy, mathematics and culture, and indigenous learning systems that were published by the University of the Philippines Center for Integrative and Development Studies and the Department of Education and Culture; co-edited two Springer books on ethnomathematics; and co-edited books on natural resource management published by Tebtebba Foundation, an international NGO based in the Philippines that works with indigenous communities worldwide. His most recent publication came out in the journal Current Opinion in Environmental Sustainability, based on his work with colleagues in the Task Force on Indigenous and Local Knowledge of the Intergovernmental Science-Policy Platform on Biodiversity and Economic Services. He is currently serving as a vice president of the International Study Group on Ethnomathematics (ISGEM) and as Asia coordinator for the International Network on Ethnomathematics (RedINET). As a mathematician and mathematics educator, his teaching, research, public, and extension work are largely informed and dictated by an interdisciplinary and critical perspective arising from his academic training and his being an indigenous person and activist.

Marcos Cherinda
Vice President 3

He is Mozambican, professionally trained as Teacher of Mathematics and Physics (1980-1981) for secondary education, at the Faculty of Education of the Eduardo Mondlane University in Maputo. After two years teaching those subjects in Nampula Province, he went to study in Germany, where in 1989 completed the *Diplom Lehrer* in Mathematics. In 2002, he obtained a Ph.D. in Mathematics Education from the University of the Witwatersrand, Johannesburg, South Africa. Very passionate about ethnogeometry, his doctoral thesis theme was *"The use of a cultural activity in the teaching and learning of mathematics: Exploring twill weaving with a weaving board in Mozambican classrooms".* In 2012, he was appointed to the position of National Representative of Mozambique for the *International Commission on Mathematical Instruction* (ICMI), a commission of the *International Mathematical Union*. In 2014, he joined his colleagues from Brazil and Portugal to found the *Espaço Matemático em Língua Portuguesa* – EMeLP (Mathematical Space in Portuguese Language). With special advice of the late President of ISGEm, Professor Paulus Guerdes (1952-2014), Marcos Cherinda was the Chair the Local Organizing Committee of *5th International Conference in Ethnomathematics*, held in Mozambique, Maputo, from 7 to 11 July 2014. Until 2017, he worked as a Professor of Mathematics Education at the *Pedagogical University in Mozambique*, where he served as Director of the Faculty of Natural Sciences and Mathematics for eight years. Currently he is a senior officer of the *United Nations Educational, Scientific and Cultural Organization* (UNESCO) at the Maputo office.

Iman C. Chahine
Treasurer

The elected Treasurer of International Study Group on Ethnomathematics (ISGEm) is an Associate Professor of Mathematics Education at the College of Education at University of Massachusetts Lowell and an appointed Extraordinary Professor at North West University in Potchefstroom, South Africa. She is also a co-editor of the Journal of Mathematics and Culture and a 2019-2020 Fulbright Scholar in South Africa. Dr. Chahine has published in peer-reviewed premier journals and newsletters including Educational Studies in Mathematics (1999, 2002); Journal of Humanistic Mathematics (2013, 2018), Journal of Mathematics Teaching in Middle Schools(2017), International Journal for Studies in Mathematics Education (2011); Teaching Children Mathematics(2007); Journal of Urban Mathematics Education (2010); Near and Middle Eastern Journal of Research in Education(2014); Journal of Mathematics Education (2015); The Journal of Mathematical Behavior (2013), Latin American Journal of Ethnomathematics (2013), Indilinga: African Journal of Indigenous Knowledge Systems (2013) and ISGEm (2011). Her research and teaching interests include modeling indigenous knowledge systems; ethnomathematics; embodied and situated cognition; neurocognitive and multimodal learning; and problem solving in unconventional settings.

Maria del Carmen Bonilla
Secretary

Masters in Teaching of Mathematics. Degree in Mathematics Education. Researcher in Ethnomathematics, History and Philosophy of Mathematics of Peruvian native peoples, in the use of technology in the teaching of mathematics, especially in relation to Dynamic Geometry, Cabri and Geogebra software. Principal investigator of the *Research Project in Ethnomathematics* that won the first place of the *Interuniversity and Multidisciplinary Research Award 2015* of the *Consortium of Universities of Peru.* In 2017, she developed her research in a sabatical at the Andre Revuz Laboratory in France. She is the founding member and president of *Peruvian Association for Research in Mathematical Education* - APINEMA (2012-2019), affiliated to the Ibero-American Federation of Mathematical Education Societies - FISEM. She is a member of the *Latin American Committee for Educational Mathematics* (CLAME). Founding member of the *Mathematics Education Community of South America* (CEMAS) and responsible for virtual events. She was the coordinator of the *Latin American Network of Ethnomathematics* (2015-2018). She is a professor at the *César Vallejo University*, Graduate School, and has worked at the *National University of San Marcos*, the *Cayetano Heredia Peruvian University*, and the *Pontifical Catholic University of Peru*.

Kay Owens
Special Vice President
7th International Conference of Ethnomathematics

Kay Owens represents the Australasian members of ISGEM and has been a long-term member of the Mathematics Education Research Group of Australasia and a former Vice-President as well as

being an active member of the Mathematics Association of NSW, affiliated with the Australian Association of Mathematics Teachers. Kay worked at the Papua New Guinea University of Technology and Balob Teachers College for 15 years in PNG and continues to research with her PNG colleagues. She is currently Senior Lecturer at Charles Sturt University in Australia. Her books Visuospatial Reasoning: An ecocultural perspective on ethnomathematics encourages an ethnomathematical perspective on visuospatial reasoning. Other chapter authors include Marcos Cherinda from Mozambique and Ravi Jawahir from Mauritius. Her book on History of Number: Evidence from Papua New Guinea and Oceania has co-author Glendon Lean with Patricia Paraide and Charly Muke and provides an extensive analysis of the counting systems of PNG (there are 850 languages) and establishes counting systems for languages that have continued since 10 000 years before the present, possibly up to 40 000 years ago based on linguistic archaeology and current practices. She is currently writing with these two PNG researchers and others on the Mathematics Education in a Neo-Colonial Country: The Case of Papua New Guinea.

LAST REMARKS

In this pandemic period, it is necessary to share and debate issues regarding mathematics education, classroom practices, and the knowledge developed by the members of specific cultural groups in order to value, respect, and explore their mathematical knowledge through the use of connections of ethnomathematics in a search for peace and social justice. In the context of the international dialogue, we hope that we were able to broaden the discussion for possibilities of the inclusion of diverse and local and global contexts and perspectives on ethnomathematics in relation to the sociocultural diversity of all peoples in their search for survival, transcendence, and peace. This approach supports the development of understanding, sharing and respect of our unique differences through dialogue in order to avoid domination and oppression.

Newsletter

ISGEm Executive Board

Newsletter