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Editorial

The role of ethnomathematics in mathematics education

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Many ethnomathematicians consider the launch of ethnomathematics to be plenary address of Ubiratan D'Ambrosio at the fifth International Congress of Mathematical Education in Australia in 1984. Since then, for nearly thirty years, the International Congresses of Mathematical Education have included groups devoted to ethnomathematics. We were pleased to continue that tradition at ICME-12 in Seoul, South Korea, in Topic Study Group 36. Some of the papers from the TSG-36 presentations are included in this journal.

Ethnomathematics work ranges from field reports of mathematical uses by various cultural groups, to applications in classrooms, cross-cultural projects, and theoretical discussions of the foundations and directions of ethnomathematics.

All of these areas were represented in the presentations of the TSG-36. We saw field reports from areas that had not previously been seen in ICME meetings on ethnomathematics, notably from Nepal, Tibet, and China, as well as Zambia. Several presenters covered classroom issues such as questions of the competition between the value using of local cultural mathematics vs. concerns to prepare for standard exams based on "world" mathematics in northern Canada, and the value of funding to support new inclusions of cultural material in mathematics curricula in Australia.

Most agreeable was the coincidental gathering of several theoreticians, who had often cited each other, all discussing the values and future directions of ethnomathematics. Their presentations interacted for a valuable and educational discussion.

The alternating gatherings of ethnomathematicians at quadrennial ICME meetings and ICEM conferences effectively bring them together every two years. Such face-to-face meetings have the special values of allowing exchange of ideas and building a fellowship of ethnomathematicians supporting each other to keep the field lively and active.

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We are pleased to offer this collection of some of the presentations at ICME-12. Keep in mind that these papers are not the ones presented and discussed there, they incorporate already the discussion that happened and the subsequent reflection.

Iman Chahine and Nirmala Naresh report the relationships between learning of mathematics and the context and situation of the learning and application experience, especially in the out-of-school use of mathematics. In particular, they consider workplace use of mathematics by child street vendors in Lebanon and adult bus conductors in India, noting that in both situations accurate and efficient mathematical thinking is important. They compare the situations of the mathematics used, the representations of the mathematics, and the problem solving "heuristics-in-action" techniques. Specific examples are shown as well as careful comparisons with earlier work in similar areas.

From Joana Latas and Darlinda Moreira we have a paper attempting to integrate cultural aspects in the school curriculum. They briefly describe research they carried out where a curricular project conceptualized under an ethnomathematical approach was tried with students in Portugal. In the paper however they focus on the role of cultural mathematics in the general aspects of mathematical connections and mathematical communication. And they do it by constructing examples based on boomerangs and the questions: what are they, how they work, which are the best?

Kay Owens presents a very positive report of efforts at four quite different schools in New South Wales, Australia, to make the schools more academically successful while reaching out to incorporate indigenous culture into the curriculum and school management. Due to historical and modern injustices, many aspects of the indigenous culture and language had been lost. Also, student participation and performance at school was very low. Through increased personal interaction of teachers and school leaders with the families and the community, plus the use of several new curricular programs, much progress has been made in bridging the school and the community.

Andrea Roher and Gert Schuring ask foundational questions in a look at the meaning of ethnomathematics as a field, continuing discussions that go back to the beginnings of ethnomathematics in the 1980s and recently revived. Others have pointed to inconsistencies and disagreements about the work of ethnomathematics, to the issues of relating ethnomathematics to mathematics and to education, and to a strong aspect of practice in ethnomathematics, especially efforts to bring local mathematical culture into formal school curricula. They suggest that ethnomathematics should be defined as an interdisciplinary field, challenging mathematics to be continually aware of its cultural contexts.

Alexandre Mopondi-Bendeko and Fiancée-Gernavey Bantaba present us a paper based on the idea to articulate together ethnomathematics with the theory didactic situations of Guy Brousseau. For that they rely on the concept of didactic transposition to transform mathematical situations (the examples are from African societies living south of the Sahara) into a didactic situation in mathematics. Their focus then falls on the game of Ngola, played in central Africa. They present the game, and use it to bring forward a situation in which producing the game board leads to mathematical activity with a specific content in mind.

Zhou Chang-jun, Shen Yu-hong, and Yang Qi-xiang report observed data on the mathematics of the Dai people of southwestern China and neighboring areas. They include information on counting words, measurement units, the Buddhist-based calendar, and some use of non-decimal base systems. Examples of geometry (with photos) are shown in clothing design, architecture, and objects of daily life. They conclude with recommendations for use in school mathematics classes.

Milton Rosa and Daniel Orey bring us a paper attempting to link ethnomathematics with modeling. To do this they travel to ancient Babylon and describe the civilization, however briefly, and especially their mathematical practices. Then they take one particular mathematical problem of Babylon origin and translate it from rhetorical language to mathematical language, comparing strategies, techniques and procedures. They claim that mathematical modeling may be used in translating and comparing distinct cultural groups systems.

Alexandre Pais and Mônica Mesquita bring a paper describing and discussing a Portuguese project - Urban Boundaries Project. This project, based on six sequential steps (management, community mediation, theorizations development, interactive data collection, critical data analysis and dissemination) is being developed in suburban coastal Lisbon. Working from the communities local knowledge they see ethnomathematics as a way to deal with different ways ok knowing and as a political space for emancipation.

Mônica Mesquita brings us a paper on the study of urban cultural groups from São Paulo, Brazil. She builds on the concept of freedom, in particular freedom of choice. Freedom of choice, she argues, is conditioned to a certain number of society permitted choices, which are determined by a dominant ideology. Ethnomathematics allowed her to establish bridges between different cultural groups, the Children in street situation and the academic in a dialogical process. The discussion considers among others the concepts of social construction of knowledge, freedom of knowledge and children's rights.