

Preface

Ethnomathematics as an important line of study and research in mathematics education investigates the roots of mathematical ideas, procedures, and practices, starting from the way individuals behave in different cultural groups. Over the past three decades, the amount of research, investigations, thesis, and dissertations that dealt with both the theoretical and practical aspects of ethnomathematics has expanded exponentially and worldwide.

In this regard, ethnomathematics has come to study our diverse cultural roots of mathematical knowledge starting from the various ways in which the members of distinct cultural groups mathematize. The study of ethnomathematics also considers the historical evolution of the mathematical knowledge with the acknowledgment of all social and cultural factors that mold this development.

Numerous articles, projects, chapters, and books have been written in many countries about the relation between culture, mathematics, and mathematics education. Over the same time, the early founders of ethnomathematics have found countless new voices that have gone on to make even more new discoveries, and offered even more new insights. As researchers matured, new studies involving ethnomathematics were discussed and debated in a succession of local, regional, national, and international meetings, seminars, conferences, and congresses as well as in numerous study groups around the world.

When the focus of a study is the pedagogy of mathematics, our attention must be centered both around legitimizing the students' knowledge, grown from experiences built in their own ways, and around the study of the pedagogical possibilities of how to work with the diversity of learning processes that occurs outside and inside of our school environments. Indeed, a discussion of the educational aspects of ethnomathematics helps teachers to establish cultural models of beliefs, thought, and behavior, in the sense of contemplating the potential of the pedagogical work that takes into account the previous knowledge of the students as well as a mathematical learning that is more meaningful and empowering.

In this book, we highlight the evolution of the field of ethnomathematics across the globe by acknowledging that Prof. D'Ambrosio is the most important theoretician in this field and offers encouragement, leadership, and dissemination of our

many new ideas, concepts, and perspectives involved in ethnomathematics around the world and its applications to mathematics education. From his point of view, the program *ethnomathematics* is a way of generating, organizing, and diffusing knowledge developed by culturally identified groups that offer a possibility of meeting the challenges of proposing and keeping peace.

In order to elucidate and clarify, and perhaps to facilitate new discussions about ethnomathematics, we truly hope that readers will be able to capture the many authors' thoughts and concepts regarding ethnomathematics. From the authors' own particular vantage points, they each have done a great deal to add to a growing body of scientific discourse of this program as presented in the ICME13–TSG35 Ethnomathematics Study Group in Hamburg, Germany, in 2016. As well, we would like to state at the outset that there are other perspectives and diverse approaches for mathematics education as well as innovative views on ethnomathematics emerging from other researchers and in other knowledge fields. We hope that future books will consider them as well. We would also like to emphasize that the questions, answers, comments, conceptions, and discussions made in the chapters in this book are the authors' personal views on ethnomathematics and not necessarily those of the editors.

We are certain that not all educators, mathematicians, and philosophers will agree upon these views and conceptions on ethnomathematics. As well, we are confident that, in some cases, the approaches, perspectives, and innovations presented here may be in discordance with views of other ethnomathematicians. Thus, we are pleased that this book will illustrate what happens within a research field as it continues to evolve and has spread itself worldwide to include a diversity of schools, colleges, universities, and local communities, in a relatively short period of time.

We have no doubt that ethnomathematics is alive, and it is evolving as more and more research is uncovered worldwide. We also understand that it will continue this growth process. It is a research field that has not yet crystallized and that to us is very, very exciting! As it stands currently, it seeks to document and understand widely diverse mathematical ideas, procedures, and practices as distinct cultural group members gain voice and present their perspectives in order to become empowered and value their previous knowledge. As this diversity of voices begins to speak, they have remarkably similar, yet different points of view.

From the discussions provided by the authors who presented at ICME13–TSG35 Ethnomathematics Study Group in Hamburg and who wrote chapters for this book, we can safely conclude that mathematical knowledge, as we currently experience it, is constructed by the development of different ideas, procedures, and practices that are common to the members of all our diverse sociocultural groups. These processes enable us to elaborate and use our abilities and competencies, which include the universal mechanisms of *counting, locating, measuring, drawing, representing, playing, understanding, comprehending, explaining, and modeling*. Today, ethnomathematics investigates the roots of mathematical ideas and practices, starting from the way diverse individuals behave in different cultural groups.

In other words, many of the ethnomathematical studies as presented in this book identify the mathematical practices that begin with the knowledge of the *others* in their own terms and rationality. To know and understand the value of the plurality

of the nature of our diverse social, cultural, economic, and political realities is a necessity in order to take a firm stand against prejudices based on cultural differences, social classes, beliefs, gender, sexual orientation, ethnics, or other social, cultural, political, and individual characteristics.

The authors in this book have shared and debated the necessity of issues regarding research, mathematics education, classroom practices, philosophies, and the knowledge of the members of specific cultural groups. Ethnomathematics clearly has a role in helping us to clarify the nature of mathematical knowledge and of knowledge in general. An important objective of this book is to show that in a globalized and interdependent world, it is fundamental for researchers and educators to understand that the diversity of ideas and thoughts that they come into contact with, are greatly influenced by members of distinct cultural groups and their unique mathematics. This pedagogical approach is not often reflected in traditional mathematics classrooms, yet high equitable expectations along with personalized connections in mathematics instruction are essential for success for all our students.

It is important to keep in mind that ethnomathematics grew out of the history of mathematics, mathematics education, and issues of mathematics in anthropology, sociology, economic, environmental issues, and political science as well as that it recognizes that all cultural groups do activities that involve mathematical thinking, even if the mathematics and it may not look like traditional Eurocentric academic mathematics that students learn in schools and universities. In its insubordinative and creative way, ethnomathematics is considered as basic to the counting terms in various languages or the use of symmetries in craft products, or as complex and controversial as oppressed societies using mathematics to encourage open-minded thinking to challenge power relations, which is the main purpose of this book.

The chapters discussed and debated in this book demonstrate the universal concern regarding mathematics education, classroom knowledge, and knowledge of cultural groups. Because ethnomathematics has a role in helping us to clarify the nature of mathematical knowledge and of knowledge in general, the discussions surrounding these issues do not imply that ethnomathematics is only an instrument to improve mathematical education. It is necessary to shift the research from theoretical issues toward practical issues that help educators and students to access their full potential by searching innovative forms and diverse approaches for mathematics education. Again, ethnomathematics is a young field of research, it is alive, and it is dynamic and evolving as more and more voices are added to the discussion. It is a privilege to be part of this movement!

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