

PREFACE

Oral storytelling dates back to ancient times. The first written description of it, found in the Egyptian Westcar Papyrus, was recorded sometime between 2000 and 1300 BCE (Baker & Green, 1987).

Early oral storytellers were historians, entertainers, bringers of news, religious and moral teachers, and educators. In the broadest sense the early storyteller was the medium through which a society passed on its culture. The teacher, the priest, the artisan, and the parent, as well as the professional “resident” and “traveling” storyteller, all used oral stories to pass on their traditions (Baker & Green, 1987). Professional oral storytellers were found throughout the world: in America, Europe, Africa, and Asia. Some of the more well-known oral stories familiar to Western cultures that have since been recorded include *Gilgamesh* (from the Middle East), the *Iliad* and the *Odyssey* (from Europe), and the *Ramayana* (from India). Bards of the British Isles often sang their stories or put them in poetry, as did those in Russia, Asia, North America, and Africa. Religious storytellers of India, China, and the Middle East often used physical manipulatives and pictures to aid them in their endeavors. Theatrical storytellers of China, Japan, Russia, and North America often performed their stories with the help of audience participation (Pellowski, 1990).

Once writing was invented, the educated had a new medium through which to pass on their culture. After printing became inexpensive in the fifteenth century, oral storytelling gradually began to wane in its influence as a medium for the transmission of culture.

When Friedrich Froebel founded the kindergarten movement in 1837, he introduced oral storytelling as a critical component for passing on culture to the young. By 1900 oral storytelling had found its place in American libraries in the form of the library hour, and in 1905 the first book was published in the United States on instructional uses of oral stories (Bryant, 1905). Gradually the power of oral stories was rediscovered by language arts teachers. It is now time for those of us concerned with the teaching of mathematics to begin to explore the instructional power of oral stories.

This book is largely about how mathematics and oral storytelling can be woven together to provide an exciting method of teaching mathematics. This instructional method grows out of the movement that advocates using children’s literature to enrich mathematics instruction. Mathematical oral storytelling takes a giant leap as it abandons the written word and picture book for the oral word. In so doing, it alters many of the fundamental assumptions of our

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highly literate culture about the nature of school mathematics and the roles of teachers and students during mathematics instruction. Oral storytelling transforms the abstract, objective, deductive mathematics we all have experienced in school into a subject surrounded by imagination, myth, and subjective meanings and feelings. It allows teachers to personalize mathematics and connect it with their own creative powers and fantasy life. And it allows children to bring to bear their creative and imaginative powers in making mathematics meaningful to themselves.

Many different types of oral stories can be wrapped around mathematics, including science fiction, historical fiction, fairy tales, detective stories, adventure tales, and autobiographical accounts. Similarly, different types of mathematics can be embedded in oral stories, including arithmetic, geometry, measurement, statistics, and algebra. They can be used to teach algorithms, concepts, problem solving, connections, and communication. In addition, epic oral stories can be used to teach content areas other than mathematics.

This book is also about mathematics and culture. It explores the highly literate culture of school mathematics, the mathematical conceptual systems embedded in the more oral cultures of many urban and rural families and communities, and the reasons why children from more oral families often have difficulty learning the highly literate school mathematics. It also explores the instructional practices and theories of multicultural mathematics education and the contributions that oral storytelling can make to that field.

Another contribution of this book is to the area of mathematical problem solving. It examines mathematical problem solving from the perspective of multicultural mathematics. In so doing, it extends currently popular models of mathematical problem solving by adding dimensions that incorporate new stages, the cultural backgrounds of learners, and how interactions between learners can contribute to their problem-solving abilities.

ORGANIZATION OF THIS BOOK

This book is organized into two parts. To give concrete meaning to theoretical discussions, each part of the book begins with a case study of how a real teacher told an oral story, and then succeeding theoretical discussions constantly reference the stories.

The first part of this book begins with a description of how a fourth grade teacher told a story called “The Wizard’s Tale” to her students. This story is designed to help second, third, and fourth graders learn multidigit addition. It is a search and rescue story in which children develop understanding and skills while pretending to be a mute bulldozer, talking parrot, and writing gorilla. It takes 5 sessions to complete. The teacher is Doris Lawson, who teaches in an urban area not far from Boston.

The first part of this book describes the essential elements of oral storytelling and shows how they can be used as the foundation for a new instructional methodology for teaching mathematics. It examines the nature of epic oral storytelling, how the relationships between teacher, students, and content function during oral storytelling, and pedagogical assumptions and techniques of oral storytelling. The first part of the book concludes with a chapter in which Doris discusses her experiences telling “The Wizard’s Tale” to her classes between 1993 and 1997.

The second part of *Oral Storytelling and Teaching Mathematics* begins with a description of how a sixth grade teacher told “The Egypt Story.” This story follows two children who travel back in time 3,500 years. It is designed to help fifth, sixth, and seventh graders learn

problem solving and multicultural mathematics during an instructional unit that integrates the teaching of mathematics and social studies. It contains 11 sessions that explore topics in arithmetic, geometry, and the history of mathematics. Doris Lawson also tells this story (in 1997 she moved from teaching all subjects to fourth graders to teaching mathematics and social studies in Grades 6, 7, and 8).

The second part of the book examines a variety of topics: the culture of school mathematics; the relationships between children's home cultures and the culture of school mathematics; how oral storytelling can help children who frequently have difficulty learning mathematics because of the knowledge base they acquire from early family and community interactions; the assumptions underlying, and the practices utilized by, multicultural mathematics; the nature of mathematical problem solving during oral storytelling; and the ideological battles currently being fought over the purposes and methods of multicultural mathematics instruction. This part of the book also includes an interview with Doris about her experiences teaching "The Egypt Story."

The complete texts for both oral stories, with all student handouts, are included on a CD that accompanies the book.

It needs to be mentioned that mathematical epic oral storytelling is not being presented as the salvation of mathematics education. It is only one of many powerful media that educators can use as part of their teaching repertoire. Oral stories provide an exciting alternative to current instructional practices, an alternative that complements existing methods.

A PERSONAL NOTE

After creating a number of mathematical epic oral stories, teachers began to ask me where the stories came from. At first my answer was that I used to tell my children bedtime stories almost every night for about 6 years. Gradually over time, certain heroes and heroines became their favorites, and I told more stories about those characters. There was the wise old Gandalf who arrived in my memory from *The Lord of the Rings* (Tolkien, 1954/1981). There was Tinkerbell, whom I created by combining the *Peter Pan* fairy (Barrie, 1904/1982) and Ged from *A Wizard of Earthsea* (Le Guin, 1968/1975). Over time, stories that began as separate adventures started to evolve into epics. One epic I remember, which probably had twenty installments, was about how Tinkerbell learned to do magic.

Recently teachers pushed me further to explore where my stories came from. They asked me to think about my childhood and try to remember who told me stories and when I told my first story. I cannot remember anyone telling me stories; I do remember, however, that over a period of about 3 years, I used to tell my brother and a friend occasional bedtime stories about Donald Duck and Scrooge McDuck. I used to love to read and daydream about Donald's and Scrooge's adventures.

I also remember that as a child the stories I read and the movies I watched were very real to me. I could not watch monster movies because they frightened me so. Even now my children laugh at me because I cannot watch a movie thriller without jumping around. The same happens with the mathematics epic oral stories I tell. As I tell them—as they arise out of some mysterious place in my subconscious that integrates fantasy and mathematics—they become real to me, and I see myself accompanying my heroes and heroines on their adventures. It is in this context that I invite listeners of my stories and readers of this book to suspend their grip on reality and join me on my adventures.

