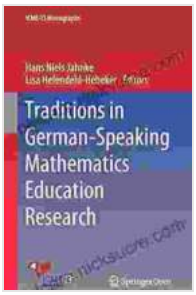
Traditions in German-Speaking Mathematics Education Research: ICME-13 Monographs



Traditions in German-Speaking Mathematics Education Research (ICME-13 Monographs)

★★★★★ 5 out of 5

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Mathematics education research in German-speaking countries has a long and rich history, dating back to the early 19th century. Over the years, a number of different theoretical and methodological approaches have been used to study mathematics education, and the field has undergone a number of significant changes. In this article, we will provide an overview of the traditions in German-speaking mathematics education research, as presented in the ICME-13 Monographs. We will discuss the historical development of the field, the different theoretical and methodological approaches that have been used, and the current state of the field.

Historical Development of Mathematics Education Research in Germany

The roots of mathematics education research in German-speaking countries can be traced back to the early 19th century, when a number of

scholars began to study the teaching and learning of mathematics. One of the most influential figures in this early period was Friedrich Fröbel, who developed the concept of the kindergarten. Fröbel believed that children should be actively involved in their own learning, and he developed a number of games and activities to help them learn mathematics. Another influential figure in this period was Johann Pestalozzi, who developed a method of teaching mathematics that emphasized the use of concrete materials. Pestalozzi's method was widely adopted in Germany, and it had a significant impact on the development of mathematics education research in the country.

In the late 19th and early 20th centuries, a number of new theoretical and methodological approaches were introduced into mathematics education research in German-speaking countries. These approaches included the use of psychology, sociology, and philosophy to study mathematics education. One of the most influential figures in this period was Felix Klein, who was the director of the University of Göttingen from 1886 to 1913. Klein was a strong advocate for the use of mathematics in the teaching of mathematics, and he developed a number of new curricula and textbooks that were based on this approach. Klein's work had a significant impact on the development of mathematics education research in Germany, and it helped to establish the field as a legitimate academic discipline.

In the mid-20th century, mathematics education research in German-speaking countries underwent a number of significant changes. One of the most important changes was the of the "new math" movement. The new math movement was a reform movement that sought to introduce new and more rigorous mathematics into the school curriculum. The new math movement had a significant impact on mathematics education research in

German-speaking countries, and it led to the development of a number of new curricula and textbooks. Another important change that occurred in the mid-20th century was the of computers into mathematics education research. Computers provided researchers with new tools to study the teaching and learning of mathematics, and they led to the development of a number of new research methods.

In the late 20th and early 21st centuries, mathematics education research in German-speaking countries has continued to develop and grow. There has been a growing emphasis on the use of mixed methods research, which combines qualitative and quantitative methods to study mathematics education. There has also been a growing interest in the use of technology to support mathematics learning. Today, mathematics education research in German-speaking countries is a vibrant and dynamic field, with a wide range of research topics being investigated. The field continues to be influenced by the traditions of the past, but it is also open to new ideas and approaches.

Theoretical and Methodological Approaches in German-Speaking Mathematics Education Research

A variety of theoretical and methodological approaches have been used in mathematics education research in German-speaking countries. These approaches can be broadly classified into two main categories: qualitative approaches and quantitative approaches. Qualitative approaches focus on the subjective experiences of individuals, while quantitative approaches focus on the objective measurement of variables. In recent years, there has been a growing emphasis on the use of mixed methods research, which combines qualitative and quantitative methods to study mathematics education.

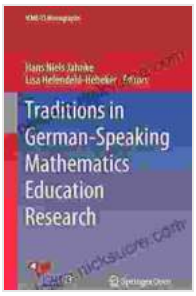
Some of the most common qualitative approaches used in mathematics education research in German-speaking countries include:

- **Ethnography**: Ethnography is a qualitative research method that involves observing and participating in a community or group over a period of time. Ethnographers typically use a variety of data collection methods, such as interviews, observations, and document analysis, to gain a deep understanding of the culture and practices of the group being studied.
- **Phenomenology**: Phenomenology is a qualitative research method that focuses on the subjective experiences of individuals. Phenomenologists typically use interviews to collect data about the experiences of individuals, and they then analyze the data to identify common themes and patterns.
- **Grounded theory**: Grounded theory is a qualitative research method that involves generating a theory from data. Grounded theorists typically collect data from interviews, observations, and document analysis, and they then analyze the data to identify patterns and relationships. They then use these patterns and relationships to develop a theory that explains the phenomenon being studied.

Some of the most common quantitative approaches used in mathematics education research in German-speaking countries include:

- **Surveys**: Surveys are a quantitative research method that involves collecting data from a large number of people using a questionnaire. Surveys can be used to collect data about a wide range of topics, such as students' attitudes towards mathematics, their beliefs about mathematics learning, and their achievement in mathematics.

- **Experiments**: Experiments are a quantitative research method that involves manipulating one or more variables to see how it affects another variable. Experiments can be used to test



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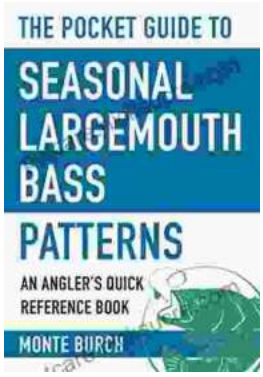

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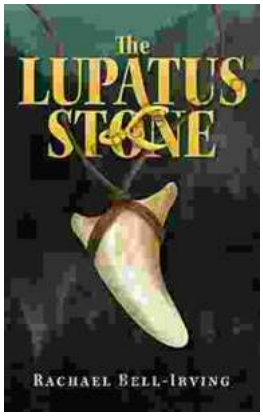

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