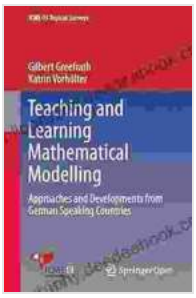
Approaches and Developments from German-Speaking Countries: ICME-13 Topical Surveys

The 13th International Congress on Mathematical Education (ICME-13) was held in Hamburg, Germany, from July 24 to July 31, 2016. The congress brought together over 3,500 participants from more than 100 countries to discuss the latest research and developments in mathematics education.

One of the highlights of ICME-13 was the series of topical surveys, which provided an overview of the state of the art in key areas of mathematics education. The following article summarizes the findings of the topical surveys that were presented by researchers from German-speaking countries.



Teaching and Learning Mathematical Modelling: Approaches and Developments from German Speaking Countries (ICME-13 Topical Surveys) by Kirby Tribe

4.3 out of 5

Language	: English
File size	: 1140 KB
Text-to-Speech	: Enabled
Screen Reader	: Supported
Enhanced typesetting	: Enabled
Word Wise	: Enabled
Print length	: 54 pages

Topic 1: The Role of Technology in Mathematics Education

Authors: Birgit Pepin, Freie Universität Berlin, Germany; Rudolf Straesser, Pädagogische Hochschule Karlsruhe, Germany

Abstract: The use of technology in mathematics education has been a topic of research for over 30 years. During this time, there have been significant advances in the development and use of educational technology, and the ways in which technology is used in mathematics classrooms have also evolved.

This topical survey provides an overview of the current state of research on the role of technology in mathematics education. It examines the different ways in which technology can be used to support teaching and learning, and it discusses the challenges and opportunities that arise from the use of technology in mathematics education.

Key Findings:

* Technology can be used to support a wide range of teaching and learning activities in mathematics education, including: * Exploring mathematical concepts and ideas * Developing problem-solving skills * Communicating mathematical ideas * Assessing student learning * The use of technology in mathematics education can lead to a number of benefits for students, including: * Improved understanding of mathematical concepts * Increased problem-solving skills * Greater confidence in mathematics * More positive attitudes towards mathematics * There are also a number of challenges associated with the use of technology in mathematics education, including: * The need for teachers to have adequate knowledge and skills to use technology effectively * The cost of purchasing and maintaining technology * The potential for technology to distract students from learning

Topic 2: Mathematics Teacher Education

Authors: Heinz Steinbring, Universität Bielefeld, Germany; Gabriele Kaiser, Universität Klagenfurt, Austria

Abstract: Mathematics teacher education is a critical field of research, as it has the potential to improve the quality of mathematics teaching and learning. This topical survey provides an overview of the current state of research on mathematics teacher education in German-speaking countries.

The survey examines the different approaches to mathematics teacher education, and it discusses the challenges and opportunities that arise from these approaches. The survey also provides a number of recommendations for improving the quality of mathematics teacher education.

Key Findings:

* There is a wide range of approaches to mathematics teacher education in German-speaking countries, including: * Traditional approaches that focus on content knowledge and pedagogical skills * More innovative approaches that focus on developing teachers' understanding of mathematics and their ability to teach mathematics in a meaningful way * There is a growing body of research on the effectiveness of different approaches to mathematics teacher education. This research suggests that more innovative approaches are more effective in improving the quality of mathematics teaching and learning. * There are a number of challenges that need to be addressed in order to improve the quality of mathematics teacher education. These challenges include: * The need for more research on the effectiveness of different approaches to mathematics teacher education *

The need for more resources to support mathematics teacher education * The need for more collaboration between researchers and practitioners

Topic 3: Mathematics Assessment

Authors: Susanne Prediger, Universität Bayreuth, Germany; Werner Blum, Universität Kassel, Germany

Abstract: Mathematics assessment is an important part of mathematics education, as it provides information about students' learning and can be used to improve teaching and learning. This topical survey provides an overview of the current state of research on mathematics assessment in German-speaking countries.

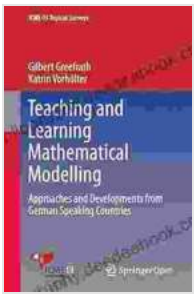
The survey examines the different approaches to mathematics assessment, and it discusses the challenges and opportunities that arise from these approaches. The survey also provides a number of recommendations for improving the quality of mathematics assessment.

Key Findings:

* There is a wide range of approaches to mathematics assessment in German-speaking countries, including: * Traditional approaches that focus on summative assessment * More innovative approaches that focus on formative assessment * There is a growing body of research on the effectiveness of different approaches to mathematics assessment. This research suggests that more innovative approaches are more effective in improving the quality of mathematics teaching and learning. * There are a number of challenges that need to be addressed in order to improve the quality of mathematics assessment. These challenges include: * The need

for more research on the effectiveness of different approaches to mathematics assessment * The need for more resources to support mathematics assessment * The need for more collaboration between researchers and practitioners

The topical surveys presented at ICME-13 provided a valuable overview of the state of the art in key areas of mathematics education. The findings of these surveys can be used to inform the development of future research and practice in mathematics education.



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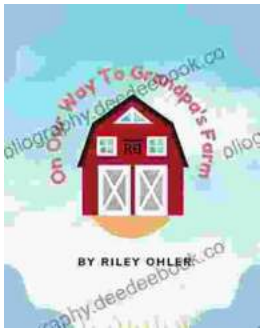

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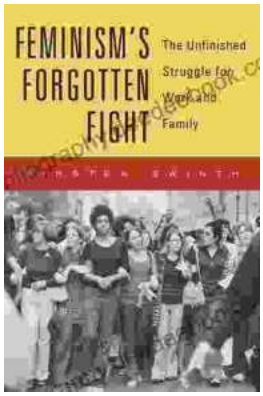

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