CHAPTER 1: INTRODUCTION

Education is widely recognized as a cornerstone of individual and societal progress. It is not merely an instrument for academic knowledge transmission but a lifelong process that shapes attitudes, values, behaviours, and intellectual capabilities. As John Dewey (1938) aptly stated, “Education is not preparation for life; education is life itself,” highlighting its continual and integral role in human development. In the global context, UNESCO (2015) defines education as “the process of facilitating learning or the acquisition of knowledge, skills, values, beliefs, and habits,” reaffirming its multifaceted nature and transformative power. Education empowers individuals to critically engage with the world, adapt to changes, and contribute constructively to society.

In India, education is not just a sectorial concern but a pivotal axis for nation-building. It is deeply shaped by national policies and socio-economic imperatives. The curriculum, as a core component of education, acts as a blueprint that determines what learners are taught and how learning is facilitated. In this context, the National Curriculum Framework (NCF) developed by the National Council of Educational Research and Training (NCERT) has historically played a significant role in shaping educational objectives and pedagogical approaches across Indian schools. Since the release of the NCF 2005, there has been a gradual but deliberate shift toward promoting learner-centric, inclusive, and constructivist education.

The National Curriculum Framework for School Education (NCFSE) 2023 marks a paradigm shift in curriculum design by integrating contemporary educational needs with Indian epistemologies and global competencies. This framework is rooted in the vision of the National Education Policy (NEP) 2020, which emphasizes holistic development, experiential learning, multilingualism, and interdisciplinary learning. One of the most innovative

Themes (CCTs). These themes are not confined to a specific subject area; rather, they traverse the curriculum to instil 21st-century skills such as environmental awareness, digital education, local and contextual knowledge inclusivity and values.

CCTs serve as pivotal tools for integrating equity, ethics, and empathy into subject matter content. They include thematic areas such as Rootedness in India and Indian Knowledge Systems, Learning about and Caring for the Environment, Inclusion in Schools, Values and Dispositions, Educational Technology, and Guidance and Counselling. These themes are designed to create learning environments that are not only academically rigorous but also socially responsive and culturally rooted.

Mathematics, by its very nature, fosters logical reasoning, quantitative analysis, and problem-solving abilities. When integrated thoughtfully with Cross-cutting Themes, it can help students contextualize mathematical concepts within real-world issues. For instance, embedding environmental themes in mathematical problems allows learners to engage with climate-related data analysis, while integrating inclusivity and equity through statistical tools enables a better understanding of social justice and distribution. Similarly, introducing themes related to values and ethics can offer students opportunities to reflect on fairness, honesty, and community well-being within mathematical tasks.

The revised Grade 6 Mathematics textbook is developed in alignment with NCFSE 2023. Traditionally, mathematics has been perceived as a subject primarily concerned with abstract concepts, procedural fluency, and numerical problem-solving. However, the revised curriculum envisions mathematics as a powerful medium to instil broader cognitive and affective capacities in learners.

Despite these progressive intents, the actual success of CCT integration depends on textbook design, pedagogical strategies, and classroom implementation. The concern remains whether these themes are genuinely embedded in the content or merely serve as superficial additions. For education to be transformative, CCTs must be meaningfully infused into the subject's instructional flow, enabling students to connect cognitive learning with lived experiences and societal contexts.

1.1 PRESENT STUDY

This research work undertakes a critical analysis of the Grade 6 NCERT Mathematics textbook to evaluate the integration of Cross-cutting Themes introduced under the NCFSE 2023. It aimed at exploring the depth, and authenticity with which these themes have been incorporated into the textbook content, examples, activities, and learning outcomes. The study also tried to find pedagogical opportunities and gaps, thereby offering recommendations for improving the implementation of CCTs in mathematics education.

1.2 RATIONALE OF THE STUDY

The integration of Cross-cutting Themes (CCTs) into curriculum frameworks, particularly in subjects like mathematics, has gained increasing attention in recent years. Despite the National Curriculum Framework for School Education (NCFSE) 2023 explicitly emphasizing the incorporation of these themes, there is limited empirical research on the effectiveness of this integration, especially in core subjects such as mathematics. This gap in scholarly exploration raises important questions regarding both the depth and quality of the CCTs embedded within educational resources, particularly in the NCERT sixth-grade mathematics textbook.

The NCFSE 2023 envisions the cross-cutting themes as pivotal instruments for fostering a holistic approach to education, wherein students are not only

equipped with academic knowledge but are also encouraged to engage critically with real-world issues, develop life skills, and practice social responsibility. The revised NCERT textbooks aim to reflect this broader educational philosophy by ensuring that content is aligned with these themes. The goal is to transcend the traditional subject boundaries and inculcate values such as environmental sustainability, digital literacy, inclusivity, and global citizenship, which are becoming increasingly essential in preparing students for a rapidly evolving, interconnected world.

The rationale for this study, therefore, lies in addressing the existing research gap by conducting a critical analysis of the NCERT sixth-grade mathematics textbook, with a specific focus on how well the Cross-cutting Themes have been integrated into its content.

1.3 STATEMENT OF THE PROBLEM

The present study is entitled as "A Critical Analysis of New NCERT Sixth Grade Mathematics Textbook in light of Cross-cutting Themes of NCFSE 2023."

1.4 OBJECTIVES OF THE STUDY

The primary aim of this study was to conduct a critical analysis of the new NCERT sixth grade mathematics textbook in light of the Cross-cutting Themes (CCTs) outlined in the National Curriculum Framework for School Education (NCFSE) 2023. The study intended to evaluate the depth, and effectiveness of integrating these themes within the textbook's content and pedagogical approach. The specific objectives of the study were as follows:

1. To identify the presence and frequency of CCTs in the textbook's content and activities.

2. To evaluate how well the textbook aligns with NCFSE 2023 guidelines for CCT integration.
3. To assess the pedagogical strategies used to embed CCTs in mathematical concepts.
4. To examine the inclusivity and relevance of CCT-related examples and exercises.

1.5 OPERATIONAL DEFINITIONS OF THE TERMS

- Critical Analysis:

A systematic and detailed examination of a text, material, or process to identify its strengths, weaknesses, patterns, and underlying themes. It involves both a qualitative and quantitative assessment to evaluate the effectiveness and alignment of the content with specified educational frameworks.

- Mathematics Textbook:

A resource specifically designed to teach students mathematical concepts, principles, problem-solving techniques, and applications in an instructional setting. In this study, the term Mathematics Textbook refers to the sixth-grade NCERT Mathematics Textbook revised under the NCFSE 2023 guidelines, with a particular focus on how Cross-Cutting Themes are represented in the textbook's content, exercises, and activities.

- National Curriculum Framework for School Education (NCFSE):

A national guideline formulated by the National Council of Educational Research and Training (NCERT), designed to shape the structure, goals, and pedagogical approach of the school curriculum in India. The NCFSE 2023 version emphasizes holistic education and interdisciplinary learning, incorporating Cross-Cutting Themes (CCTs) such as, Rootedness in India and Indian Knowledge Systems, Learning about and Caring for the Environment,

Inclusion in Schools, Values and Dispositions, Educational Technology, and Guidance and Counselling, aiming to promote the overall development of students.

- Cross-Cutting Themes (CCTs):

Foundational concepts and values that are integrated across various subjects and academic levels to foster comprehensive education. These themes address key areas of 21st-century skills and global citizenship, such as critical thinking, environmental sustainability, digital literacy, inclusion, values education, and global awareness. In this study, CCTs are evaluated within the sixth-grade NCERT Mathematics Textbook to assess how they align with the NCFSE 2023 framework and contribute to the overall development of the learner.

1.6 DELIMITATION OF STUDY

1. This study was limited to **NCERT sixth-grade mathematics textbook** as per the revised National Curriculum Framework for School Education (NCFSE) 2023.

2. Other mathematics textbooks, including those from different grades or publishers, were not within the scope of this study.

3. The analysis was focused on specific Cross-Cutting Themes (CCTs) emphasized in the NCFSE 2023 guidelines.