

CHINESE MATHEMATICS CURRICULUM REFORM FOR COMPULSORY EDUCATION IN THE 21ST CENTURY

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Curriculum reform is a fundamental factor in pushing forward educational development. This lecture will introduce the development and implementation of Chinese mathematics curriculum standards for compulsory education, with a focus on the development mechanism and characteristics of curriculum policy and its impact on public schools as well as the educational systems in China during the early 21st century. My goal is to present to the world the current situation of mathematics curriculum reform and development for compulsory education in mainland China since 2000.

Research shows the curriculum used before 2000 achieved certain goals (e.g., basic knowledge and basic skills training); however, it was also characterized as “complex, difficult, partial, and old”. Students suffered from rote memorization and drill practice. At the same time, teachers struggled with “draining students in a sea of problems”. There was too much emphasis on using test scores to screen students. The old curriculum was highly centralized, with little flexibility for local adaption. The policy makers began to reflect on education in schools, then come to the compulsory education mathematics curriculum reform in China, along with the release of the Mathematics Curriculum Standards for Full-time Compulsory Education (Trial Version) (MCSFCE) in 2001. The MCSFCE (Trial Version) proposed a basic reform idea: “Mathematics for All”, which says, “Everyone can learn valuable mathematics; everyone can learn the necessary mathematics; different people benefit from different mathematical development”.

After the first round of trial, problems arising from the implementation of the MCSFCE (Trial Version) including criticism from some mathematicians. The MCSFCE2011 differed from the products of previous curriculum in several fundamental aspects, such as the basic curriculum ideas, curriculum objectives, curriculum implementation (including guidance on textbook development), teaching suggestions, evaluation recommendations, and even curriculum management. Specifically, important revisions made in MCSFCE2011 include (1) for the value of mathematics and the function of mathematics education, MCSFCE2011 discussed the research object of mathematics and the relationship between mathematics and human society, and then gave the fundamental characteristic of mathematics, which were different from the statement of the trial version; (2) for the curriculum objective, MCSFCE2011 changed the “Two-Basics”: Fundamental Knowledge and Fundamental Skill, to the “Four-Basics”: Fundamental Knowledge, Fundamental Skill, Fundamental Idea and Fundamental Activity Experience; (3) MCSFCE2011 expanded the 6 core concepts (Sense of Number, Sense of Symbol, Idea of Space, Idea of Statistics, View of Application and Ability of Inference) into 10 core concepts (adding Perceptual Intuition of Geometry, Idea of Modelling, Operations Ability, and changing the Idea of Statistics into View of Data Analysis); (4) revisions were made to the concrete contents and the requirements, across all the domains. The content domains of “Space and Figure”

and “Practice Synthetic Application” were revised into “Space and Geometry” and “Synthetic and Practice”. The MCSFCE2011 led to deep changes in ambitions, curriculum content, teaching methods, textbooks and assessment methods. These changes prompted the development of mathematics education in China.

However, as the curriculum reform goes on, the revision of curriculum standards never stops. In 2019, the Ministry of Education began a new round of curriculum standard revision. Important revision directions include: (1) developing core mathematical literacy for compulsory education stage; (2) integrating interdisciplinary knowledge; (3) advocating unit-based teaching design; (4) promoting project-based, collaborative and inquiry learning; (5) carrying out literacy-oriented assessment; (6) highlighting the incorporation of technology in teaching and learning. At present, the newest curriculum standard is still under revision and consultation, expecting to be officially released in 2021.

To sum up, the path of reform was an exploratory process. It was necessary to synthesize theory and practice from mathematics, education, psychology and many other disciplines, pooling resources from all areas and levels, from the most academically high-achieving to the rural schools. The success of the curriculum reform demands rigorous academic attitudes, national responsibility and steady work.