

Chapter 4

Direction of Changes

Mathematics and the School Curriculum

4.1 Students need to develop a positive attitude towards learning in order to lead meaningful lives and remain competitive in the society of the 21st century. So far as the rapid growth of knowledge in the information age is concerned, mathematics has unquestionably become a necessity for every individual to contribute towards the prosperity of the society. Under the existing framework of the school curriculum, mathematics education should achieve specific aims in several aspects, such as intellectual, communicative, social and moral, personal and physical, and aesthetic.

The Role of Mathematics in the School Curriculum

4.2 Mathematics is essential for everyone in the modern society. Many of the developments and decisions made in industry and commerce, the provision of social and community services as well as government policy and planning etc., to some extent rely on the use of mathematics. However, the high technology like computers and calculators has profoundly changed the world of mathematics education. It is not only what aspects of mathematics are essential for learning, but also how mathematics is done and what attitude towards mathematics learning is fostered. Therefore, apart from mathematical content, processes and attitude are also essential core components for mathematics learning at various stages of schooling. Mechanical drilling and impractical topics are no longer essential and relevant.

4.3 The general aims of mathematics education are to develop our youngsters' knowledge, skills, concepts, confidence and interest in mathematics to enable them to master mathematics, and more importantly to further develop a positive attitude towards mathematics learning and related core competence, such as problem solving, communication, numeracy and logical reasoning throughout their life time. It should be an integral part of the general education and hence becomes a key learning area of the school curriculum of HK.

4.4 Students should acquire and interpret mathematical information for processing problems and tasks efficiently and accurately and be able to consolidate their mathematical

knowledge and develop procedures for solving the problems. This will accomplish mathematics learning as well as developing students' problem solving ability for life-long learning. In this way, students would progressively develop a capacity to solve problems and mathematics tasks with confidence.

4.5 In mathematics education, emphasis should also be placed on the development of positive attitude among students when going through the problem solving procedures. Mathematics learning can develop students' abilities to appreciate the beauty of nature and provide them with opportunities to enjoy the excitement and pleasure brought about by accomplishing mathematics tasks.

4.6 Mathematics provides a powerful means of communication. It can be used to present information in many ways like figures, tables, charts, graphs and symbols which can be further manipulated to deduce further information. Students have to develop ability to share information and ideas through describing, questioning, reasoning and explaining with mathematical concepts and knowledge. Through the communicative process, students will also expand their capacity from working individually to solving problems in a collaborative way.

4.7 Mathematics is the basis of scientific development and technology and an essence in many other fields. It is an analytical tool for studying other disciplines. Mathematics learning helps students enhance their understanding of the world. Therefore, students need to reach certain levels of mathematics standards for supporting advanced study in these disciplines and for further development in a majority of professions.

4.8 Mathematics should also be treated as an intellectual endeavour and a mode of thinking rather than a tool. It is a creative activity in which students can be fully involved and display their imagination, initiative and flexibility of mind. During the learning process, students should be encouraged to appreciate the beauty of mathematics. They should gradually develop their mathematics potential by forming their own conception of the discipline and realizing that mathematics plays a central role in the human culture.

4.9 In line with the above directions, the specific aims of the mathematics curricula at both the primary and secondary levels have been developed in the revisions of the Primary and Secondary Mathematics Syllabuses. Care has been taken to ensure that these two sets of specific aims, though self-contained, are complementary to each other. They are listed in Appendices 3 and 4.

Looking Ahead

4.10 We propose that the curriculum content of the primary and secondary mathematics curricula should be developed to materialize these aims. Moreover, explicit statements for various aspects of the specific aims at the sixth form level and in each subject should be developed with reference to those aims of the primary and secondary mathematics curricula. This will help to form a holistic view of what mathematics education is and how mathematics education can contribute towards the aims of the school curriculum.