In Focus …
Mathematics Education in Malawi
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Malawi is an independent nation in southeastern Africa. The country is 837 km long with a width ranging from 80 km to 160 km. It has a total area of 118 484 km^2 and a population of 8.5 million.

Malawi gained independence from Great Britian in 1964 and since then, it has intensified its efforts on expanding educational opportunities for Malawians. Malawi's three-tier education system is comprised of a primary, secondary, and tertiary level. The primary level, secondary level, and some institutions at the tertiary level are centrally controlled by the Ministry of Education and Culture. The primary school system comprises an eight year program with an entry qualifying age of six years. Each year is called a Standard. The secondary school program is of a four year duration. Each year is called a Form. Forms 1 and 2 are called junior secondary and Forms 3 and 4 are senior secondary. The higher education level comprises technical colleges, primary school teachers' colleges, nursing schools, and a university that is controlled by a board of governors.

The University of Malawi, founded in October, 1964, consists of four constituent colleges: Chancellor College, offering degrees in the sciences, humanities, administration, law, and education; Bunda College of Agriculture, offering degrees in agriculture; Polytechnic College, offering degrees in business, engineering, and other technical areas; and Kamuzu College of Nursing, offering diplomas in nursing. A medical college is currently under construction.

Primary Mathematics Education

Since Malawi's independence, mathematics education in the country has undergone several transformations. The first change came in the 1960s soon after the country's independence. It was a short lived modern mathematics program. Due to the lack of clear information, suitably prepared teachers, and suitable learning materials, this program was found to be faulty and thus, people in the country complained about it. Consequently, in 1972, an

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education conference endorsed change from modern mathematics back to traditional mathematics.

In 1980, there was another need to revise the mathematics syllabi in order to accommodate the metric system. Malawi adopted the metric system on January 1, 1982. The Malawi Ministry of Education and Culture, recognizing the importance of mathematics for the country's future development, brilliantly handled the conversion. It introduced the international system of units in the school syllabi and textbooks in 1980, instructing schools to teach this new system of units and to totally discard the imperial units. This has been one of the most successful changes that the education system has implemented.

In 1987, a major curriculum review was initiated. This was in response to a 1985 - 1995 Education Development Plan. The major goal of this development plan is to improve education in order to accommodate the societal changes that have taken place in Malawi since its independence. An official mathematics teaching syllabus for primary schools states that "the most recent role of mathematics is to develop mathematical skills applicable in solving everyday problems" (Malawi Institute of Education, 1990, p. 1). The spirit of the changes brought about by the recent effort are very well registered in the same document by the following words:

> The current primary Arithmetic syllabus has had some problems. The first one is the discontinuity in the development of concepts from one grade level to the other. … The proposed primary mathematics intends to rectify the stated problems. It is hoped that the provision of appropriate learning materials and use of teaching/learning strategies that promote learning by investigation. . . The teaching syllabus has been developed to replace the traditional -teacher centered [*sic*] by a more child-centered approach. (Malawi Institute of Education, 1990, p. 1)

The new mathematics program emphasizes problem solving and investigations. The implementation of this new program has been carefully planned. Students in Standards 1 and 2 are currently following the new program. The Ministry of Education and Culture launched the new program in 1990 starting with a fresh Standard 1 class while remaining classes continued to follow the "old" program. The new program will take eight years to implement and educators are optimistic of a successful implementation.

Secondary Mathematics Education

The secondary school mathematics program has experienced changes similar to the primary school. The mathematics curriculum at this level was influenced by the modern mathematics movement, the push back to traditional mathematics, and the metrication of the country. In 1985 the Ministry of Education and Culture published a Teacher's Guide for Junior Secondary School Mathematics. The current state of Malawi secondary school mathematics education can be determined by studying the introduction to the Teacher's guide:

> This guide is intended to show teachers how they can help their students to learn, understand and enjoy mathematics. It is hoped that the guide will also assist teachers to get a better understanding of the subject and so enable them to teach better and more effectively so that children can ultimately benefit from the lessons. … The teacher is reminded to always impress upon students the need for accuracy, neatness and speed. However emphasis on speed should not be such that it causes anxiety in students. (Malawi Ministry of Education and Culture 1985, p. 3)

The secondary school mathematics syllabus contains four subjects: algebra, arithmetic, geometry, and trigonometry. A number of schools teach advanced mathematics. The Ministry is currently moving towards integrating these subjects.

Tertiary Level Mathematics Education

At the tertiary level, primary school teachers' colleges have been the most affected in their mathematics programs as they responded to the changes in mathematics education at the primary school level. Rigorous activity took place in the years 1980 to 1983 under the auspices of United Nations Educational, Scientific, Cultural Organization/ United Nations Development Project (UNESCO/UNDP). This activity was in the form of a project whose emphasis was on developing curriculum instructional materials. At the end of the first phase of the project, the following curriculum materials had been produced: Teach Metric, Arithmetic Teaching Syllabus for Primary Schools, Statistics, and Arithmetic Teacher's Guide for Standard 1.

As for the university, the department of education responded to the 1985 - 1995 education development plan by creating a subcommittee on mathematics education in order to study, analyze, and evaluate the mathematics education program that was being offered for preparing secondary school teachers. In May of 1986, the subcommittee comprised of two professors from the Education Department, a mathematician, and a curriculum developer in mathematics education prepared a document entitled *What Mathematics Must a (Secondary) School Teacher Know?* The subcommittee responded, "As much as possible" (Subcommittee on Mathematics Education, May, 1986, p. 1). Nevertheless, it identified the following five categories as essential:

A. Thorough knowledge of the present secondary school mathematics content.
B. Knowledge of material that may be included in future syllabi.
C. An appreciation of the application of mathematics.
D. A deeper knowledge and understanding of mathematics related to A and B.
E. Wider knowledge of mathematics in general with special emphasis on students' understanding of what mathematics is.

Conclusion

The school aged population in Malawi is more than 2 million, and Malawi has just introduced free education (not compulsory) starting with the 1992 Standard 1 class. Therefore, as mathematics educators look into the future and consider what to do with the millions of school aged children, they are challenged with issues of how to provide quality mathematics education to so many. This to me is the greatest challenge facing mathematics educators. Fortunately, Malawian educators are aware of the essence of education. As an official of the Malawi Ministry of Education and Culture put it, "… certain aspects of our way of life, certain kinds of knowledge, certain attitudes and values must be regarded as so important that their transmission to the next generation should not be left to chance in our society" (Malawi Institute of Education, 1988, p. 3). Is this not what remains when everything else is done or gone?

References

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