

Models of Mathematics Curriculum Development in Egypt

Fayez M. Mina, MA PhD C.Math FIMA

Emeritus Professor, Department of Curriculum and Instruction, Faculty of Education,
Ain Shams University, Roxy, Heliopolis, Cairo, Egypt fmmina@link.com.eg

Abstract The need for developing mathematics curricula was clarified. Models of mathematics curriculum development in Egypt were identified as: "Temporary Committees" (TC), center of developing curriculum and educational materials (CDCEM), "National conferences" (NC) and "Educational standards" (ES). The advantages and disadvantages of each one of these models were evaluated. Then a new model was suggested covering the whole advantages of these models and avoiding their disadvantages.

Introduction

A mathematics curriculum is a system, its components are: Aims, content, methods of teaching, educational media, educational environment, educational activities and evaluation. The whole mathematics curricula is a sub-system of many wider systems such as; curricula taught, educational system, national culture, regional culture humanistic culture at large. Curriculum development - in general - stems from attempting to cope with changes in these wider systems, differences between educational outputs and the intended ones and inconsistency (ies) between the components of curriculum. So, the need of curriculum development - whether in mathematics or other subjects - seems to be continuous. Normally, there is an attempt to develop mathematics curriculum⁽¹⁾ each 3-7 years with regards to many considerations⁽²⁾. The process of development itself usually follow - procedures, which can be classified into common ones, referred to as "models".

Models of Mathematics Curriculum Development in Egypt

Models of mathematics curriculum development in Egypt in the past five decades - or so, could be classified as follows⁽³⁾: Temporary committees (TC), Centre of developing curricula and educational materials (CDCEM), National Conferences (NC) and Educational Standards (ES). The following is an explanation to each model:

1- Temporary Committees Model (TC):

A committee to develop a mathematical curriculum is formulated by a ministerial decree from some professors of mathematics in universities, some professors of mathematics education as well as some mathematics educators⁽⁴⁾. The committee hold some meetings and write a report with the suggested changes - almost in the content of this curriculum. Once the report is accepted by the minister, the committee finishes its work.

2- The Centre of Developing Curricula and Educational Materials Model (CDCEM):

This centre was established in 1990, to be affiliated with the office of the Minister of Education⁽⁵⁾. The major task of the centre is issuing school text-books. The normal procedures were as follows:

- a) Writing a scope and sequence for mathematics covering the whole basic education stage (1-8 grades). Writers of a particular text-book are supposed to consider what is taught in the corresponding grade.
- b) Formulating a team of writers⁽⁶⁾. The team put a plan to accomplish the task, with individual assignments to its members.
- c) The products of the team should be seen - and are subject to modification, by an editor.
- d) The team writes a teachers' guide for that text-book.
- e) Experimenting - at least - a sample of topics and their guides in different parts of the country.
- f) Introducing necessary changes in the text-book and the teachers' guide.
- g) Putting a plan for introducing the text-book and the teachers' guide to schools. This plan normally includes in-service teacher education sessions⁽⁷⁾.

3- National Conferences (NC):

Some conferences are held at the national level representing university professors - including professors of education and some professors of educational research centers, educational administrators, teachers, students, parents, political powers and so on. They are hold with participation of non - governmental organizations⁽⁸⁾. Two ideas were stressed in these conferences; The first is that education is much more effective in the

life of society than a group of people decide on its matters only, while the second is that the importance of education is well recognized⁽⁹⁾. Two conferences were devoted to develop two educational stages⁽¹⁰⁾.

4- **Educational Standards (ES):**

In 2003 the educational system in Egypt has joined the movement of "National Standards". A three volumes book included "National Standards for Education in Egypt" was issued with six major documents, one of them is devoted to curriculum⁽¹¹⁾. This document includes a part for mathematics curriculum. In the academic year 2006/2007 the process of developing mathematics education according to the suggested standards was initiated. The year 2006/2007 witnessed the writing of mathematics text-books and teachers' guides for grades 1-3 primary in a national competition among Egyptian publishers according to the educational standards, while the year 2007/2008 witnessed almost the same thing for the fourth primary and the first preparatory⁽¹²⁾.

Advantages and Disadvantages of the Existing Models of Developing Mathematics Curricula.

Before proceeding, a reference should be mentioned to hinders of changing outcomes of mathematics education development in Egypt. Some of these hinders are: The system of evaluation, the difficulty in introducing radical changes into methods of teaching, the use of educational media and educational activities, and the prevailing environment of education.

It must be noted that almost all attempts to develop curricula – and mathematics curricula took place in primary and preparatory education, without having secondary education⁽¹³⁾.

Keeping in mind this, the major advantage of TC is that it is easy to formulate and to work out. On the other side the major disadvantage that they are almost confined to the content, without dealing – or attempting to deal with – the content, without dealing – or attempting to deal with – the other components of curriculum.

The model of CDCEM has many advantages such as representation of almost all concerned people, editing the work, having a teachers' guide, experimentation and in-service teacher education. The major disadvantages are that it is based on the "scope and sequence" which has become rather historical and the hesitation to introduce major changes in the content of mathematics curricula⁽¹⁴⁾.

The assumptions underlying NC, can constitute their basic advantages, but disadvantages can be seen in the weak representation of different sectors as well as the formality that their conclusions are dealt with⁽¹⁵⁾.

Although the writer has some reservations on the movement of standards, it could help in authoring school text-books. The major advantages of ES are that it allows teaching advanced topics from primary education –eg probability, and that it gives much more interest to some neglected topics in primary education - eg estimation and mental arithmetic⁽¹⁶⁾.

The suggested model

Needless to say, the temporary model is easily rejected. Keeping in mind a lesson from NC that different concerned groups must be represented as well as thinkers all over the country and NGO's in the process of curriculum development at any stage, the suggested model can be a mixture of CDCEM and ES. A rather detailed description to the suggested model is presented as follows:

- 1- Identifying standards and indicators (aims)
- 2- Drafting a text-book and a teachers guide. (whether by charging some experts or a competition).
- 3- Introducing applications in other disciplines and possibilities of integrated topics.
- 4- Modifying the drafts according to the last point.
- 5- Holding in-service education sessions for teachers.
- 6- Experimenting the text-book and the teachers guide, including all the sub-systems of curriculum.
- 7- Evaluating of the new materials by samples taken from all concerned people.
- 8- Re-modifying the new materials according to the results of evaluation.

- 9- Checking regularly the new materials according the needs for curriculum development (mentioned above).
- 10- Introducing necessary changes, with a possibility of a total or a radical changes.

Notes

- (1) Apart from partial modifications.
- (2) Such as, availability of needed budget, public opinion views- whether teachers or parents or others, plans and possibility of in- service teacher education... etc.
- (3) Procedures might differ within the same model. Actually, a model is an abstraction of the common procedures taken in that model.
- (4) In some cases, the findings of these committees are discussed with some teachers, though no changes obvious have been reported as a result.
- (5) The writers mean by this models the products of this centre within the period 1990-1993, which includes mathematics text- books for the first four grades of primary education. Since 1993, the centre concentrates on editing and typing the text-books which won in public competitions.
- (6) Including some professors of mathematics education, some mathematics inspectors and a teacher of mathematics teaching the same grade.
- (7) These training sessions are hold to - at least - trainers of trainers, with regard to the great numbers of teachers of primary education.
- (8) Especially the Egyptian Society for Development and Childhood.
- (9) Mrs. President chaired all these conferences and some of the best thinkers participate in them.
- (10) In particular; The National Conference for Developing Curricula of the Primary Stage (1993) and the National Conference for Developing Preparatory Education (1994), in addition to other national conferences in education.
- (11) Other documents include the standards of: An effective school, teacher, distinguished administration, societal participation and learner.
- (12) The plan of the Ministry of Education in Egypt includes that mathematics text-books took place in 2008/2009 for the 5th grade primary and the 2nd grade preparatory, while in the academic year 2009/2010 covering all the primary and preparatory grades.
- (13) Recently (in 2008) , there was a plan to change the structure of secondary education, its curricula, admission to higher education as well as the process of evaluation, to be administered by the year 2013.
- (14) E.g. teaching probability and the use of calculators in primary education.
- (15) A hint should be given to the facts that the major slogan of the conference about primary education is that pupils are asked to study basically “activities” and the slogan of the conference concerning preparatory stage is to “empower students to get keys of knowledge”. In practice, no procedures have been taken to put these slogans into action.
- (16) Nevertheless, the written document about the characteristics of the subject matter included – sometimes - vague phrases. Further, in-service education sessions were limited and teachers guides were printed late, so, the new text-books were badly received by some teachers, parents as well as pupils.

References

- (1) Labib, Roshdi and Mina, Fayez (1993). **Curriculum; the System of the Content of Education**, Second edition. Cairo: The Anglo- Egyptian Bookshop. (In Arabic)
- (2) McNeil, John (1996). **Curriculum, A Comprehensive Introduction**, Fifth edition. New York: Harper Collins College Publishers.
- (3) Mina, Fayez (2001). **Education in Egypt, Reality and the Future until 2020**. Cairo: The Anglo-Egyptian Bookshop. (In Arabic).
- (4) (2003). **Issues in Curricula of Education**. Cairo: The Anglo-Egyptian Bookshop (In Arabic).
- (5) (2006). **Issues in Teaching and Learning Mathematics**. Cairo: The Anglo- Egyptian Bookshop (In Arabic).
- (6) Ministry of Education (2003). **The National Standards for Education in Egypt** (Three volumes). Cairo: Ministry of Education.