The Analysis of Intended Mathematics Curriculum of Primary Schools in Mongolia

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Structure of the Paper

- The Concept of Curriculum
- Historical Review of the Curriculum
- The Structure of Mathematics
- Standards of Primary Schools
- Characteristics of Mathematics
- Standards of Primary Schools
1. The Concept of Curriculum

According to Howson (1981), curriculum must be more than syllabus— it must encompass aims, contents, methods, and assessment processes.

There are different levels of curriculum, which are labeled as (a) intended, (b) implemented, and (c) attained curriculum (Robitaille et al. 1993).
Exhibit 1: TIMSS Curriculum Model

1. National, Social, and Educational Context
   - Intended Curriculum

2. School, Teacher, and Classroom Context
   - Implemented Curriculum

3. Student Outcomes and Characteristics
   - Attained Curriculum

(Robitaille et al. 1993, p. 26)
2. Historical Review of the Curriculum

Before 1990, in socialist era, the representative for the intended mathematics curriculum was the Program of the Mathematics Subject.

According to Begz (2001):

1. Period, between 1900 and 1940

   The curriculum tried to include some indigenous subjects, which related to Mongolian traditional lifestyle.
2. **Period, between 1941 and 1980**

   Modern European education was introduced in Mongolia, while it departed from the subjects that related to local and indigenous circumstances

   - Translation of textbooks
   - 100 Russian teachers

From teacher-centered learning to student-centered learning,
Ecosystem of learning was not limited by walls of classroom,
Bloom Taxonomy was emphasized in students` evaluation
3. The Structure of the Mathematics Standards of Primary Schools

The representatives for the intended mathematics curriculum in Mongolia are the official documents: the mathematics standards and the content framework of primary schools.
The mathematics standards are organized into four parts:

3.1 The concepts of mathematics education
3.2 The Content standard
3.3 The Evaluation standard
3.4 The Foundations of methodology development
3.1 The concepts of mathematics education

- need of mathematics education
- need of individual
- need of society
- the goal of the mathematics education in Mongolian society.
3.2 The Content standard

- Number and Calculation
- Algebra
- Geometry
- Probability and Statistics
  - Objectives
  - Knowledge
  - Skills
  - Fundamental process of learning
  - Continuity code
3.3 The Assessment standard

Categorized criteria for assessment of students' mathematics learning based on four domains and students' cognitive stages

3.4 The Foundations of methodology development

The principles describe particular features of high-quality mathematics education
4. Characteristics of Mathematics Standards of Primary Schools

- Principles in Foundation of Methodology Development
- Four Comprehensive Potentials in Mathematics Standards
- Students` Real Life Problem Solving
- The Concentrator Model of Mathematics Contents
4.1 Principles in Foundation of Methodology Development

- Equity principle
- Selecting principle of learning content
- Teaching principle
- Learning principle
- Technology principle
- Assessment principle
Principles of Mongolian standards

**Teaching Principle:** The teaching should to be based on theory of educational philosophy and psychology, knowledge and management

**Learning Principle:** The learning should to be based on the principle which students create knowledge by doing

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Principles of the NCTM

**Teaching Principle:** Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well

**Learning Principle:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge
4.2 Four Comprehensive Potentials in Mathematics Standards

- Communicate Mongolian and mathematical language
- Express own thinking, logically
- Recognize by modeling the mutual relation of real life problems
- Solve the faced problems by modeling and calculating
Communicate Mongolian and mathematical language

Please write the following sentences by numbers and read, loudly

37. Стандарт хэлбэрээр бичээрэй.
   а) 39 сая 700, долоон сая гучин ес, гучин найман сая найман зуун арван мянга,
   б) I орны 9 нэгж, II орны 3 нэгж, IV орны 5 нэгж, VI орны 8 нэгж, VIII орны 6 нэгжээс бутсан тоо
   в) Нэгжийн ангиийн 117 нэгж, мянгын ангиийн 20 нэгж, саяын ангиийн 800 нэгжээс бутсан тоог бичээрэй.
Express own thinking, logically

Please explain how we can represent size of the proper fractions by real things. 1

Recognize by modeling the mutual relation of real life problems

Please find out the price of products in “ELBA” shop by using next table and discuss the price.

<table>
<thead>
<tr>
<th>Д/д</th>
<th>Барааны нэр</th>
<th>1 бурийн үнэ</th>
<th>Төо ширхэг</th>
<th>Бух үнэ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Зурагт</td>
<td>? төг</td>
<td>7ш</td>
<td>875 000 төг</td>
</tr>
<tr>
<td>2</td>
<td>Хөрөгч</td>
<td>? төг</td>
<td>6ш</td>
<td>1 680 000 төг</td>
</tr>
<tr>
<td>3</td>
<td>Угаалгын машин</td>
<td>? төг</td>
<td>10ш</td>
<td>1 520 000 төг</td>
</tr>
<tr>
<td>4</td>
<td>Тоос сорогч</td>
<td>? төгг</td>
<td>9ш</td>
<td>531 000 төг</td>
</tr>
</tbody>
</table>
4.3 Students` Real Life Problem Solving

4.3 Students` Real Life Problem Solving

Сарны дэлгүүрээс компьютерийн хулгана 5 500 төгөрөөр, камер 25 000 төгөрөөр худалдан авахад түүнд 2 700 төгөрөөг улдсэн. Сарны анх хэдэн төгөртэй байсан бэ?

Нийлбэрийг зуутаар тоймлоорой.
Улгэрлэвэл: 5 642 + 9 482 = 5 642 + 9 482
+ 5 642
= 15 124
= 15 124 ≈ 15 100

512. Тойрог дугуй орсон өөр ямар жишээ байж болохыг ярилаарай.
4.4 The Concentrator Model of Mathematics

Contents

- One and two digit numbers
- Three digit numbers
- Six digit numbers
- Multi digit numbers
- Algebra
- Geometry
- Probability and statistics
- Fraction

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Video Viewing

Grade 4 of the Primary school in aimag. The class was organized by 5 groups. In the beginning of the class, a teacher tells the rule of the group work.

- All students of each group need to participate, actively
- All students of each group will solve problems one by one
- Groups will be assessed end of the lesson
Topic: Addition and Subtraction of Natural numbers
Thank you very much