The Pashai Case Study of ‘Multilingual Education’

(Finger math as mathematical logic development in early childhood and primary education with the MLE track, the Afghanistan Pashai MTB-MLE program case)

by Ju-Hong Yun

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Finger Math
Introduction

Problem

- Up to one in five people may have a form of dyscalculia (or math dyslexia)

- In the case of minority language groups, this symptom is more common
Rationale

1. Finger Math as an effective tool to prevent dyscalculia.

2. Direct & indirect benefits:
   - giving confidence and competency in math logic
   - developing logical thinking through practicing multisensory strategies
- boosting their algorithms with multisensory math strategies

- giving fun class mood to reduce drop out situations
Finger Math’s Characteristics:

- an interactive way of teaching

- multisensory instruction with linkage of visual, auditory, and kinesthetic-tactile modalities.

- its modalities are linked with the user’s brain through the nerve system.
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☑ Logical Approach
✓ Multisensory Approach
Finger Math’s Benefits

1. Developing scientific, logical thinking using learners’ five intrinsic senses (seeing, hearing, speaking, sensing through touch by using fingers to count, mental calculation: brain activities) and practicing its activities and its logical consequences
2. Helping learners understand mathematical principles through understanding the relationship between addition and multiplication as well as subtraction and division (Example: “Multiply means to make a number many as an extension of addition”)
3. Developing learner’s creativity especially through mental calculation activities and finding their own ways of calculation and math thinking patterns
4. Increasing the learner’s perseverance and concentration ability: increasing concentration ability is a very natural consequence of the finger math activities
5. Increasing learner’s ability to memorize using their mental calculation activities in the advanced stages of the finger math
6. It gives a more relaxed and fun atmosphere and also raises confidence in math abilities so that the learners can “open doors” to new information.
7. It is economic in that it doesn't require much funding for making teaching and learning materials
8. It is cost-effective in that it doesn’t require much time to train teachers, and already existing teachers can easily become the finger math teachers within one or two weeks’ intensive training.
Finger Math’s Principles:

1. Go slowly and apply step by step (Accuracy is more important than speed for solving problems)

2. Teach your students a strategy one step at a time - Everything begins with one small step. And the small steps add up to a bigger accomplishment.

3. And above all, HAVE FUN!
Conclusion: Logic & mathematics development

Finger Math’s multisensory techniques increase active awareness. Learners, especially those with learning challenges, benefit from being able to pull in memory hooks (mnemonics) They inspire children to enjoy doing math and to let them use the logical parts of their brains rather than experiencing the anxiety that sometimes accompanies the difficult process of learning math. The biggest beneficiaries of finger math are preschoolers and children in minority language groups who have limited educational resources.
(Appendix): 1. Finger Math’s Efficacy

Research data 1 (since 2011)

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This is the list of students and their GPA who were not in the Pashai MLE preschool program before enrolling in the government school. The collected data from the public school and Sohrab in 2016, September.
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This is the list of students and their **GPA who graduated from the Pashai MLE preschool program before enrolling in the government school.** The collected data from the public school and Sohrab in 2016, September.
2. Contents (of Finger Math curriculum)

Pre-number Topics

- Identifying circles, squares, triangles, rectangles, cubes and pyramids
- Comparing words — ‘few’, ‘fewer’ and ‘more’
- Comparing size using the words ‘longer’, ‘taller’ and ‘shorter’
- Comparing words — ‘heavier’ and ‘lighter’, ‘wider’ and ‘narrower’
- Comparing position using the words ‘left’, ‘right’ and ‘middle’, ‘above’ and ‘below’, ‘top’ and ‘bottom’ and ‘inside’ and ‘outside’
- Finding patterns using the words ‘similar pattern’ and ‘missing part of the pattern’
- Sorting and classifying ‘different’ and ‘same’
- Practicing pre-writing numbers and practicing direction
- Measuring weight, length, capacity etc. using local terms and general math terms
- (Describing and using different ways to measure time.)
- Number practices (Concepts & Reading and Writing practices)
- Finger Math: Addition, Subtraction, Multiplication and Division
3. Finger Math Teacher’s Guide
4. Quick overview Curriculum School Preparation Program

Quick overview Curriculum School Preparation Program

Year 1

Semester 1:
- pre-reading (Act. Book & start Pre-Primer)
- pre-writing (Act. Book & start Pre-Primer)
- oral L1 (Act. Book, Big Book & Big Picture)
- pre-math & counting 1-10 Pashai
- shapes & colours
- Act. Sheets, colouring pictures

Semester 2:
- pre-reading (Act. Book & finish Pre-Primer)
- pre-writing (Act. Book & finish Pre-Primer)
- oral L1 (Act. Book, Big Book & Big Picture)
- pre-math & counting 1-20 Pashai, writing 1-10
- Act. Sheets, pre-math activities

Semester 3:
- Primer Pashai (24 words, story- & primer-track, mainly oral, scribbling starts)
- Finger Math (pre-math from Math. Primer & Pashto counting 1-10)
- TPR (TPR schedule)

Year 2

Semester 1:
- Primer Pashai (24 words, story- & primer-track, mainly oral, scribbling)
- Finger Math (Pashto counting 1-20, writing 1-20, simple adding 1-20, simple Hi-5 1-20)
- Pashto (TPR repeat, Big Book & Big Picture in Pashto, Oral Activities in Pashto)

Semester 2:
- Primer Pashai (24 words, finish Primer, writing starts)
- Finger Math (Finger Math principles adding up to 20)
- Pashto (simple listening stories & activities)

Semester 3:
- Pashai-Pashto Transfer Primer
- Finger Math (subtracting, finish Math. Primer)
- Pashai (writing practise)
- Pashto (oral practise)
5. Pashai Multilingual Education Program (Curriculum)

Pashai Multilingual Education Program

Curriculum for year 1 & 2 of the School Preparation Program

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