MATH FOR ALL & ITS STRATEGIC PROGRAM FOR TEACHERS IN RESPONSE TO COVID-19 PANDEMIC

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OUTLINE

• About SEAQiM
• Math for All
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ABOUT SEAQiM

Southeast Asian Ministers of Education Organization
Regional Centre for Quality Improvement of Teachers
and Education Personnel in Mathematics
(SEAMEO : QITEP in Mathematics)

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Our Tagline

"Learning Mathematics Joyfully and Meaningfully"
Our Vision & Mission

• VISION
To be a centre of professional leadership in the area of mathematics education for teachers and education personnel within the framework of sustainability.

• MISSION
To provide quality professional mathematics education and services for teachers and education personnel in SEAMEO Member Countries.
Goals of SEAQiM

The SEAQiM is expected to provide high quality mathematics education relevant to 21st Century capability by:

1. Conducting continuous professional development programmes to promote joyful and meaningful mathematics teaching and learning.
2. Providing intellectual forums on mathematics education innovation.
3. Conducting research and development in mathematics education.
4. Establishing extensive networks and collaboration, information exchange and best practice sharing in the area of mathematics education.
5. Providing up-to-date data and information on mathematics education to policymakers.
Programme Area of SEAQiM

1. Courses & Workshops
2. Seminars/Symposiums/Conference
3. Research and Development
4. Serial Publications
5. Community Service Programme
Education For All (EFA) & Math For All (MFA)

• **Education For All (EFA)** is a global movement led by **UNESCO**
• Analogous to EFA, MFA also deserves attention.
• There are six goals of EFA and the analogy to the MFA.

<table>
<thead>
<tr>
<th>Goals</th>
<th>EFA</th>
<th>MFA</th>
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<tbody>
<tr>
<td>1</td>
<td>Expand early childhood care and education.</td>
<td>Sharpen math suitability for early childhood.</td>
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<td>2</td>
<td>Provide free and compulsory primary education for all.</td>
<td>Aligning the benefits of mathematics in basic education.</td>
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<td>3</td>
<td>Promote learning and life skills for young people and adults.</td>
<td>Promote math and thinking skills for young people and adults.</td>
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<td>4</td>
<td>Increase adult literacy by 50 percent.</td>
<td>Increase adult numeracy.</td>
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<td>5</td>
<td>Achieve gender parity by 2005, gender equality by 2015.</td>
<td>Dispelling the myths related to mathematics, and achieving a mathematical disposition.</td>
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<td>6</td>
<td>Improve the quality of education.</td>
<td>Improve the quality of mathematics education.</td>
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Why Studying Math?

The illiterates of the 21st century will not be those who cannot read and write, but, rather those who cannot learn, unlearn and relearn. (Alvin Toffler).

Mathematics is not about numbers, equations, computations, or algorithms: it is about understanding. –William Paul Thurston

Without mathematics, there’s nothing you can do. Everything around you is mathematics. Everything around you is numbers. –Shakuntala Devi
Why Studying Math?

1. Learning math is good for our brain. (research by Tanya Evans, Ryuta Kawasima, etc)
2. Mathematics is the universal language.
3. Real world application of math.
4. Learning math increase problem-solving skills (see a pattern, making model of problem, symmetry, etc).
5. Math is all around us and helps us understand the world better.
6. Math is used in practically every career.
7. Mathematics promotes wisdom.
What Happen Today With Math Education

• Math scores are almost always lower than the scores of other subjects.
• Mathematical anxiety is still a problem in education.
• Myths about math (math requires logic not intuition, math is not creative, just for a genius with talent, only if you good in counting, always exactly right for a solution, men are better in math, etc.)
• Difficulty learning mathematics.
• Many misconceptions in learning mathematics.
• Numeracy or mathematical literacy is still low.
• Mathematics learning practices still need to be improved and encouraged to be more adaptive, fun, and meaningful.
An Example, A Problem With MFA
Math For All (MFA)

We regard MFA as an effort to make mathematics more learner-friendly, also more essential, accessible, fun and meaningful in education, and more useful and appreciated by global community.
MFA in Pandemic Era

During the pandemic, many challenges are faced in providing a fair, fun and meaningful mathematics education.
Education response to Covid-19 pandemic

• The World Bank identifies three possible scenarios for the loss of learning: a reduction in **average learning levels** for all students, a widening of the **distribution of learning achievements** due to highly unequal effects of the crisis on various populations, or a significant increase of **students with very low level of achievement** due in part to massive dropouts.

• This suggests **25 per cent** more students may fall below a baseline level of proficiency needed to participate effectively and productively in society, and in future learning, a result of the school closures only.
Education response to Covid-19 pandemic

Based on “Policy Brief: Education during Covid-19 and beyond” (UN), there are four recommendations:

1. Suppress transmission of the virus and plan thoroughly for school re-openings.
2. Protect education financing and coordinate for impact.
3. **Build resilient education systems for equitable and sustainable development.**
   - In this regard, governments could consider the following: focus on equity and inclusion; reinforce capacities for risk management, at all levels of the system; ensure strong leadership and coordination; and enhance consultation and communication mechanisms.
4. **Reimagine education and accelerate change in teaching and learning.**
   - The following entry points could be to the fore of our efforts: focus on addressing learning losses and preventing dropouts, particularly of marginalized groups; offer skills for employability programmes; support the teaching profession and teachers’ readiness; expand the definition of the right to education to include connectivity; remove barriers to connectivity; strengthen data and monitoring of learning; strengthen the articulation and flexibility across levels and types of education and training.
Math Teaching In Pandemic Era

Essential & Practicable of Mathematics Content

• Focus on essential concepts and procedures in mathematics.
• Use simple and daily-life context.
• Utilize problem posing from children.
• Consider local situation where children live.

Reduce Symbolization and Formalism

• Shifting from rigid-formalism to more intuitively.
• Representing a formula or procedure with example (inductively).
• Representing a proof with example.
• Making a formula be “doing formula”. It could be more making sense for children.
• Making algorithm be “understandable”. Don’t too fast!

Emphasize on Mathematical Thinking Skill

• Pattern recognition
• Logical reasoning
• Creative problem solving
Our Strategy to Ensure MFA on Programme for Teacher

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<tbody>
<tr>
<td>1</td>
<td>Choosing a suitable regular program during a pandemic</td>
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<td>2</td>
<td>Developing the suitable programs during a pandemic</td>
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<td>3</td>
<td>Adjusting program implementation during a pandemic</td>
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<td>4</td>
<td>Strengthening literacy &amp; numeracy in every program</td>
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<td>5</td>
<td>Focus on thinking skills related to 21st century skills</td>
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<td>6</td>
<td>Provide appropriate assignments for teachers in our program</td>
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<td>7</td>
<td>Simple and easy to access for resources in course</td>
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Focus on STEM, Joyful Learning and ICT in Math Education
Mathematics becomes adaptive, easy, and interesting using an integrative approach like STEM
Our STEM Programmes

The main feature of our STEM programmes is an emphasize on **mathematics**. Mathematics can be learnt joyfully with STEM activity.

**Pandemic-friendly**

The activities are low-cost, design teachers’ own STEM lessons, considering the limitation of online learning, and also applying the health protocol.
Why Joyful Learning?

- The main problem of learning mathematics is in the perception and attitude towards mathematics.
- Joyful learning can be implemented in an easy and inexpensive way, even in online mode.

Mathematics should be taught in a fun way so that students are excited and easy to understand mathematics.
Why ICT?

Mathematics can be easier and more fun if it is learned using appropriate media and technology.
Virtual Courses & Workshops

# Regular Course (on STEM in Mathematics Education)

RC, the program offers 100 hours of professional development, using zoom and LMS. Around 40 participants are selected from Indonesia and other SEAMEO member countries.

# In-Country Course

IC is conducted for 32-46 hours, either by SEAQiM (by invitation) or by an inviting agency.

# Workshop on STEM

Workshop is conducted for 1-2 days, either by SEAQiM (by invitation) or by an inviting agency.

How do we organize it, in order to learn math?

1. Shortened duration in zoom and also for theoretical exposure.
2. Project orientation with with clear mathematics goals.
3. Low-cost and easy construction material for STEM.
6. Optimization chat room for discussion certain topic and activity.
7. Break-out session for making more active discussion and collaboration.
Virtual Courses & Workshops

#Regular Course (on STEM in Mathematics Education)

# In-Country Course

#Workshop on STEM
FtF Courses & Workshops

# In-Country Course

IC is conducted for 32-46 hours, either by SEAQiM (by invitation) or by an inviting agency.

Workshop is conducted for 1-2 days, either by SEAQiM (by invitation) or by an inviting agency.

STEM Camp for 4 days, conducted outside SEAQiM with the possibility for outdoor activities.

How do we organize it, in order to learn math?

1. Held in a place around and closest to the SEAQiM office.
2. Project orientation with clear mathematics goals.
3. Low-cost and easy construction material for STEM.
5. Activities carried out in small groups, according to health protocols.
6. Attempt to outdoor activities as well as to maintain health protocols.

# Workshop on STEM

# STEM Camp
FtF Courses & Workshops

# In-Country Course
# Workshop on STEM
# STEM Camp
Academic Forums

• initiated early in the pandemic to help teachers deal with difficult situations
  • 10 series

National webinar series

International webinar series

• to discuss important themes related to mathematics learning in the pandemic era
  • 3 series

• to disseminate topics about learning with an integrated approach (STEM)
  • Blended mode

International conference
National webinar series: (Learning with SEAQiM)

- As a quick response to assist teachers in dealing with LFH at the start of the pandemic.
- The theme chosen is interesting and important to assist teachers on distance learning.
- Especially for teachers in Indonesia who are affected by the pandemic.
International webinar series

- The selected theme is adapted to the current conditions.
- Total of 400 to 1000 participants are registered.
- Collaborations with regional and international institutions.
ISMEI 2020

- International Joint Conference on STEM Education (IJSE)
- Collaboration with IPST & SEAQiS
- More than 100 presented papers on STEM and mathematics education by participants from Indonesia and other SEAMEO member countries.
- Held on blended mode, with health protocols.
Another response:

#Competition

Mathematics contest “Inspiring Learning during Pandemic”

Geogebra innovative contest for pandemic situation

- a competition for math teachers related to best practices during the pandemic and creativity in creating digital content.
- to support teachers' efforts to endure meaningful learning during the pandemic.
We continue to publish quality journals with an improved editorial board and indexed journals.

In 2020, we have launched a bilingual bulletin (English and the official local language) for mathematics teachers in Southeast Asia.

These publications are to ensure and continue to help teachers, gain insight and understanding of fun and meaningful mathematics learning.
Goals:
- Improve teaching and learning of mathematics in Southeast Asia region;
- Determine the extent of students’ understanding of mathematics concepts;
- Diagnose the strength and weakness of student learning, and
- Provide input for regional Centre on the nature and direction of teacher training.

- Consists of higher-middle-lower order thinking questions to diagnose students’ strength and weakness in learning mathematics.
- For students of Grade 5, 8 and 10 in SEA countries
Another response:

#Community Service Program

Model School & STEM Village

• Model School: to help teachers improve competence and solve learning problems during the pandemic.

• STEM Village: This aimed for mothers and children in STEM education and activity (in pandemic era, we just serve activity for mothers)
Thank You