



筑波大学
University of Tsukuba



SEAMEO-The University of Tsukuba Symposium IX

Theme: Resilience for Global Citizenship

Sub-Theme: Challenges in Education under COVID-19

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

Dr. Sumardyono

Director of SEAQiM (SEAMEO Regional Centre for QITEP in Mathematics)

Yogyakarta, Indonesia

Virtual

11 February 2021

OUTLINE



- About SEAQiM
- Math for All
- Strategic Program for Teachers

ABOUT SEAQIM



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Our Tagline

*"Learning
Mathematics
Joyfully and
Meaningfully"*



Our Vision & Mission



- VISION

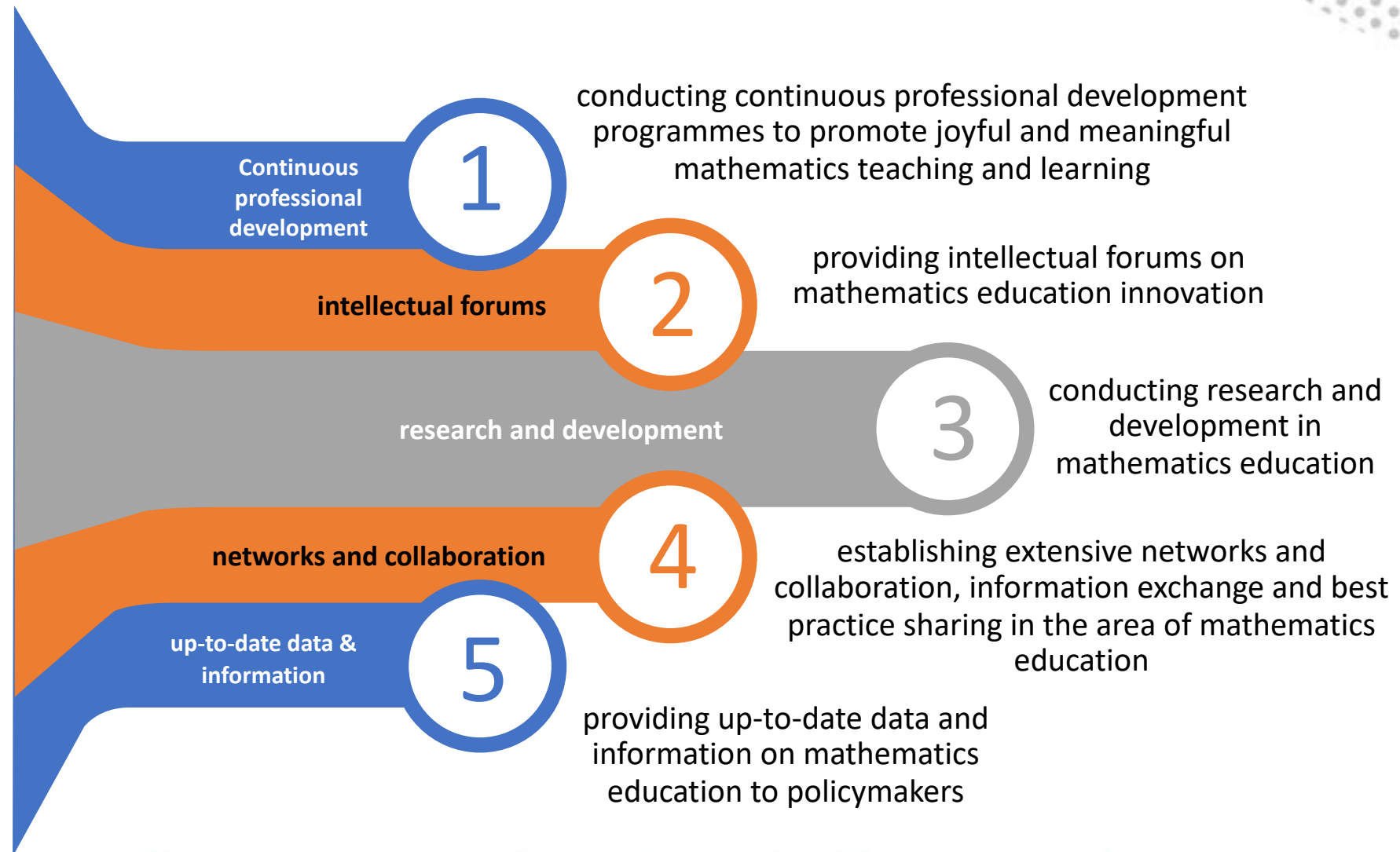
To be a centre of professional leadership in the area of mathematics education for teachers and education personnel within the framework of sustainability.

- 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



Programme Area of SEAQiM



1. Courses & Workshops

2. Seminars/Symposiums/Conference

3. Research and Development

4. Serial Publications

5. Community Service Programme

MATH FOR ALL



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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.

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

Why Studying Math?



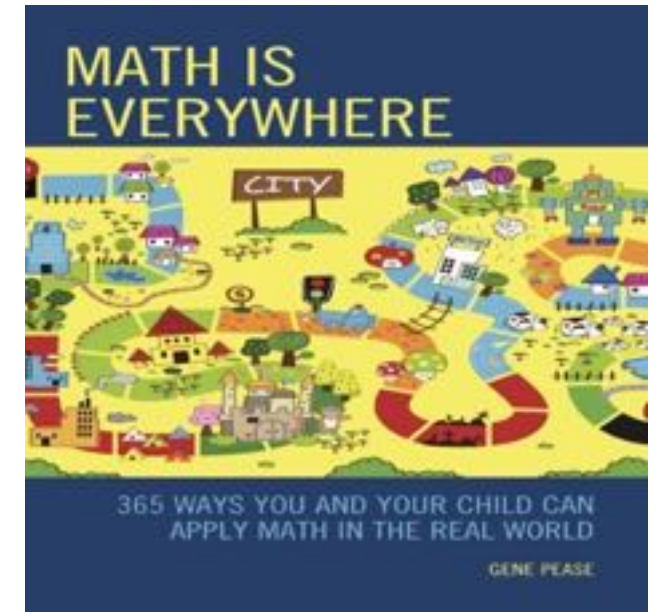
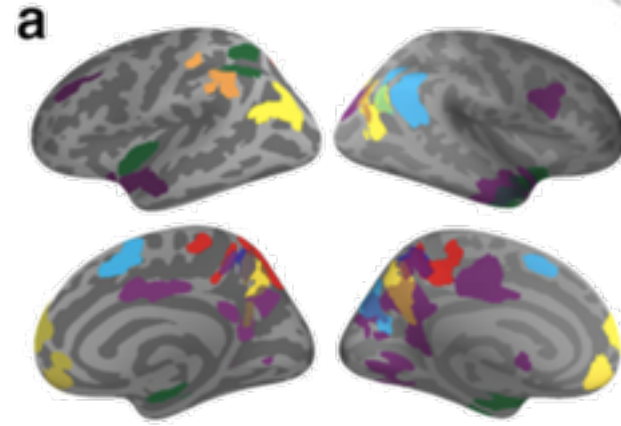
The illiterates of the 21st century will not be those who cannot read and write, but, rather those who cannot learn, unlearn and relearn. (Alvin Toffler).

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.



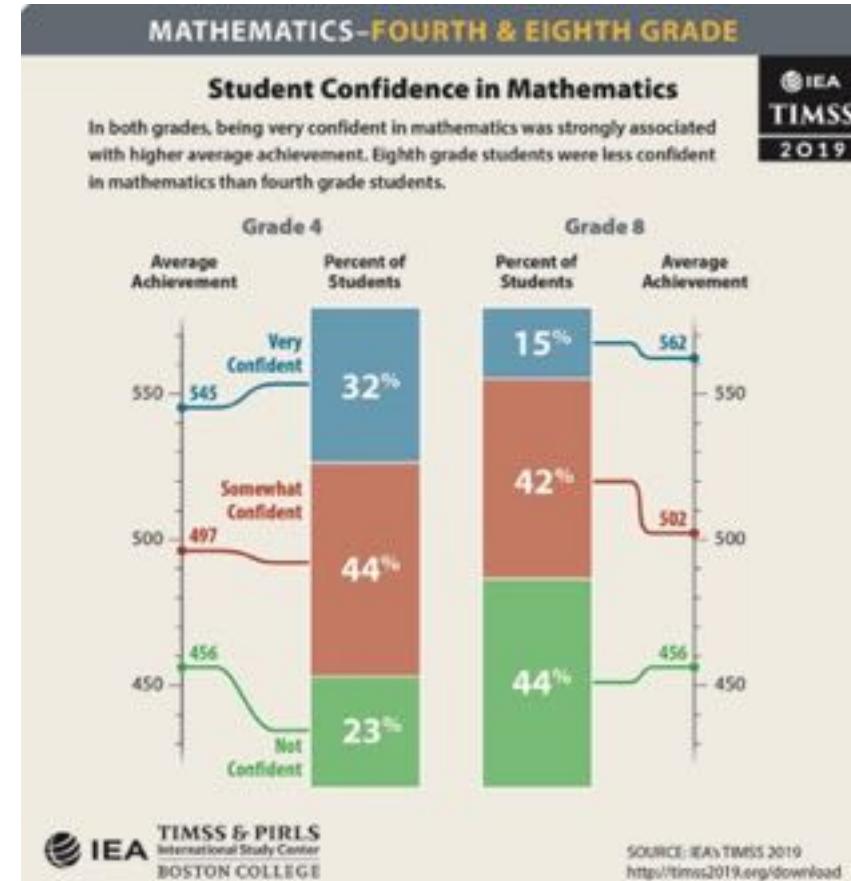
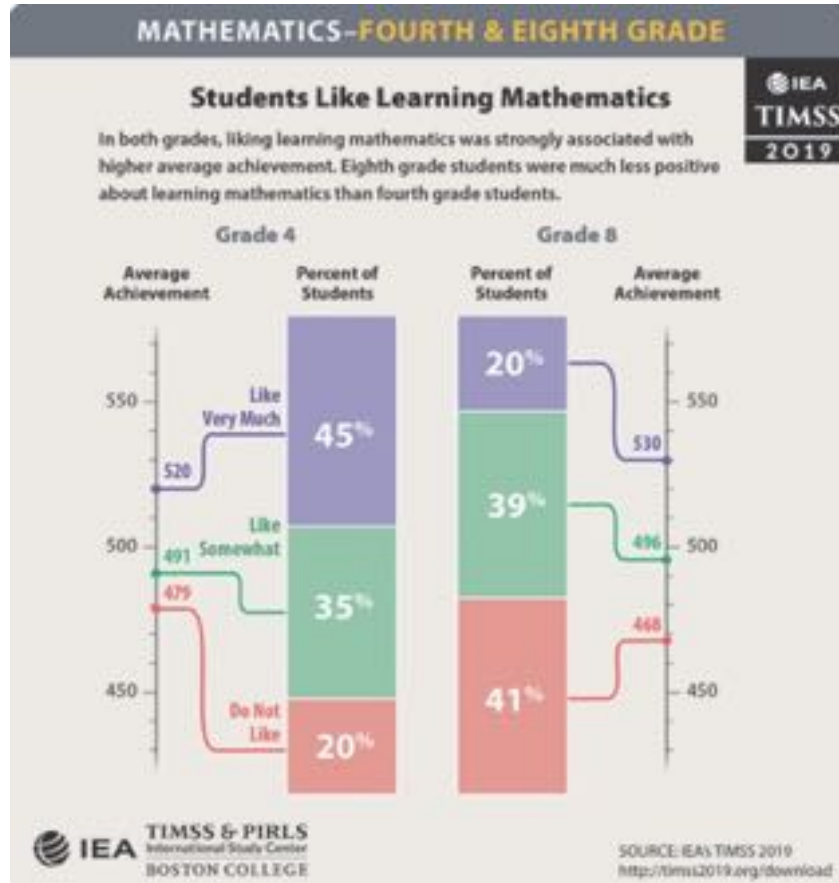
What Happen Today With Math Education



- 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



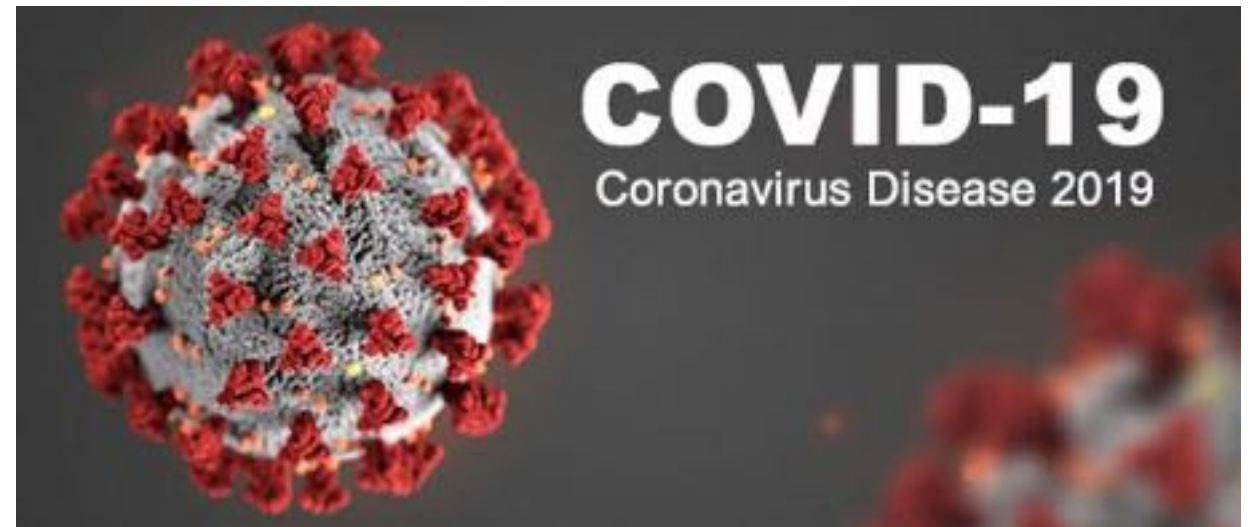
Math For All (MFA)



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

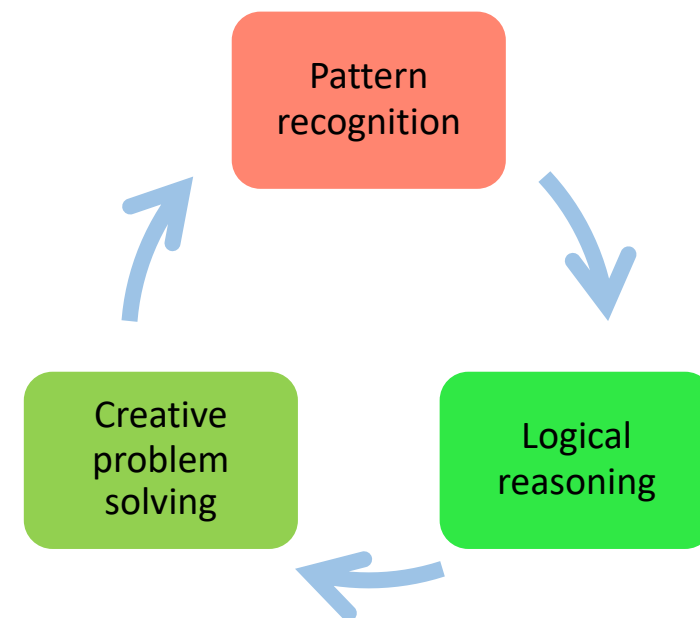
- Focus on essential concepts and procedures in mathematics.
- Use simple and daily-life context.
- Utilize problem posing from children.
- Consider local situation where children life.

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



STRATEGIC PROGRAM FOR TEACHERS



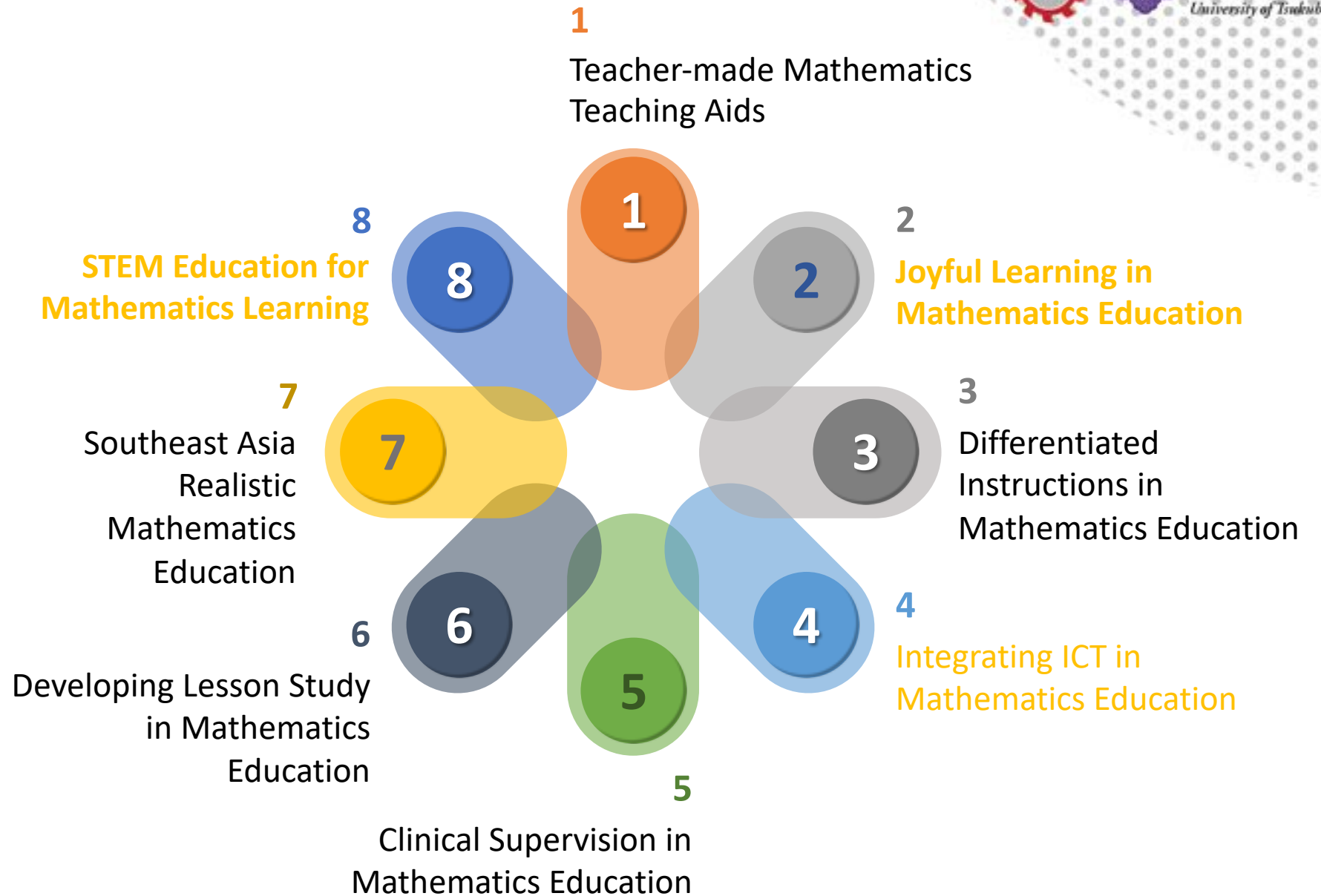
Our Strategy to Ensure MFA on Programme for Teacher



1	Choosing a suitable regular program during a pandemic
2	Developing the suitable programs during a pandemic
3	Adjusting program implementation during a pandemic
4	Strengthening literacy & numeracy in every program
5	Focus on thinking skills related to 21st century skills
6	Provide appropriate assignments for teachers in our program
7	Simple and easy to access for resources in course

COURSES

Focus on
STEM, Joyful
Learning and
ICT in Math
Education



Why STEM?



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?

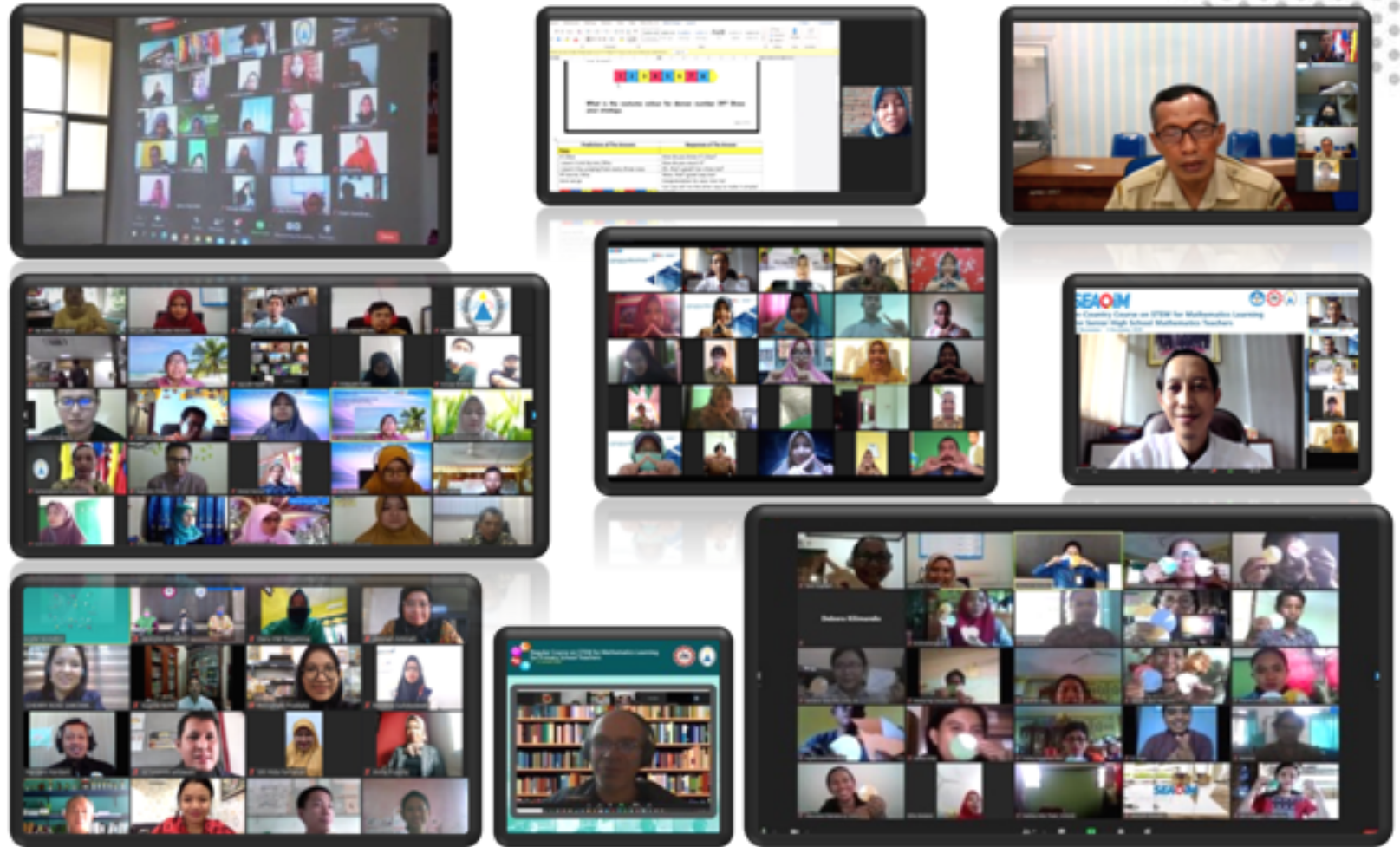
1. Shortened duration in zoom and also for theoretical exposure.
2. Project orientation with with clear mathematics goals.
3. Low-cost and easy construction material for STEM.
4. Using ICT in the learning process.
5. Daily-life context for STEM problem and activity.
6. Optimization chat room for discussion 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 on STEM

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

#STEM Camp

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 with clear mathematics goals.
3. Low-cost and easy construction material for STEM.
4. Daily-life context for problem and activity.
5. Activities carried out in small groups, according to health protocols.
6. Attempt to outdoor activities as well as to maintain health protocols.

FtF Courses & Workshops



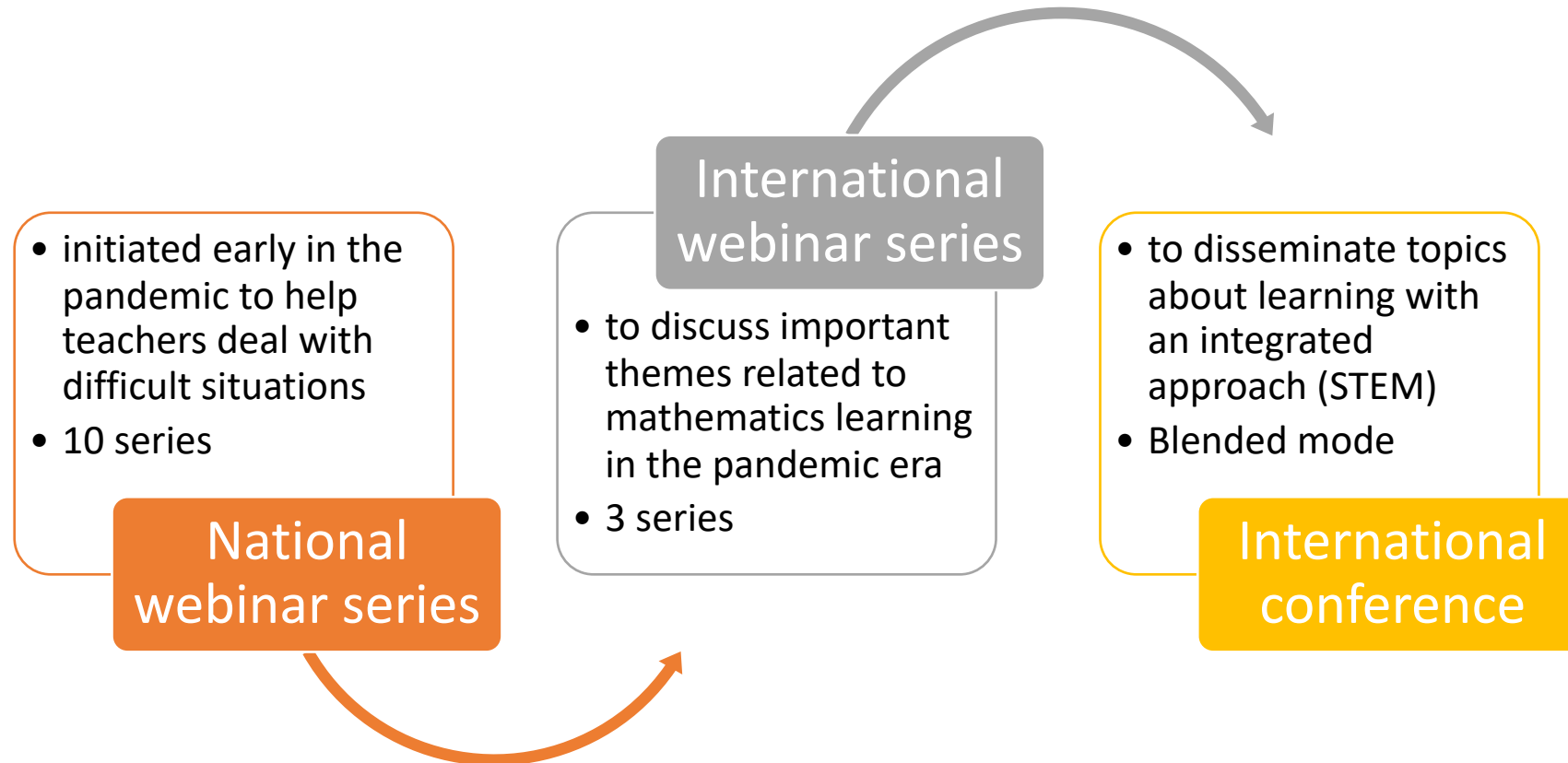
In-Country Course

#Workshop on STEM

#STEM Camp



Academic Forums



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.



International Webinar Series:
**Mathematics for All:
Mitigating the Impact of Covid-19 Pandemic**

Remarks by:

- Dr. Sumardiyono (Director of SEAMEO)
- Dr. Wahyudi (Deputy Director for Programme and Development of SEAMEO Secretariat)
- Prof. Ainsun Na'im (Secretary General of MDEC, Republic of Indonesia)

Moderator:

- Wahid Yudianto, M.Sc., M.A. (SEAMEO)

Keynote Speakers:

- Dr. Wan Hoor Adzamin (Binti Mohd Sabri) (UNESCO IICQM)
- Dr. Sri Wulandari (Dinosebata) (Universita Madani)
- Dr. Sumardiyono (SEAMEO)

Online via Zoom
Limited slots available!

YouTube Live Streaming
@beginmathematics

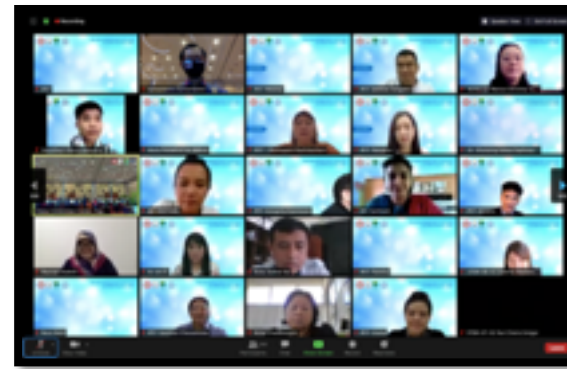
Benefit: E-certificates**, Giveaways

Monday, 14 December 2020
09.00 - 13.00 (GMT + 7) | FREE

Registration Link:
<https://bit.ly/RegistrationWebinarSeries3>

CP: Ms. Lily (+62 811 2577 072)

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

Congratulation! Mathematics Contest Winners Celebrating 11 Years of SEAQIM

<p>Photography</p> <p>1st Place (wins IDR 750.000) Carolin C. Kinnon (Dagupan National High School, Philippines)</p> <p>2nd Place (wins IDR 550.000) Charmalynne Dacier Aguirre (Philippine Science High School-Western Visayas Campus, Philippines)</p> <p>3rd Place (wins IDR 350.000) Heidi Nadia Ennami (TW Community Enablers, Philippines)</p>	<p>Video</p> <p>1st Place (wins IDR 1.500.000) Deniana Nabila (SD Xin Zhong, Surabaya, Indonesia)</p> <p>2nd Place (wins IDR 1.300.000) Ketut Sutarna (SMAN 1 Menggis, Bali, Indonesia)</p> <p>3rd Place (wins IDR 1.100.000) Mary Joy Buco Salas (Emigda A. Bendic High School, Philippines)</p>
<p>Poster</p> <p>1st Place (wins IDR 1.250.000) Ferasapina Kamarudin (SMK Dato' Abdul Haliman Yaakub, Malaysia)</p> <p>2nd Place (wins IDR 1.050.000) I Kadik Sembah Semachantha (SMKN Bali Mandara, Bali, Indonesia)</p> <p>3rd Place (wins IDR 850.000) Rizki (SDN Sidotopo (4R), Surabaya, Indonesia)</p>	<p>Digital Learning Media</p> <p>1st Place (wins IDR 2.000.000) Aria Wilman (SPTD SMPN 5 Batu Ampar, South Kalimantan, Indonesia)</p> <p>2nd Place (wins IDR 1.800.000) Tevan Adi Setiia (SMP Kristen YSR, Semarang, Indonesia)</p> <p>3rd Place (wins IDR 1.600.000) Firmanayah (SD Islam Terpadu Al Fuzon, Palembang, Indonesia)</p>
<p>Article</p> <p>1st Place (wins IDR 1.500.000) Dila Sabika Negara (SMP IT Al-Raihan, Bandar Lampung, Indonesia)</p> <p>2nd Place (wins IDR 1.300.000) I Made Yudi Candia Negara (SDN 1 Yehewibang Kangin, Bali, Indonesia)</p> <p>3rd Place (wins IDR 1.100.000) Akbar Dakha Prabowo (SMAN 1 Sragen, Indonesia)</p>	<p>*The prizes are NET tax free.</p> <p>*For more information, committee will contact the winners soon.</p>

Join Us!
TIME TO TAKE ON A NEW CHALLENGE.

SEAMEO QITEP in MATHEMATICS CONTENTS COMPETITION 2020

GeoGebra Innovative Contents for Pandemic Situation

Facility:
Certificate, Free Workshop

Total Prize: IDR. 120.000.000

Content Category:
Grade VII, VIII, IX, X, XI, XII @0 winners

Submission: bit.ly/QI20Konan

DEADLINE: 10 December 2020

Criteria:
Creative, Innovative, Interactive, Mobile Friendly

Contact Person:
Hanita; 08112844926

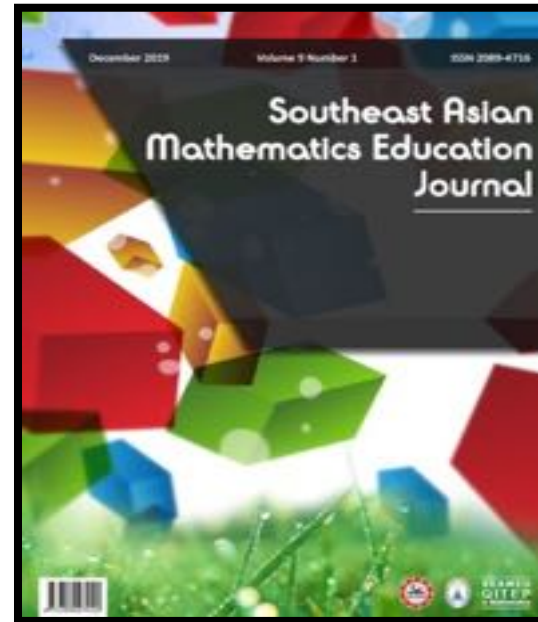
- a competition for math teachers related to best practices during the pandemic and creativity in creating digital content.
- to support teachers' efforts to endure meaningful learning during the pandemic.

Another response:

#Publication

SEAMEJ Journal

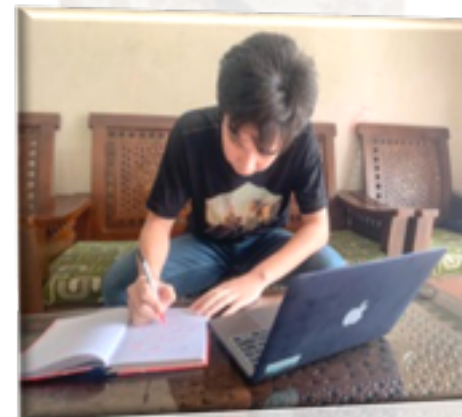
SEAMETRICAL Bulletin



- 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

Another response:

#Research



MaRWA Online

- From Indonesia, Malaysia, and Philippine.
- It has been implemented for 10 schools (227 students of grade 5), 10 schools (199 students of grade 8), and 7 schools (527 students of grade 10)

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)



