The 37th HRDWG-EDNET Meeting

Brief on Inclusive Mathematics for Sustainability in a Digital Economy (InMside)
(Japan, Chile, Thailand)

Agenda item: 6

Feb 2020, Malaysia

Advancing Free Trade for Asia-Pacific **Prosperity**

Objectives and relevance

Project Title
- **Inclusive Mathematics for Sustainability in a Digital Economy (InMside)**

Objectives
- To support the every economy's qualified curriculum by the training of curriculum specialists in every economy and recommendations for high school curriculum on mathematics, statistics and informatics. Focusing on senior secondary school.
- To train curriculum specialists in every economy to be able to lead the reform and to establish their network

Relevance
- **Mission of HRDWG**
  Develop 21th Century Knowledge and skills For All
- **Priorities of Chile**
  1) Digital Society
  2) Integration 4.0
  3) Sustainable Growth
  4) Women and Inclusive Growth

Asia-Pacific
Economic Cooperation

APEC 2019
Digital Society, Sustainable Growth, Integration 4.0, and Inclusive Growth

- **Smart thinking** rather than lots of knowledge

By Hee Chan Lew, President of KNUE, Korea

APEC Asia-Pacific Economic Cooperation

In the new world, it is not the big fish which eats the small fish, it's the fast fish which eats the slow fish

Klaus Schwab
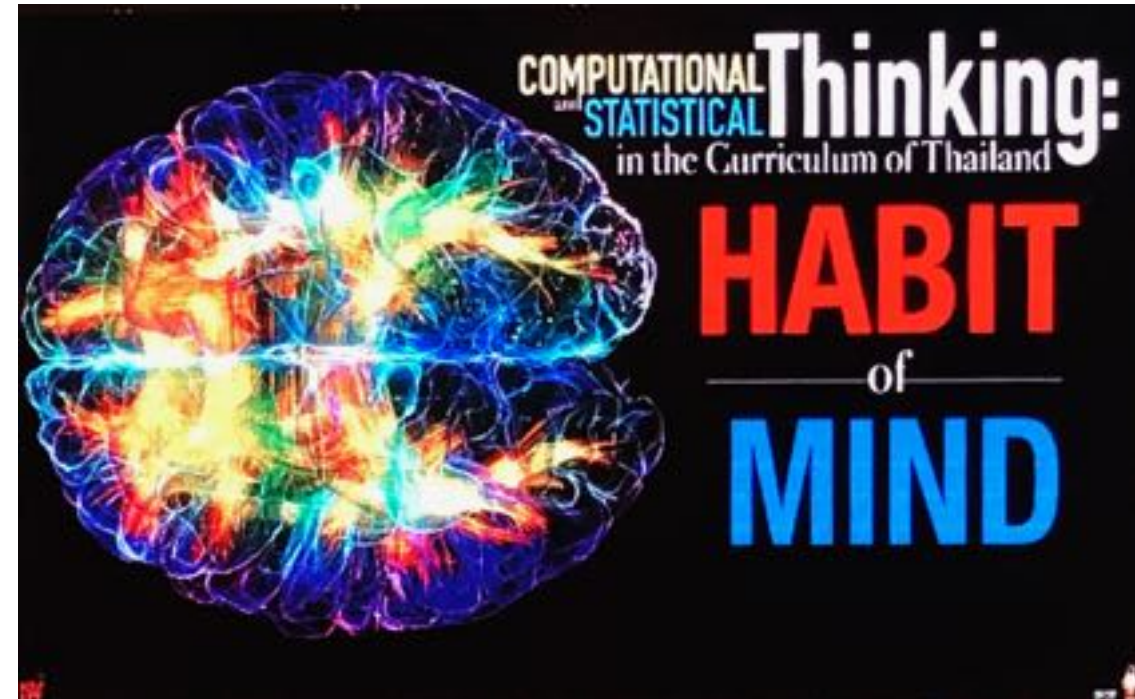Founder and Executive Chairman
World Economic Forum

Demands and Target

Demands of EDNET for 2030

➢Modernizing Education Systems

➢Promotion of Science, Technology and Innovation in Education and pedagogical practice

➢Development of 21st century competencies for work and entrepreneurship

Target of InMside (**2019(I): Senior Secondary**, 2020(II): Junior Secondary, 2021(III): Primary)

➢Training the curriculum specialists on Informatics and Statistics for their necessary curricula reforms on these demands.

➢Developing Recommendation to APEC for their Curricula reforms

➢Establishment of Curriculum Specialists Network

APEC Asia-Pacific Economic Cooperation

Project Cycle（1）

Training Seminar
By using **APEC and Self funds**

Chile

Draft of
Discussion Documents

Assignments

Draft of
Recommendations
for Your
Reform

Exemplar

**Research
(Steering)
Meeting**
Self-funds
Japan

**Synthesis
Meeting**

Self-funds
Thailand

Report to APEC
EDNET

Establishment of Trends

Report to Your
Economy
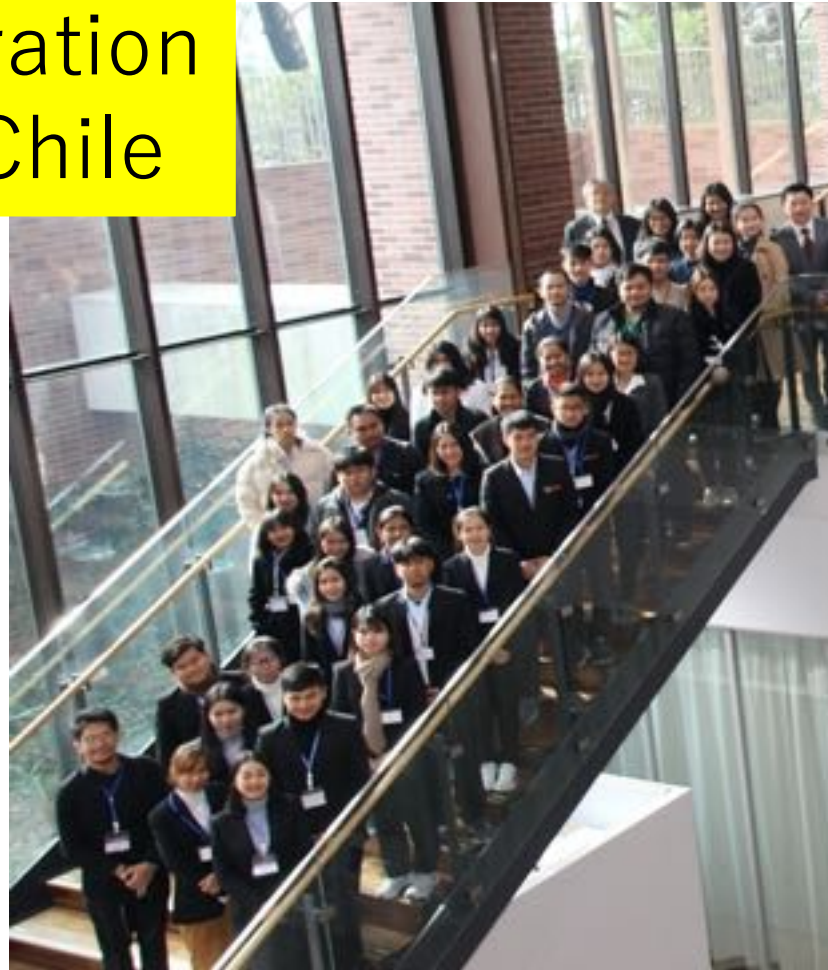
Recommend
ations to
APEC
EDNET

Establishment of Movements

Recommenda
tions to Your
Economy

Curriculum Specialists Network

Asia-Pacific
Economic Cooperation

Steering Meeting, Feb. 7-9, Tokyo
26 Researchers + 100 Participants

As for Preparation Meeting for Chile

Produced Discussion Documents for Computational and Statistical Thinking

APEC Asia-Pacific Economic Cooperation

APEC Seminar on Computational Thinking Curriculum for the Digital Economy, May 2-4, 2019, Vina Del Mar

Local Event: Lesson Study to develop computational and statistical thinking (Chile National Parliament at Valparaiso: 32 APEC participants + 400 teachers)

14th APEC Khon Kaen International Conference: 18-29, Nov. 2019

Robot Programing

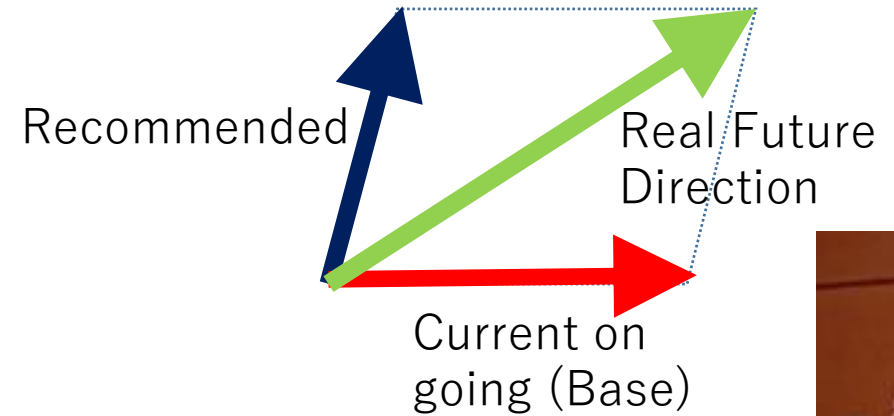- Develop Computational Thinking with using Computer and Robot

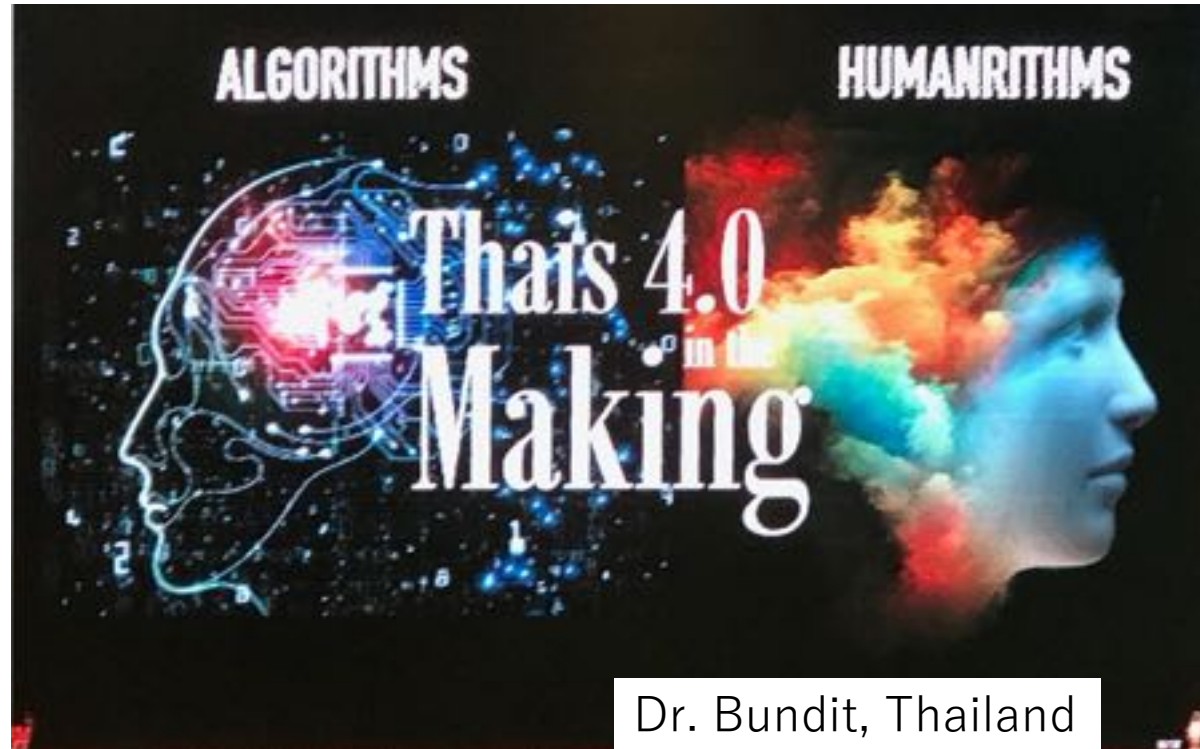# Computational Thinking can be develop every classroom without computer

Products: Recommendations in short

General:

- ➢ Recommendation provides the new direction, however it is based on current on going efforts and functions for establishment of real future direction by APEC economies' efforts
- ➢ AI and Humanity, both are necessary to develop as for new literacy
  - ➢ Variety of Challenges for Computational and Statistical Thinking

Recommended   Real Future Direction

Current on going (Base)

ALGORITHMS   HUMANRITHMS

Thais 4.0 in the Making

Dr. Mena, Chile

Distribution informatics content

Dr. Lambus, Indonesia

Asia-Pacific Economic Cooperation

Dr. Bundit, Thailand

APEC Meeting on Computational Thinking Curriculum for the Digital Economy:
Synthesis Meeting for Recommendation. November 18-20. 2019 Thailand

DRAFT
RECOMMENDATIONS

CURRICULUM REFORM FRAMEWORK

In order to materialized the new curriculum underlying the above said entities, a **Curriculum Reform Framework** model has to be established for the curriculum development process. This model will become the reference **implementation framework model** in carrying out the design process of curriculum formulation and implementation of the new curriculum proposed in each APEC member economies for high school, middle school and primary school respectively.

The propose curriculum reform framework is based on the following implementation framework model.

The framework is divided into two main layers which are the conceptual framework and development framework. The first layer is the conceptual framework which defines the important aspects to be addressed in the new curriculum based on the key elements underlined whether it becomes a subject-based curriculum, thematic, interdisciplinary or embedded across curricula. While it is also important for economies to decide on whether to adopt Standard-based Curriculum or Outcome-based Curriculum or Competency-based Curriculum.

CURRICULUM REFORM FRAMEWORK MODEL
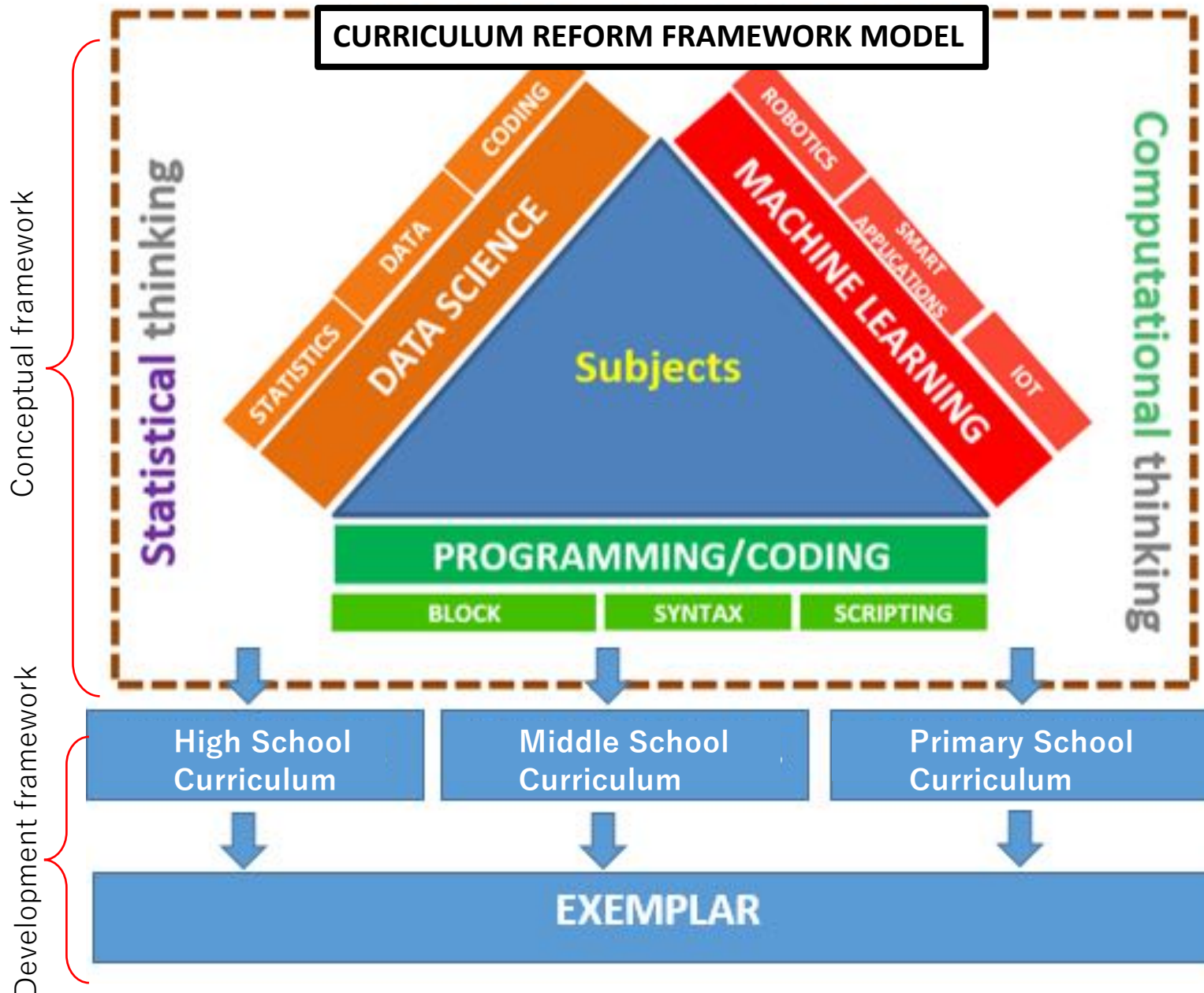
Products: Recommendations in short

For Senior Secondary School:

Development of Computational Thinking by
- ➢Introducing AI and Machine Learning such as Scatter Graph with Liner Discriminator (Bridge to Statistics)
- ➢Non-Visual Programing Languages

Development of Statistical Thinking by
- ➢Introducing Data Science with the nature of big data and culitique from the perspective of statistics.
- ➢Questions to Data and Data to Questions

Produce Exemplar to be experienced for leaning the ways of thinking.

Asia-Pacific Economic Cooperation

Necessity of Big Data for Educational Use

By Wang Xin Deputy Director NIES, China

Educational Big Data Research in China

Educational big data research in China focuses on teachers rather than students.

- President Jinping Xi attaches great importance to big data research.

- President Jinping Xi's elaboration on Big Data provide national educational reform with an entirely new mindset. Its leading role on curriculum teaching reform can be discussed from multi-aspects: mastering the Big Data, mastering the initiative of the reform; Internet plus education driving the development of curriculum teaching reform; applying the Big Data to improve the development of school curriculum system.

MICE alredy developed the database for Big Data for Education

By Ivan Vygotsky Russia

Let's collaborate!

Thank you very much!
Muchas Gracias
Terima kasih