



# APEC-UNESCO (MGIEP)- Tsukuba International Conference XII

## 12 years of Lesson Study (Jugyo Kenkyu) on APEC project network

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Director of CRICED, University of Tsukuba  
APEC Lesson Study Project Overseer



The project on going under the **LS community** in APEC

IMAGINE

## APEC Mathematics, Science & Emergency Preparedness

Australia:	NSW Department University of Melbourne	State project Local Project
Brunei:	Ministry of Education University of Brunei	National P. with MCI, Singapore Local Project
Canada:	N/A	
Chile:	CIAE, University of Chile Valparaiso C. University	National P. for curriculum dev. Local Project
China:	East China N. University North East China N. Uni.	Local Project
Hong Kong	HK Institute of Education	Local Project
Indonesia	SEAMEO Qitep in Math State Uni. of Yogyakarta	Regional Project Local Project
Japan:	MEXT University of Tsukuba	National Project
Korea:	Korean National Uni. of Edu.	
Malaysia:	SEAMEO RECSAM University Science Malaysia	Regional Project National & Local Project
Mexico:	Secretario Educacion Publica Pedagogical Uni. of Mexico	National Project
New Zealand	N/A	
Papua New Guinea	PNG Education Institution	National Project
Peru	Ministry of Education	National Project
Philippines	UP-NISMED	Local Project / National Project
Russia	MIOO	Local Project
Singapore	National Institute of Edu. R.	Local Project (National Project)
Chinese Taipei	Ministry of Education	(Local Project)
Thailand	Ministry of Education Khon Kaen University	National Project Local Project
USA	Mills College	Local & National Project
Viet Nam	Hue University	Local Project

Central Fund: APECLS Projects  
Self Fund: Growing LS Community  
in every economy

Education: Lesson Study  
Network Working Cycle

**Planning Meeting**  
February, Japan



APEC  
HRDWG  
Wiki Site

VTRs  
e-Textbooks

**Report Meeting**  
September, Thailand

Influential to the Other Economies in Europe, Asia, Africa,  
Central & South America such as SEAMEO

- 20 economies:
- 11 Government Organizations
  - 16 Major Teacher Education Institutes

Thank you very  
much for all of  
your support on  
APEC and in  
economy

Each economy has been making its efforts under APEC LSPs. LSPs in each economy are done by its self fund for reporting their effort to the APEC LSPs. Each project in each economy is done by LS experts.



# CONTENT

Pre-history

APEC Lesson Study Project (since 2006):

Activities and Products of CRICED (since 2002)



# Pre-History



## Export of Japanese Style Education since 1980s



A U.S. teacher said, "Before Lesson Study, we had talked about multiple intelligences, constructivism and so on, but never talked about the contents of teaching. In the Lesson Study project, we began to talk about the subject matter, why we teach it, how we teach it and what students learn from the lesson"

A U.S. teacher said, "I developed the eyes (teacher's perspective) to look at students and subject matters "Kodomo wo miru me". Now, I am well aware of my responsibility for my lesson. In the lesson study with other teachers, I preferred the more challenging lessons such as with Open-ended problems. When I found that students can challenge such difficult problems, I recognized self-confidence in my lessons"



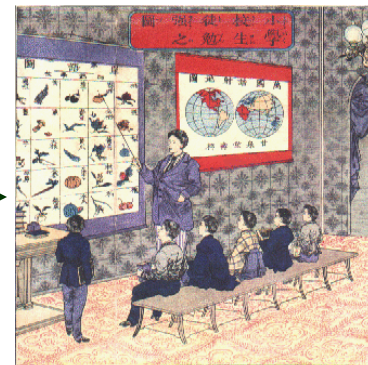


# An Origin in Meiji

## Tokyo Normal School and its Attached School

- Observing Lessons as a student;
  - Western teachers (around 1870) presented the lecture style for teaching scientific subject and students learned unknown teaching style at the same time as they learned subject matter.
- Pestalozzi Method;
  - Takamine, principal of TNS later, had studied the teaching method of Johann Heinrich Pestalozzi at NY in US and introduced the method to Japan through TNS.
- The Attached School teachers as system makers;
  - The attached school teachers adapted the method, trained other school teachers and published the teaching method book.

In the first teaching methods textbook (1883) for normal schools in Japan, written by the attached elementary school teachers in TNS, the way of critically observing teaching practice and the obligation of critical comment was already described as one of most important teaching content at all of normal schools.



# Problem Posing Approach



Children devise with their own study questions and write them on small chalkboards in the school hallway.

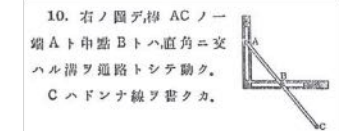
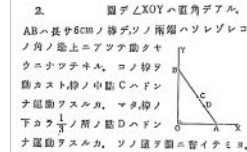
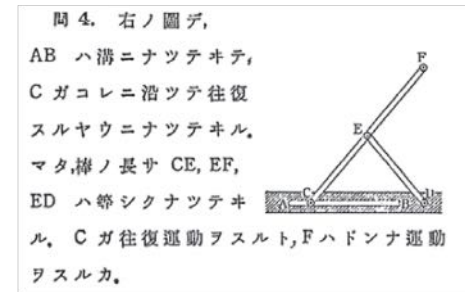
The boards are hung in the classroom to present the proposed ideas.



Figure 4: Study is conducted on how to teach students to develop their own study questions at the elementary school attached to Nara Women's higher normal school around 1920.



# Open Approach before WWII



犬・サル・キジノ三匹ガ歩イテ行クト、  
四ツ角ヘ出マシタ。三匹ハ、ソコデワ  
カレテ、別々ノ道ヲトツテ進ムコトニ  
ナリマシタ。  
道ノトリ方ハ、幾通りアルデセウ。







# Theme of APEC Projects

## see website

- 2006 Lesson Study
- 2007 Mathematical Thinking
- 2008 Representation and Communication
- 2009-10 Assessment and Subject Matter
- 2011 Textbook, e-Textbook and Software

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- 2012 Earthquake and Tsunami
- 2013 Flood and Typhoon
- 2014 Fire and Volcanic Eruption
- 2015 Future Prediction
- 2016 Energy Efficiency on STEM
- 2017 Energy Efficiency for Cross-Boarder Education

筑波大学・アジア太平洋経済協力(APEC)国際会議 APEC-TSUKUBA International Conference  
**授業研究による算数・数学教育の革新(Ⅲ)**  
**Innovation of Classroom Teaching and Learning through Lesson Study**

主催：筑波大学 共催：文部科学省、金沢大学、Khon Kaen University (タイ)  
後援：国際協力機構 (JICA)、日本数学教育学会、日本科学教育学会







ICM





ICM









筑波大学・アジア太平洋経済協力 (APEC) 国際会議 APEC - Tsukuba International Conference

# 授業研究による算数・数学教育の革新 (IV)

Innovation of Mathematics Teaching and Learning through Lesson Study IV



JAPAN 2010

主催：筑波大学 共催：文部科学省、Khon Kaen University (Thailand) 後援：国際協力機構 (JICA)、日本数学教育学会、日本科学教育学会





筑波大学・アジア太平洋経済協力 (APEC) 国際会議 APEC-TSUKUBA International Conference

# 授業研究による算数・数学教育の革新 (V)

Innovation of Mathematics Teaching and Learning through Lesson Study V

主催：筑波大学 (UT) 共催：文部科学省 (MEXT, Japan) コンケン大学 (KKU, Thailand) 後援：国際協力機構 (JICA) 日本数学教育学会 (JSME) 日本科学教育学会 (JSSE)







# 授業研究による算数数学教育の革新 VI

Innovation of Mathematics Education through Lesson Study VI

Challenges to Emergency Preparedness for Mathematics: Earthquake & Tsunami

主催：筑波大学 (UT) 共催：文部科学省 (MEXT, Japan), コンケン大学 (KKU)/Thailand 後援：国際協力機構 (JICA), 防災科学技術研究所 (NIED), 日本数学教育学会 (JSME), 日本科学教育学会





E12











# 2013



・ アジア太平洋経済協力 (APEC) 国際会議

APEC-TSUKUBA International Conference

140th Anniversary of lesson study

Innovation of Mathematics Teaching and Learning through Lesson Study (VII)

Organized by : University of Tsukuba

Co-organized by : Ministry of Education, Culture, Sports, Science and Technology, Khon Kaen University

Supported by: Japan International Cooperation Agency, Japan Society of Mathematical Education, Japan Society for Science Education







・ アジア太平洋経済協力 (APEC) 国際会議

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## Innovation of Mathematics Teaching and Learning through Lesson Study (VIII)

Organized by : University of Tsukuba

Co-organized by : Ministry of Education, Culture, Sports, Science and Technology, Khon Kaen University

Supported by: Japan International Cooperation Agency, Japan Society of Mathematical Education, Japan Society for Science Education







# アジア太平洋協力（APEC）国際会議 APEC-Tsukuba International Conference

Innovation of Mathematics Education through Lesson Study

Challenges to Energy Efficiency on STEM and Cross-border Education (X)

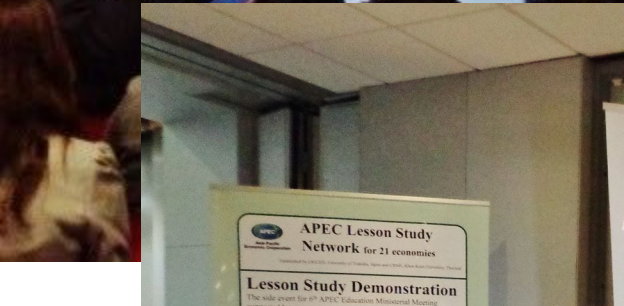
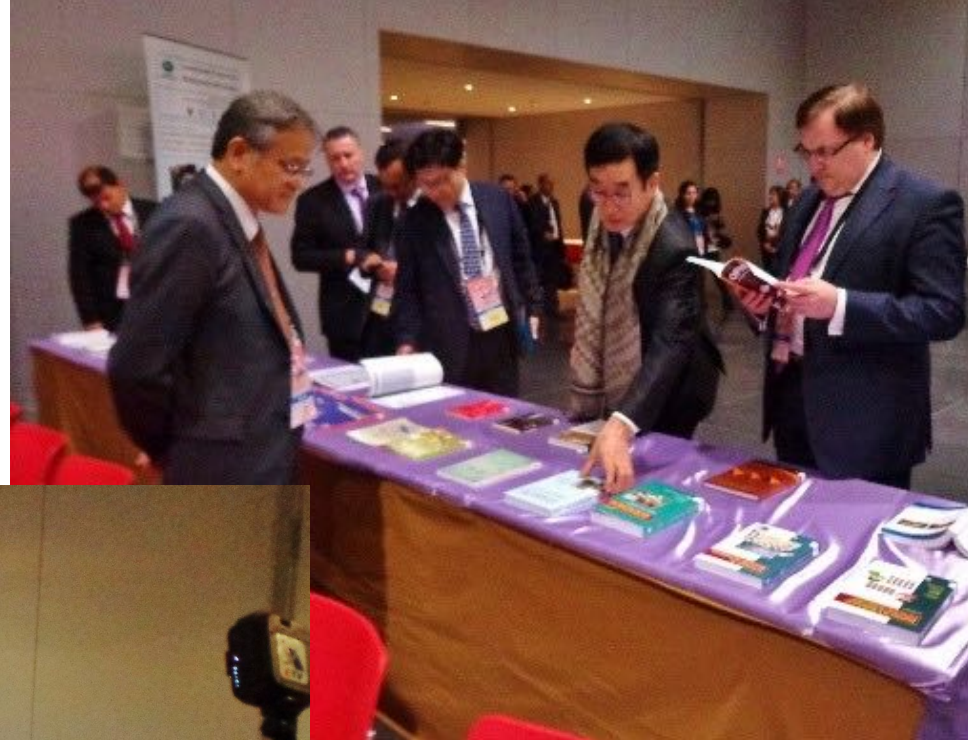
Organized by : University of tsukuba

Co-oranized by : Ministry of Education, Culture, Sports, Science and Technology, Khon Kean University

Supported by : Japan Society of Mathematical Education, Mathematicd Education Society in Japan





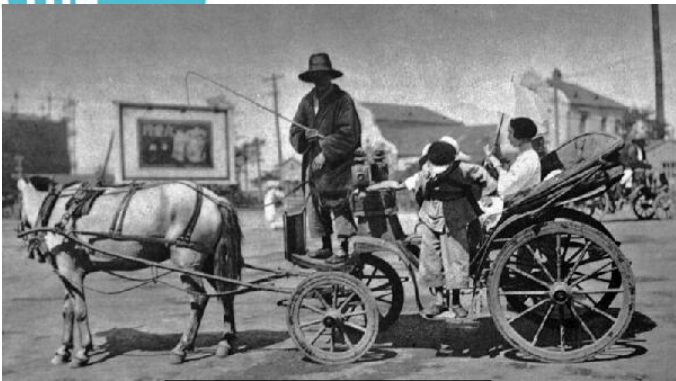






Why?

Create competency to imagine the Future with Mathematics!!



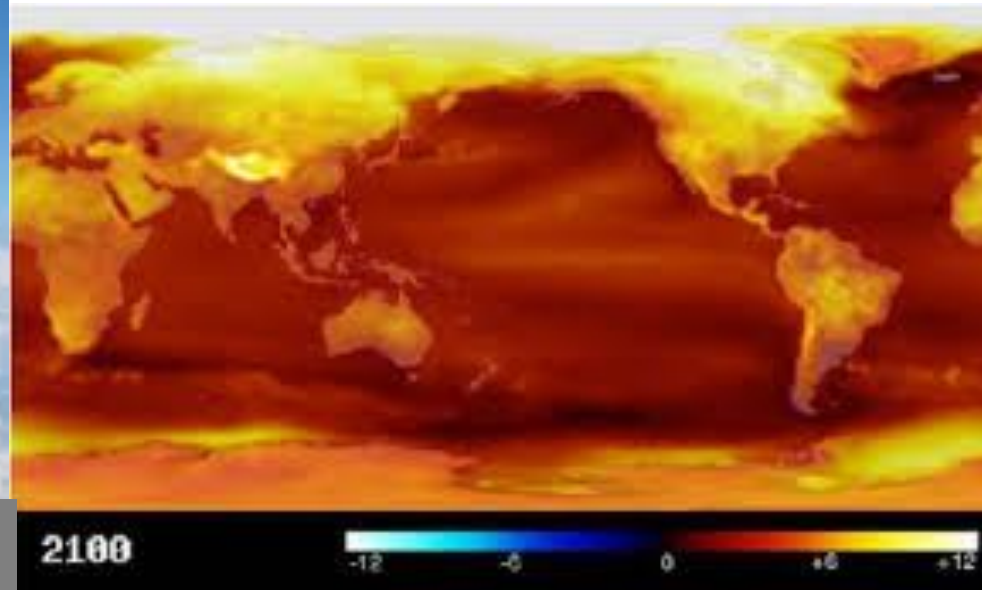
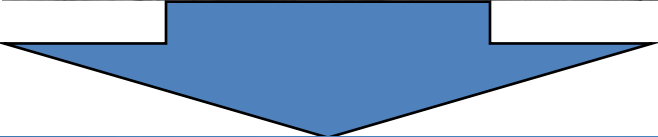
• 100 years ago, carriage/coach used to be a major transportation.

- Every where, there were stables for horse.
- There were places for souvenir from horses.

By Roberto Aray

– Now

– After 100 years



How can we dream and make the dream comes true?



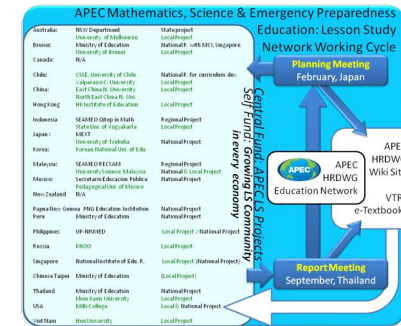
# The Power of Teacher Training Institutions

## Engaging in the teacher training program

RC-PM-138-2 MAKING REAL LIFE CONNECTIONS AND DEVELOPING  
MATHEMATICAL IDEAS IN PRIMARY CLASSROOMS  
(5-30 May 2014)



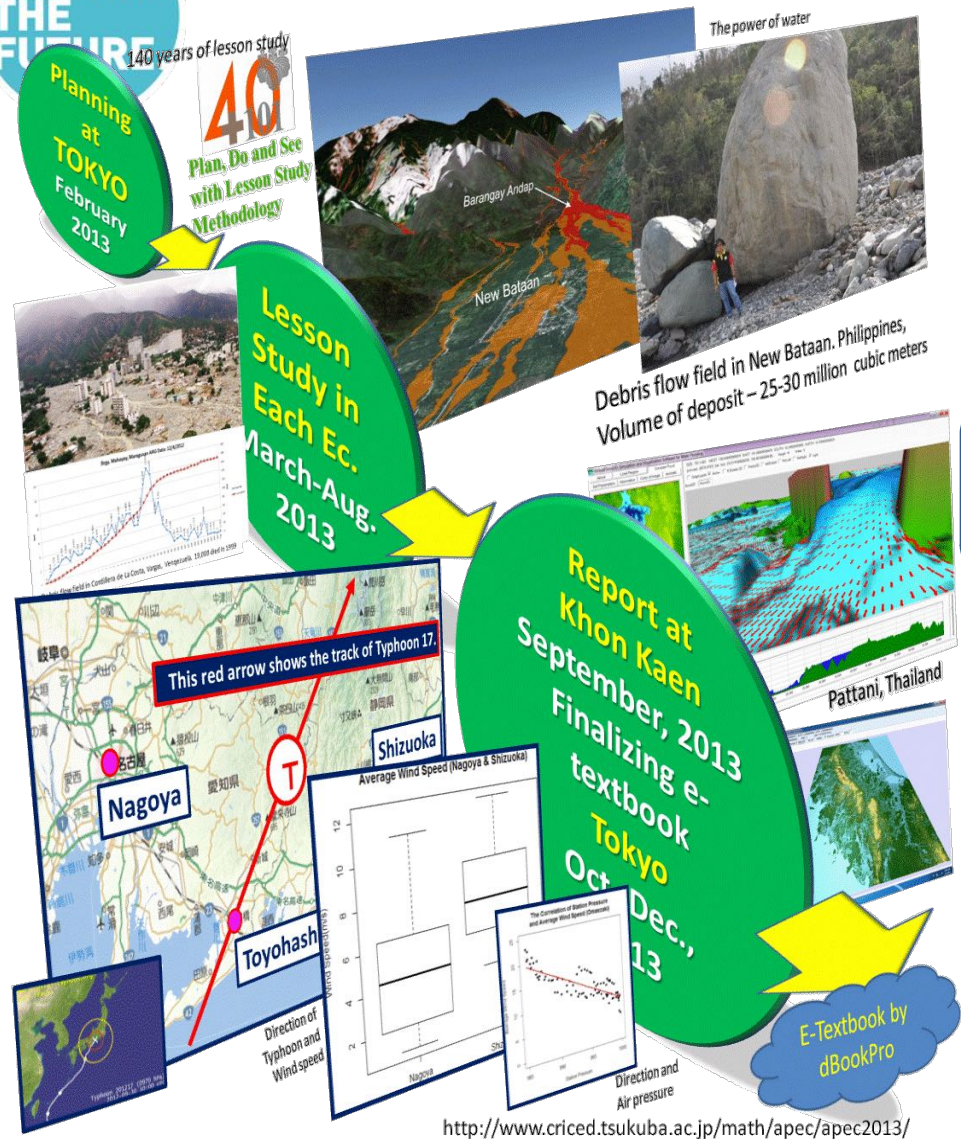
Every economy engage in teacher training program of lesson study on emergency preparedness.



*Influential to the Other Economies in Europe, Asia, Africa, Central & South America such as SEAMEO*

# PDCA (plan-do-check-act): Yearly Cycle

IMAGINE THE FUTURE



<http://www.criced.tsukuba.ac.jp/math/apec/apec2013/>

Every year:

- Planning at Tokyo by APEC fund
- Lesson study is done by self fund in each economy
- Reporting at Khon Kaen by APEC fund
- Actions are done by teacher training institutions.

Why we were supported by self-fund?

If APEC project leads us, our government might support us because it is the our issue which has the priority. Mathematics is the major literacy subject. Emergency preparedness education and science are necessary.



# How can we predict the Future?

*Based on the Current: Aimed for Improvement*

Based on the current status within **known variable** like most of Natural Scientist

*Future Creation: Aimed for Innovation:*

Based on the possible future through searching for **unknown variable** like Business Scientist

*With both approaches, **Produce***

**Plausible Scenario**

*Using mathematics:*

- Big Data: Statistics
- Probability Tree
- Delphi Method

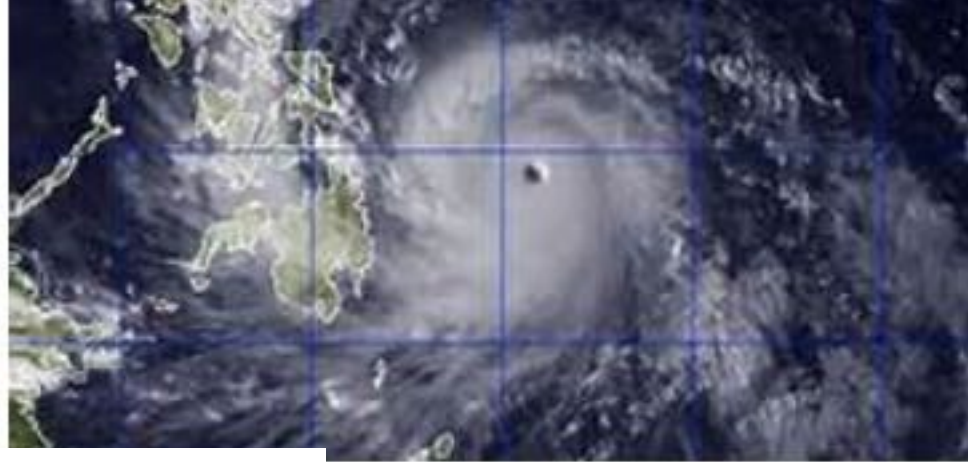
# The nature for this LS project

- Network of Teacher Training Institutions
- Continuity for Good Practice, Improvement and enlargement
- Challenges

Not only Thailand and Japan: Other economies are leading.

Show you the case of Indonesia based on Philippines and Peru





express mourning to the people who passed away including the **Philippines**, 6000, by the moon and flood beyond the project NOVA.





# Introduction

## NISMED's Journey in Adapting Lesson Study

Soledad A. Ulep & Risa L. Reyes

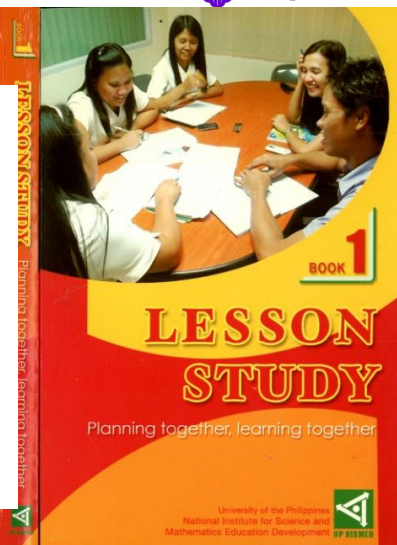
In 2006, the Philippines through NISMED participated in the Lesson Study Project of the Asia-Pacific Economic Cooperation (APEC) led by Tsukuba University (Japan) and Khon Kaen University (Thailand).

Lesson study is an effective means of introducing innovative practices in mathematics classroom teaching and learning. As such, it is a powerful way for developing a country's human resources that can ultimately contribute to its economic progress. The countries involved in the project are Australia, Brunei, Chile, China, Indonesia, Japan, Malaysia, Mexico, Peru, Philippines, Russia, Singapore, South Korea, South Africa, Chinese Taipei, Thailand, United States of America, and Vietnam. So APEC, an international economic organization, recognized that lesson study is important in a country's economic development.

Why did APEC recognize the value of lesson study? In the Third International Mathematics and Science Study (TIMSS) and in earlier administrations of international assessments similar to TIMSS, Japanese students consistently outranked their counterparts all over the world. This phenomenon was attributed to the school-based and teacher-led continuing professional development that their teachers engage in known as lesson study

An achievement in LSPs Network from the University of Philippines 2013, Oct.

[www.nismed.upd.edu.ph](http://www.nismed.upd.edu.ph)



Indonesia, Singapore and Brunei have been enhancing Lesson Study Nationally.

# The Case of Peru

## 3.1 Identification of risks and resources



## ACTIVITY Nº1. FOR 5º - 6º GRADE





# The Case of Peru:

Emergency  
Evacuation  
planning

Stream and  
affected  
population  
by  
mudslides

## TASK 1

Children,  
located on  
the map of  
the district,  
the  
approximate  
locations of  
the  
watersheds  
that  
originated  
Mudslides

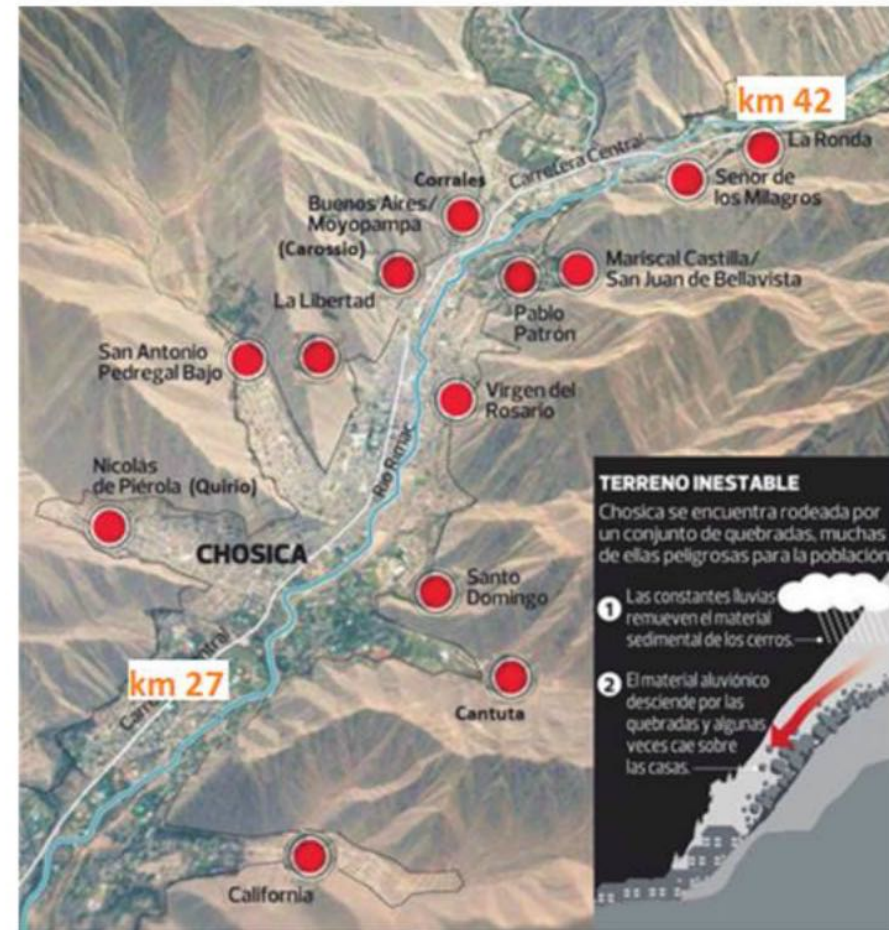
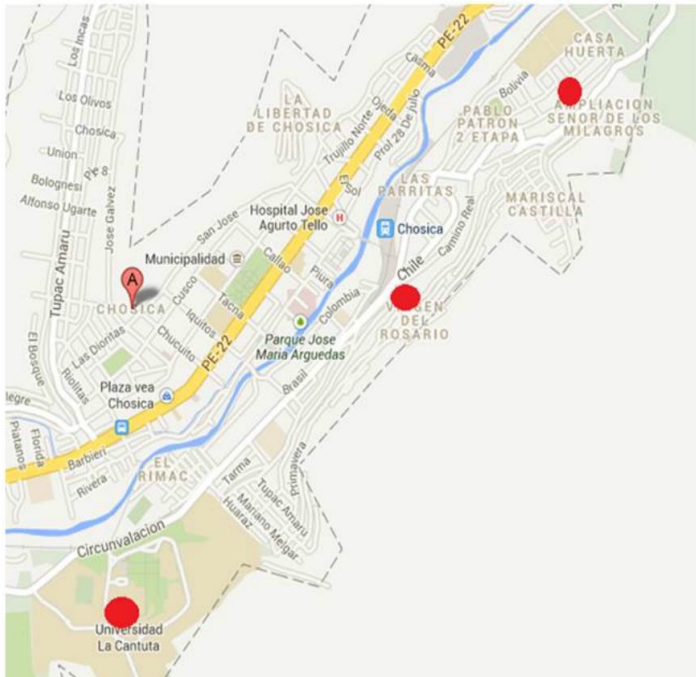


Figura N.º 7. Quebradas y población afectadas por los huaycos en Chosica  
(Adaptado de INDECI/Municipalidad de Chosica)





International  
Collaboration for  
Developing Materials:  
The Case of Indonesia

Let's Engage in  
New Challenges



# Mathematics for Future

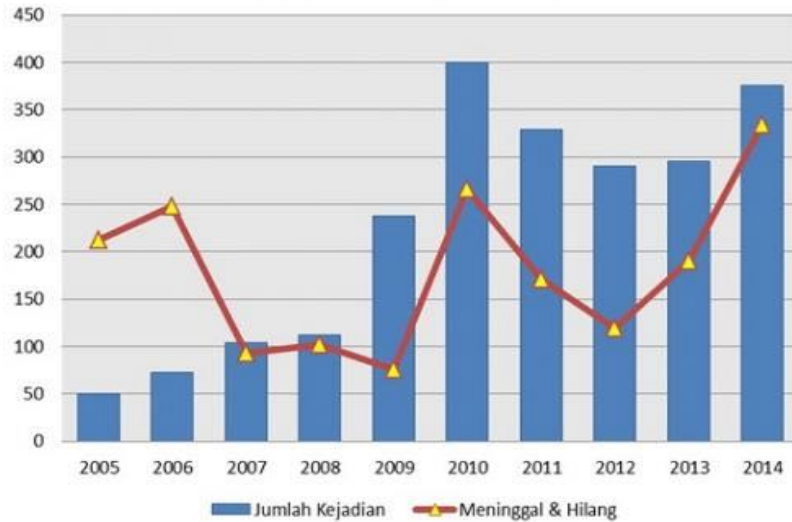
## Prediction:

### The case of **Landslide**

Wahyudi

SEAMEO Regional Centre for QITEP in Mathematics





- Landslides in Indonesia 2005 – 2014





# The Process

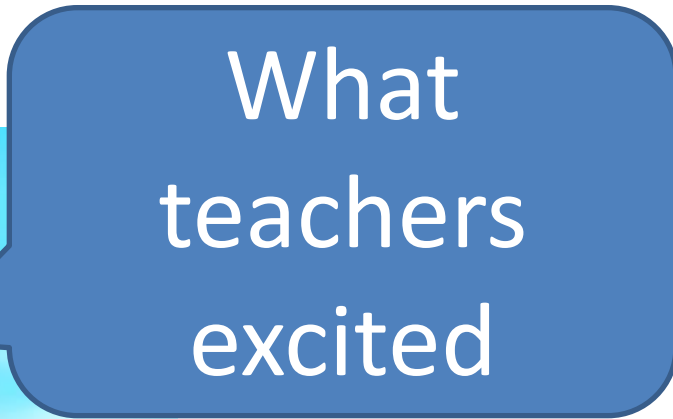


Inviting the teachers for the workshops – through LS  
Developing Lesson Plan focusing on real world problem  
namely Landslide


## Involving:-

- 1 Primary School
  - 2 Junior Secondary School
  - 1 Senior Secondary School
- 
- School visit for classroom observation
  - April – July 2015

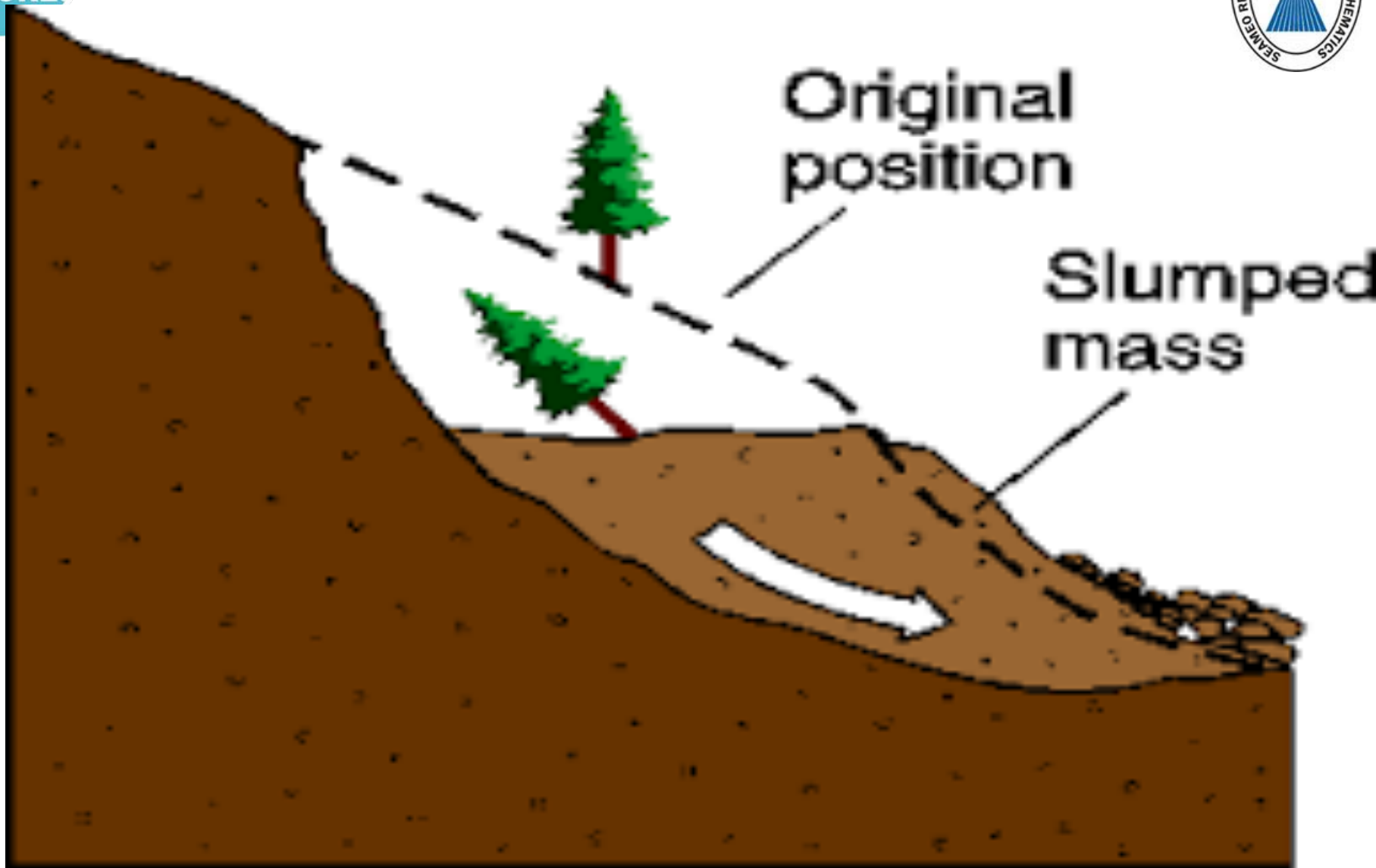




What  
teachers  
excited

- 
- For Planning:  
Preparation of teaching content  
Learn theory at first and then,  
develop tasks for students

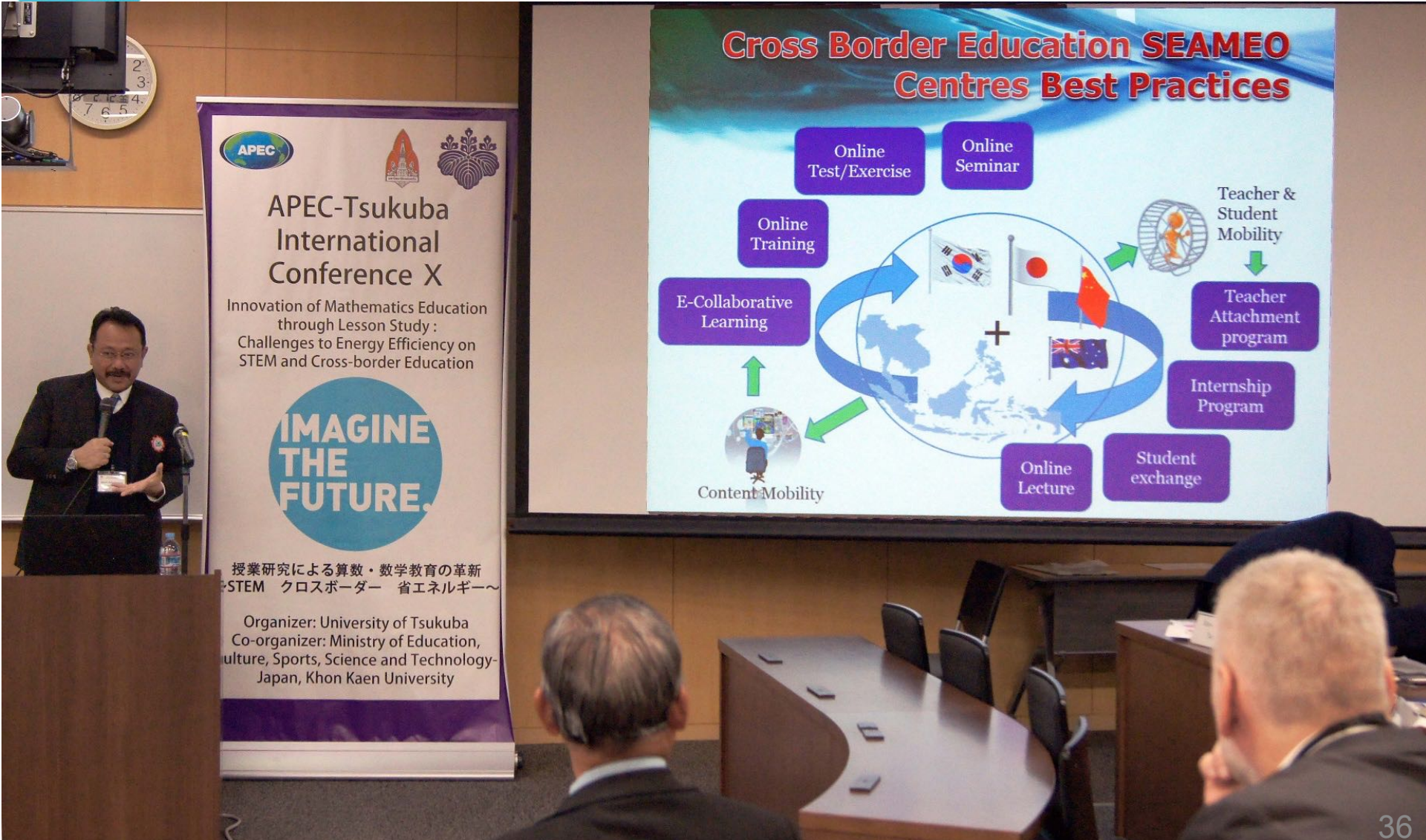
# For Finding the Objective for teaching







# The Case of ASEAN + 3 by Dr. Gatot, Director of SEAMEO Secretariat



APEC

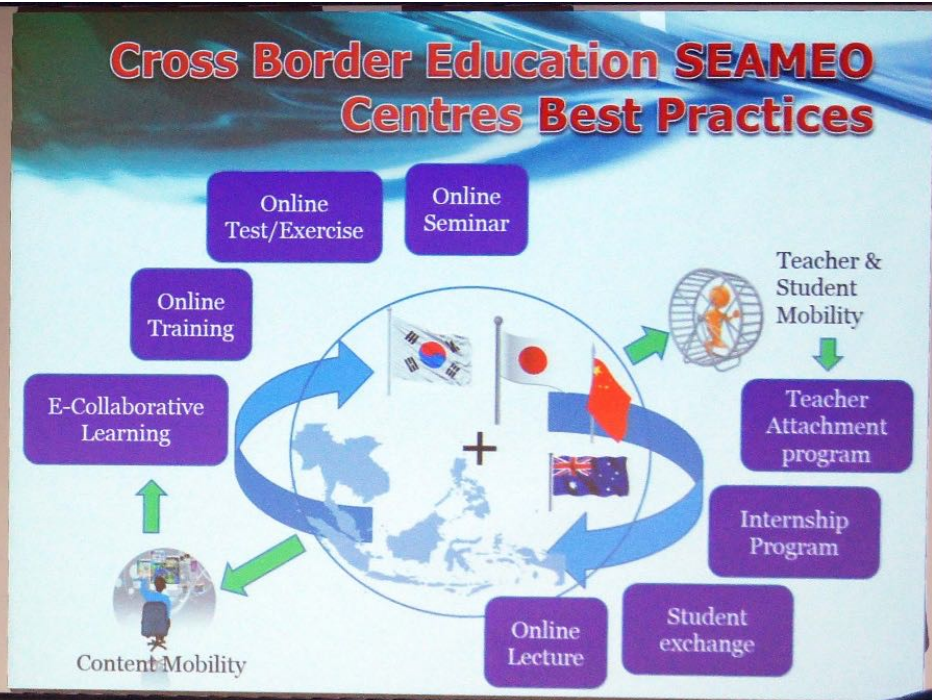
**APEC-Tsukuba  
International  
Conference X**

Innovation of Mathematics Education  
through Lesson Study :  
Challenges to Energy Efficiency on  
STEM and Cross-border Education

**IMAGINE  
THE  
FUTURE.**

授業研究による算数・数学教育の革新  
STEM クロスボーダー 省エネルギー～

Organizer: University of Tsukuba  
Co-organizer: Ministry of Education,  
Culture, Sports, Science and Technology-  
Japan, Khon Kaen University







# Lesson Study for the Task beyond the cross boarder

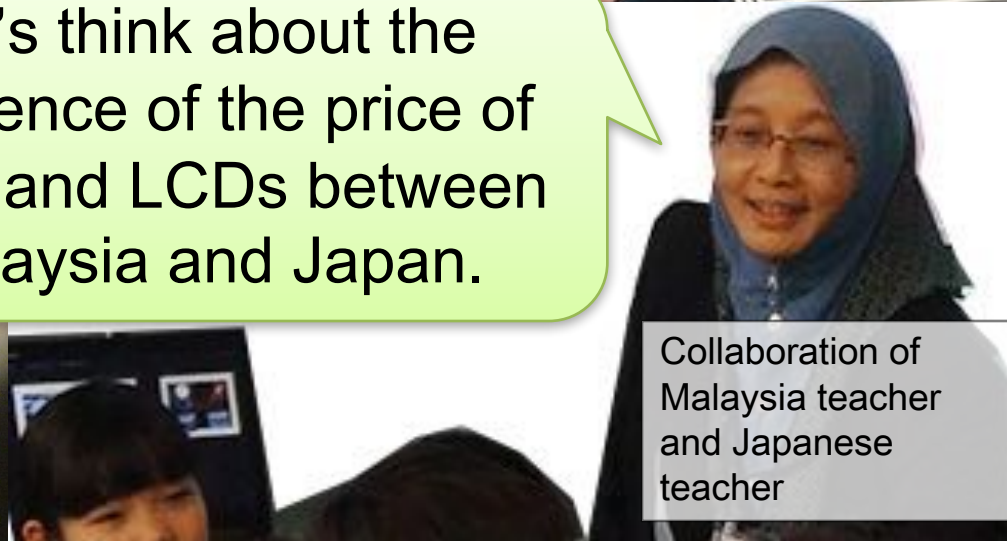
Malaysia



Japan



Let's think about the  
difference of the price of  
bulbs and LCDs between  
Malaysia and Japan.



Collaboration of  
Malaysia teacher  
and Japanese  
teacher





Presidents of the Universities also attend the session and learning from challenges





# A Sample for Cross-Boarder SEAMEO School Network

Dr. Gatot, Director  
of SEAMEO  
Secretariat







- Thank you very much for your contributions and collaborations