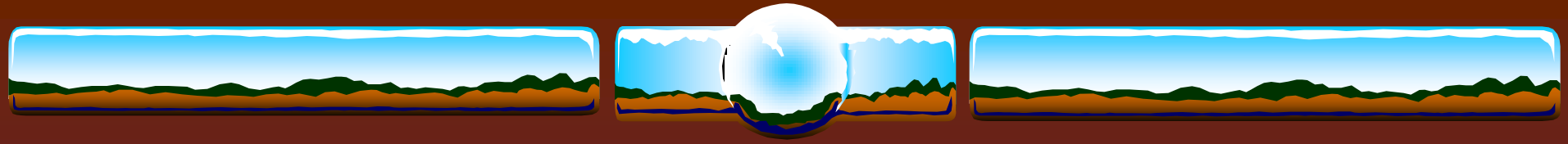
The Experience of SEAMEO QITEP in Mathematics Collaborates with 5+1 Mathematics Teachers on Energy Efficiency and Cross Border Education Project

SEAMEO QITEP In Mathematics

QiM: 2016 EnergyEff

PowerPoint Presented on ‘APEC-Khon Kaen International Symposium on Energy Efficiency, STEM and Cross Border Education’

Khon Kaen University, Thailand
Khon Kaen, 12-15 November 2016



Imagine the Future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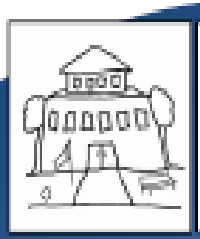


Sekolah kondusif
Tersedia, terjangkau, berkualitas, memiliki tata kelola yg baik.

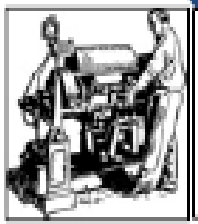
Orangtua peduli
Sadar pendidikan, aktif memberi stimulus, tekun mendampingi.

Guru penyemangat
Peduli pada murid, berkompeten, belajar berkelanjutan.

Warga peduli
Konsisten memantau, aktif berkontribusi.

Lulusan Mandiri dan Berkepribadian

Organisasi profesi suportif
Menyusun kurikulum khusus, menjadi narasumber.



Industri suportif
Menyusun kurikulum khusus, aktif berkontribusi.

Pemerintah suportif
Menyediakan akses dan jaminan, menyederhanakan birokrasi, memiliki tata kelola yang baik.

What kinds of:

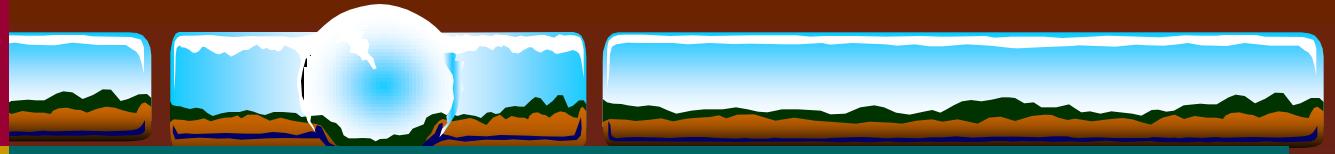
- ❑knowledge
- ❑skills
- ❑attitudes

Are **needed** by our students to survive in the **21st Century** and Beyond?

The APEC-Tsukuba International Conference X: Innovation of Mathematics Education through Lesson Study Challenges to Energy Efficiency on STEM and Cross-border Education (February 12-15, 2016) University of Tsukuba, Tokyo, Japan

Implemented in 5 + 1 Schools

Reflection



The Four Important Questions: "How to Help Our Students to Learn Mathematics:

1. meaningfully → easily?
2. joyfully?
3. to use their heads (think)?
4. to be an independent learner?"

Objective of Math Education

CRICED
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Human Character Formation

Attitude and Values: Beautifulness, Curiosity, Reasonableness, Appreciation

Skills for Learning: Learning How to Learn

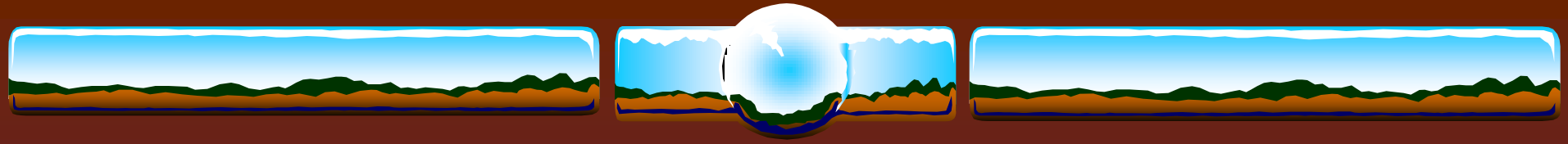
Mathematical Thinking: Extension, Generalization, Anticipation, Integration, Change the representation for explaining

Knowledge and Skills

Traditional way of calculation
New way of calculation
Pattern on the calculations

We should develop children who can use what they learned before with out our support. If they developed, they can reply the question what do you want to do next.

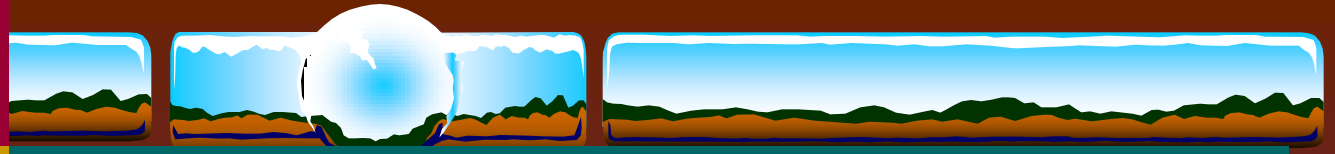
Source: Isoda (2015)



The PSA Steps

1. **Problem Posing**
2. **Independent Solving**
3. **Comparison and Discussion**
4. **Summary and Integration.**

Source: Masami Isoda (2011)



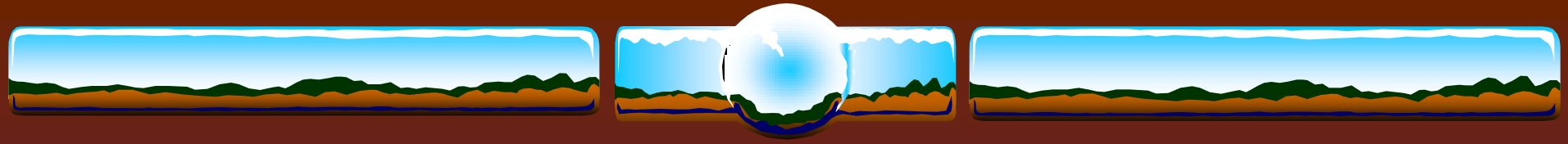
The Indonesian Scientific Approach:

1. Observing
2. Questioning
3. Collecting Data
4. Reasoning
5. Communicating

Procedures for EE

1. **SEAMEO QITEP in Mathematics announced the 'Energy Efficiency Project'.**
2. **Invite the Classroom and Mathematics teacher to participate on the project by sending the Lesson Plan regarding energy efficiency.**
3. **Selected 5 of those Lesson Plans.**
4. **Worked together among 5 chosen teacher and QiM specialists (included Peer Teaching).**
5. **Implemented in real Classroom.**
6. **Reflection phase.**
7. **Conducted seminars**
8. **Writing Report.**

Procedures and Implementation of Cross Border Education (Thailand – Indonesia) will be Reported by Dr Thanya Kadroon.



The 5 Teachers

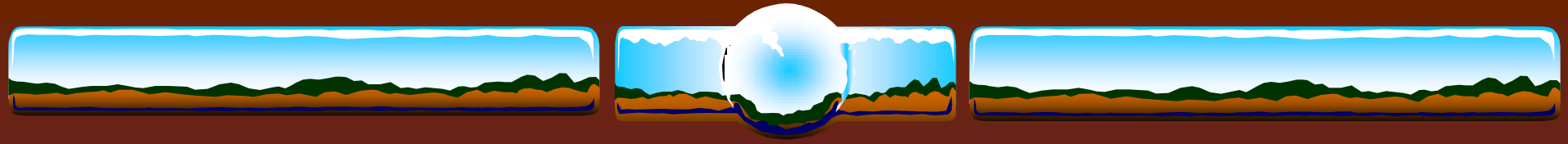
1. Mr Kawit: SDIT Assalaam Sanden: Wind Power + Ratio
2. Ms Fia: SDN Deressan: Hydro Power + The Area of D2
3. Mr Rifai: SMPN 3 BangunTP: Water Efficiency + Volume on D3
4. Ms Ika: SMKN 2 Wonosari: Electricity Efficiency + Statistics
5. Mr Istiqlal: SMAN 2 Jokja: Solar Cell + The Angle between 2 Sides on D3.
6. Mr Darto: SMPN 4 Pakem; Cross Border Education with the School in Thailand.

Results

- VIDEO

Reflections

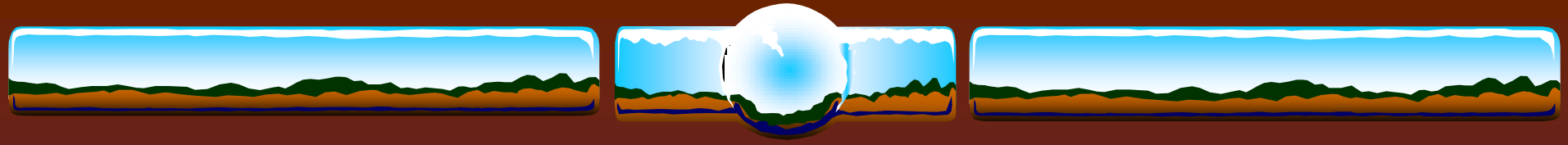
- The importance for our students to achieve 3 aspects of the objectives of learning and teaching of math.
- It is not easy to change the behavior of teachers.
- The importance of the first step of PSA.
- The PSA and SA can be implemented in harmony.
- The importance of the use of LS (Plan, Do and See).
- No Lesson Design is perfect → The openness of LD to be improved.
- The importance of teacher to help learners.
- Challenge >< Easier and more interesting for students.



The Importance of the Japanese PSA & Indonesian SA (1)

1. Problem Posing
2. Independent Solving (FS: SA)
3. Comparison and Discussion (FS: SA)
4. Summary and Integration.

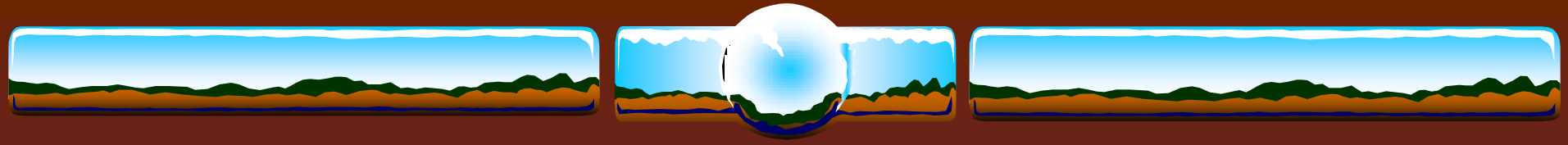
Source: Masami Isoda (2011)



With **PSA and SA**, our students can learn these Attitudes (FS):

1. The beauty of mathematics
2. The curiosity → asking question by themselves
3. The reason of the correctness of the results
4. The appreciation in learning mathematics

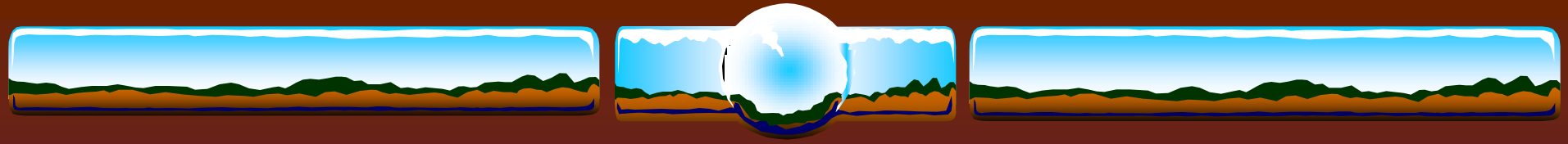
Source: Masami Isoda (2015)



These Activities (**PSA & SA**), Facilitate our Students to Learn:

1. Meaningfully
2. Joyfully
3. How to learn to think
4. How to be independent learners

Source: Shadiq (2016)



The End

Thank You

Very Much