Bridging the STEM skills gap that involves education and industrial commitments : **RECSAM's role and contributions** by **Taufek Bin Muhamad Acting Centre Director** SEAMEO RECSAM





The gap in education

- Lack of awareness
- Perceives science as very challenging
- Focusing more on content rather than practical
- Insufficient learning opportunities
- Science laboratories issues



STEM GAP

- We cannot be expected to turn the students around in the 3-4 years that the students are in the university
- We are at the receiving end of the students trained by schools. We cannot provide the STEM training piecemeal
- We need to review our STEM education framework





Cradle to career

- We need to start STEM education from primary to secondary to tertiary education
- In other words STEM education must be from cradle to career.
- It must be coupled with innovative and entrepreneurial thinking.
- It must be seamless
- With the launch of both blueprints MOE and MOHE are seriously starting STEM education from cradle to career
- We need to re-train the teachers and lecturers in the teaching of STEM

College/

High School

Elementary Sch

Age 5



DO WE HAVE THINKING SKILLS ON THE GROUND?

- Teaching students to become effective thinkers become the immediate goal for education in Malaysia.
- Our curriculum now emphasizes on HOTS, higher order thinking skills that stresses on synthesis, analysis and evaluation.
- Thinking skills are an absolute necessity for a society that is faced with rapid changes.
- It has been said that for tomorrows curriculum its better not just to teach about the specific knowledge since technology change so rapid but perhaps better to teach the students about HOW to make sense of the new information.



BALANCED STEM EDUCATION

- We also need to inculcate values and creation of balanced graduates.
- While the graduates are driven to undergo wealth creation for the country there is a need to balance that with values and obligations to do good for society.





What kind of future generation do we want?

A fundamental objective of any education system is to ensure that its students are being equipped with the <u>knowledge</u> and <u>skills</u> required for <u>success</u> in life.

- Graduates that can meet the 21st century challenges
- Critical thinking skills, entrepreneurial, holistic and balanced
- Balanced between character and knowledge



Global focus :

- Higher order thinking skills (HOTS)
- Project-based
- ICT & games-based
- STEM education STEM skills , TVET
- Industrial Revolution 4.0 digital economy, industrial needs & commitments





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Industrial Needs

- What are the skills need by the employer/industry?
- Report by Allison (2017):
 - Skilled production worker
 - Engineering skills
 - Information technology
 - Scientific skills
 - Technical skills
 - Critical thinking skills
 - Problem-solving skills
 - Communication skills





How can RECSAM contribute in bridging the gaps?



STEM TEACHER TRAINING

BACKGROUND

To prepare STEM teachers with knowledge and pedagogical skills on STEM education To strengthen teaching instructions and application of STEM principles in classrooms To develop hands-on STEM activity training modules

Need for upskilling of STEM

practitioners

WAY FORWARD

AIMS

STEM TEACHER TRAINING PROGRAM

Pedagogical approach on effective STEM practices in classroom



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HOLISTIC, ENTREPRENEURIAL AND BALANCED GRADUATES

Entrepreneurial Mindset
Embedded in the curriculum/stand alone.





Experiential Learning/service learning

 Alternate periods of academic study with periods of work experience (2U+2I)

Spirit of Volunteerism

• Embedded in the curriculum/stand alone





RECSAM's ROLE & CONTRIBUTIONS

- Promote and enhance science and mathematics education through STEM activities – customized course/workshop, in-country workshop
- Provide STEM training through workshops, regular course
- Conduct STEM research and development activities seminars, colloquia, symposium (TIMSS/PISA), publication - journal
- Strong collaboration SEAMEO sister centres, JICA, MTCP, MOEs, universities etc
- Harnessing human resource development



Promote STEM activities :









Provide STEM training – Regular courses (Two intakes per fiscal year)











Conduct STEM research & development : Colloquium, seminar and symposium











Strong collaboration & networking :











Harnessing human resource development – TQM workshop with SEAMEO SEN (31 Jan 2019)











THANK YOU ありがとうございました



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