Asia-Pacific Economic Cooperation

STEM Village

Promoting and Spreading Awareness about STEM to Families and Society

Dr. Wahyudi

"Learning Mathematics Joyfully and Meaningfully"

Rationale

STEM has been the major trend in the world of Indonesian education. Various STEM-related agenda (training, workshops, etc) have been conducted for the last few years.

The effort made by government and related institutions so far are confined to school settings.

Solution: out-of-school-time STEM activities

Out-of-school-time (OST) STEM program

Are described as personal, contextualized, and time-consuming

STEM learning activities that occur outside of formal school setting

Out-of-school-time (OST) STEM program

STRUCTURED

museum visits, afterschool club, mathematics competition, and the like.

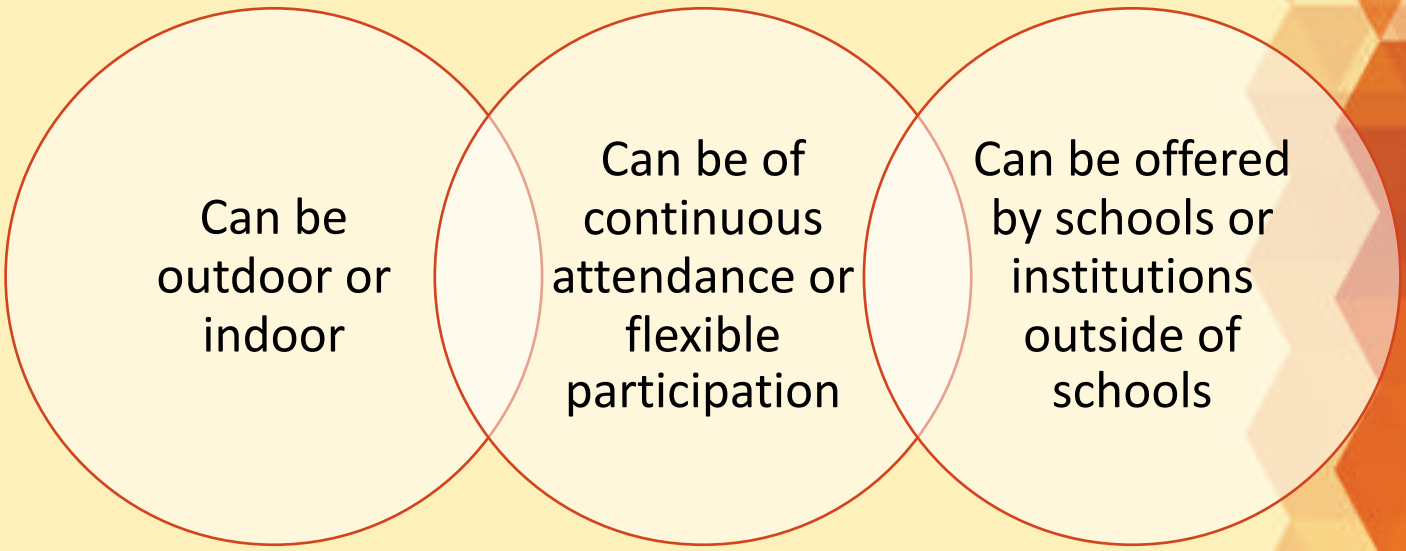
UNSTRUCTURED

happen solely because of the students' personal interest e.g. tinkering with objects, doing experiment on their own, or researching things online

For definition purpose, this presentation will only consider structured OST STEM program.

Out-of-school-time (OST) STEM program

… is versatile.



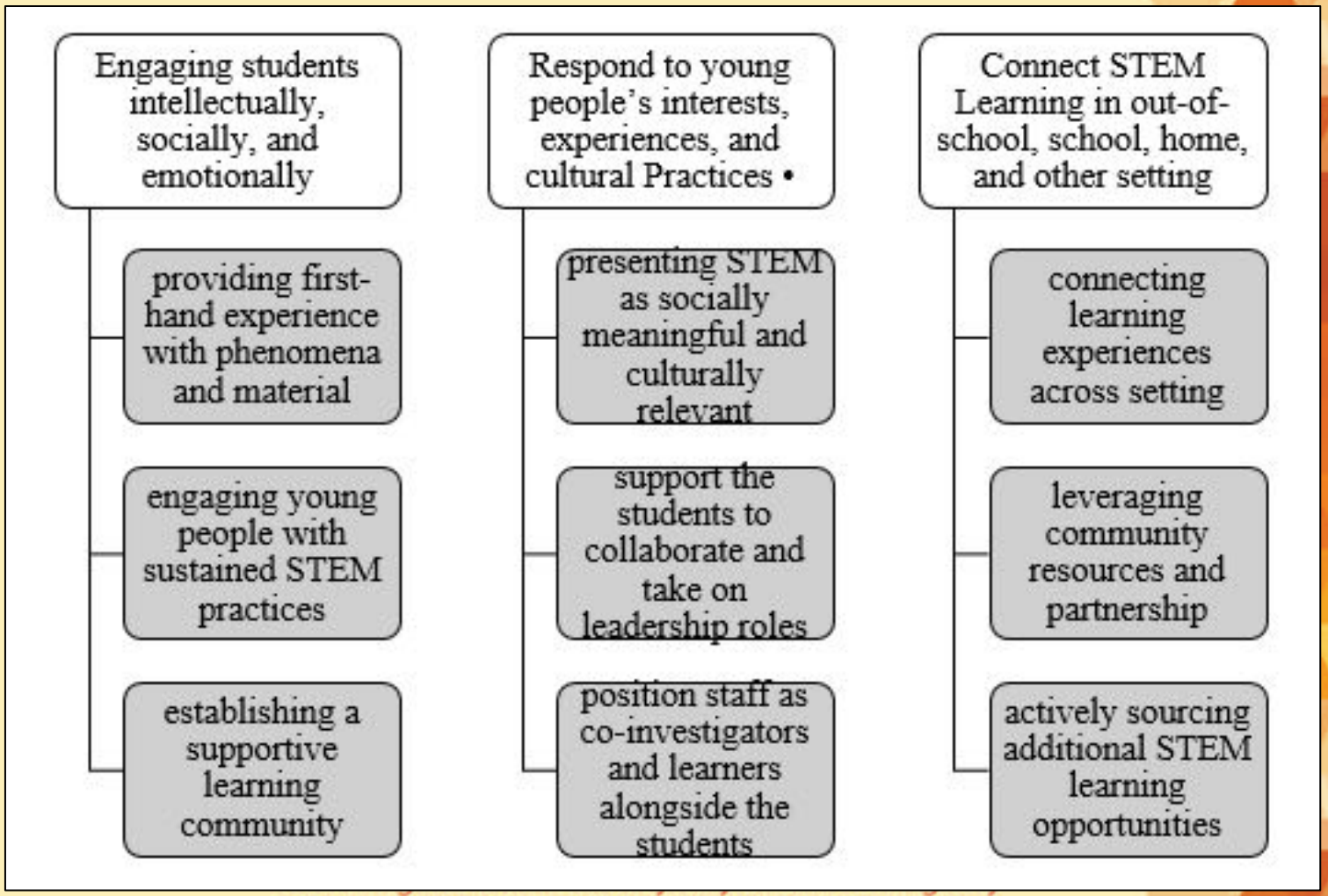
Out-of-school-time (OST) STEM program

The difference with School STEM program:

- tend to be less verbal and abstract, more tactile and built on sensory experiences.
- low-stakes (non-evaluative), they put less pressure for the student, especially low-achievement students.
- less confined within mandated curricular guidelines; hence more flexibility to explore
- provide more ground for group or collaborative investigation, rather than individual learning activities

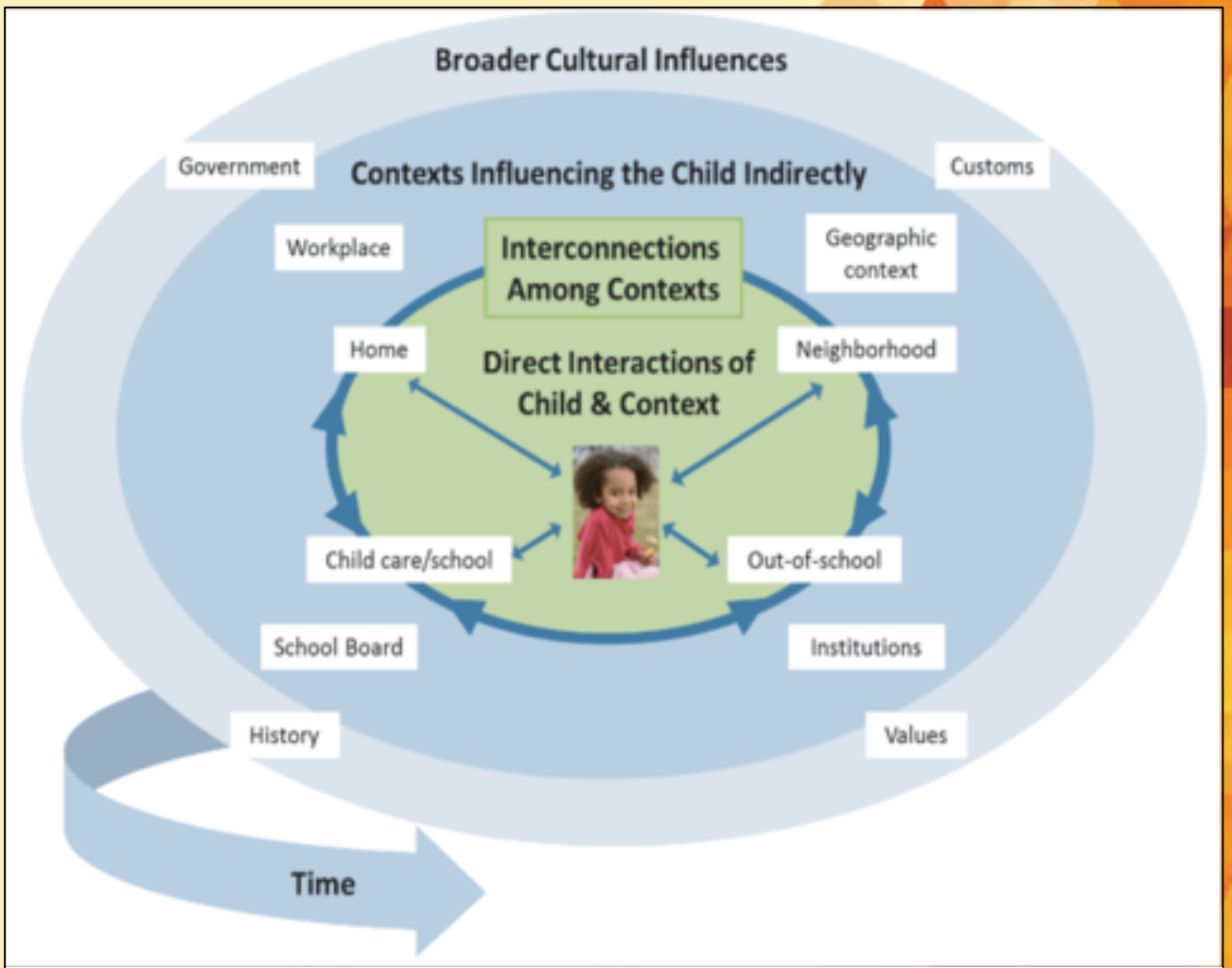
Criteria of successful OST STEM programs

According to National Research Council (2015):



Family involvement in OST STEM program

One factor found to be pivotal in the development of the students' attitudes toward STEM subjects is parental involvement.



STEM learning ecosystem model (National Research Council, 2015)

OST STEM program by SEAQiM: STEM Village

… also known as *Kampung STEM Joho*

- started in November 2018
- Held once a week
- Voluntary participation of mothers and children from neighborhood near our office.
- Still in initial phase

Consideration in designing the programs

Parental involvement.

Aside from children, mothers are also participating.

The contexts used in every activity are **socioeconomically and culturally relevant**

practical, **tactile**, and **hands-on** experience, as well as **collaborative**.

partnership with local community.

+

“entrepreneurship”

Example of activities: *tenun ikat* (tye-dye)

Traditional fabric coloring method by tying the fabric to prevent color to seep in, thus creating pattern.

Example of activities: ecoprint

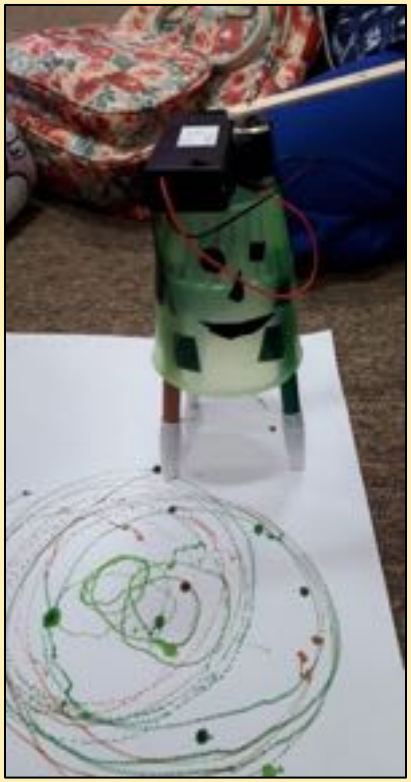
Fabric coloring method by using pigment color of plants body part, such as leaves and flowers.

A visit by a school committe

"Learning Mathematics Joyfully and Meaningfully"

Example of activities: wigglebots

Activity to introduce the principle of robotic to the students, using everyday objects.



Reflection

STEM village so far has shown potential to be a platform for families to not only explore STEM subjects and its relevance in solving problems in real life, but also to encourage STEM career choice for the children and to provide entrepreneurial activities for the mothers. This project brings potential to promote STEM not only in school setting, but also to other contexts that are close to children's life, for example home, families, and neighborhood.

Future concern

As STEM Village project is still in a very initial stage, there are several concerns that we need to address.

Curriculum

We need to establish sequence of topics that are suitable for the context yet support the students' knowlegd development

Evaluation

We need to find a way to assess and evaluate the effectiveness of the program

Scalability

We need a reliable method to scale it for different setting or number of participants, for STEM village to reach broader audience.

Q & A

Ask away! ☺


Thank
You
Suksama
Maake
Asante
Shukria
Dhanyavadagalu
Vinaka
Kiitos
Manana
Dankon
Suksama
Dank Je
Mauruuru
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