Mini-Conference on Learning and Teaching @ HKIED

Understanding students' mobile-assisted seamless learning from an ecological perspective

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Overview

- Background
- What is mobile-assisted seamless learning?
- How to understand students' mobile-assisted seamless learning?
- An example
- Wrap up

Background: Students at HKIEd

"We sat in the pacific coffee for around 5 minutes, and as we visually observed there are total 30 students passing by and 12 of them (40%) were using their mobile devices. Here is the evidence." reported by undergraduate students at HKIED in their group project.

What is mobile-assisted seamless learning?

Mobile-assisted seamless learning refers to "the seamless integration of the learning experiences across various dimensions including formal and informal learning spaces, individual and social learning, and physical world and cyberspace" in 1:1 (one-mobile-device-per-learner) setting.

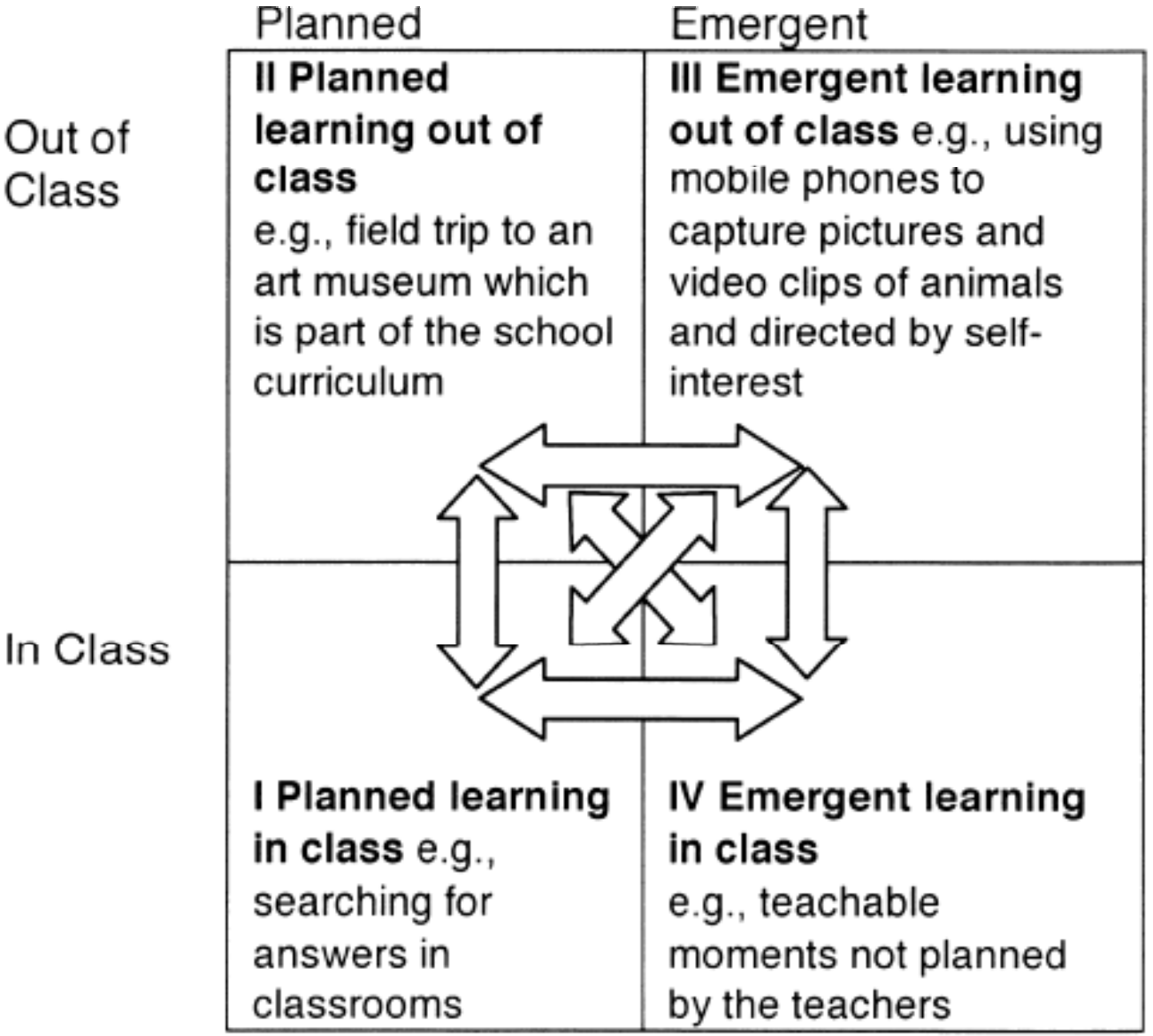
（Wong & Looi, 2011, p. 2364)

What seams have been removed from mobile-assisted seamless learning?

- (MSL1) Encompassing formal and informal learning;
- (MSL2) Encompassing personalized and social learning;
- (MSL3) Across time;
- (MSL4) Across locations;
- (MSL5) Ubiquitous knowledge access (a combination of context-aware learning, augmented reality learning, and ubiquitous Internet access);
- (MSL6) Encompassing physical and digital worlds;
- (MSL7) Combined use of multiple device types (including “stable” technologies such as desktop computers, interactive whiteboards);
- (MSL8) Seamless switching between multiple learning tasks (such as data collection + analysis +communication).
- (MSL9) Knowledge synthesis (a combination of prior + new knowledge, multiple levels of thinking skills, and multi-disciplinary learning);
- (MSL10) Encompassing multiple pedagogical or learning activity models.

(Wong & Looi, 2011, p. 2367)

Matrix of students' learning spaces



(Chen et al. 2010)

How to understand students' mobile-assisted seamless learning?

To examine learning, Edward (2005) proposes two intertwined focuses on

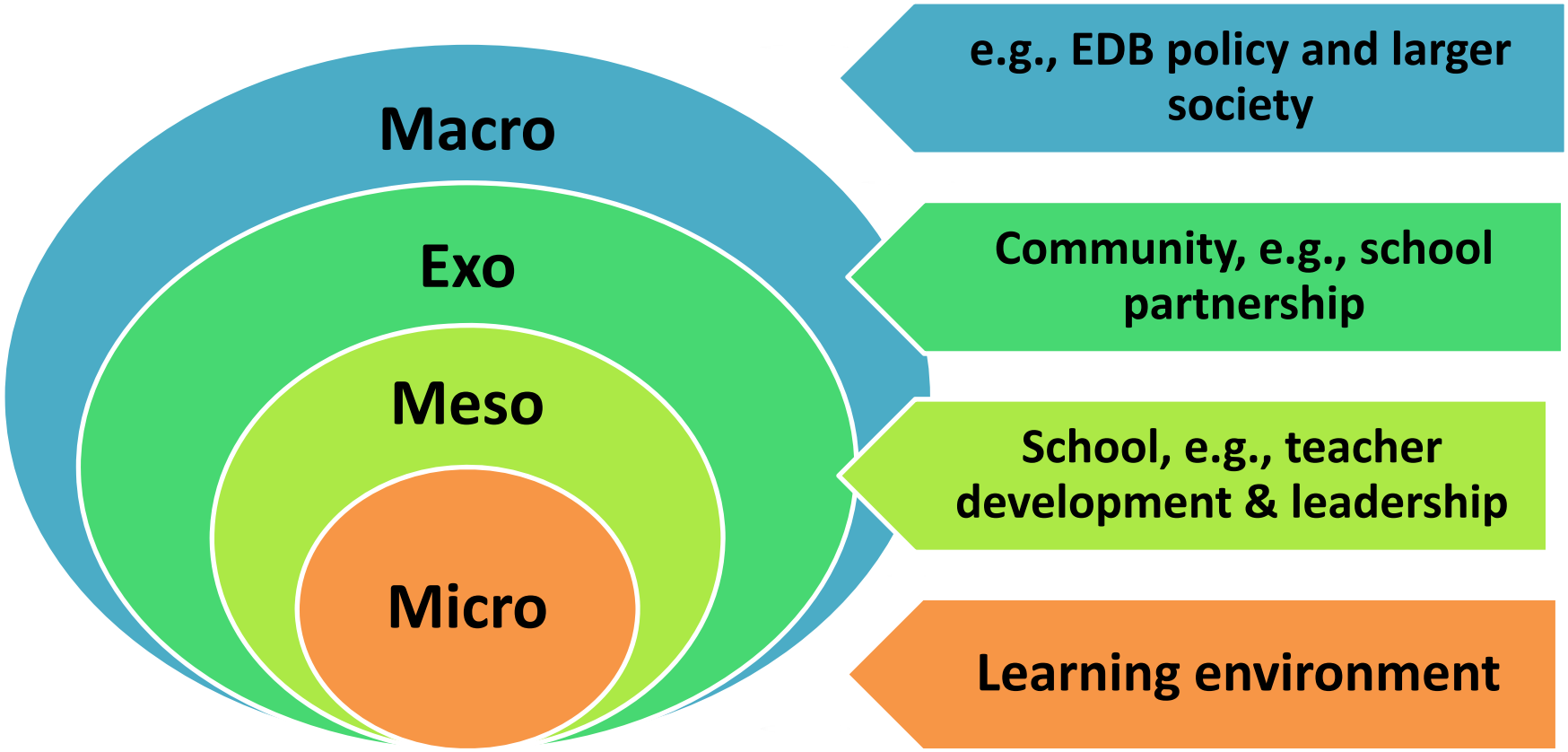
(1) how learners interpret and act on their worlds, and

(2) the opportunities afford them for those interpretations and actions.

Different perceptions

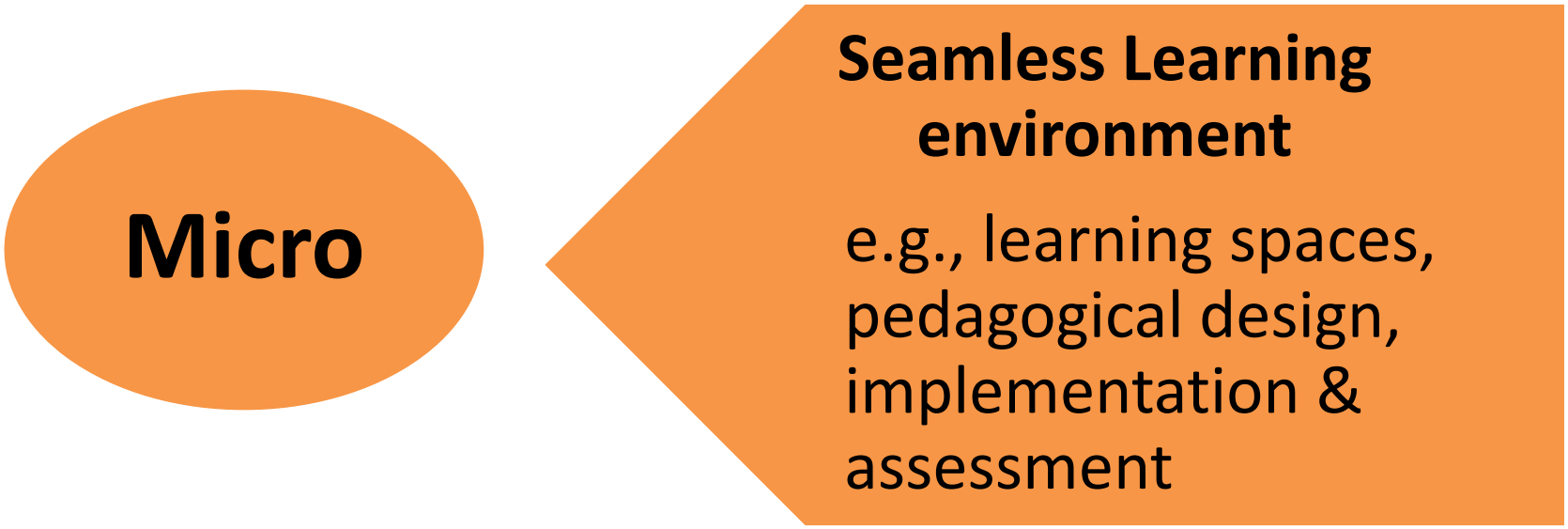
- There is "a potential divide between the emergent life-world as intended by the teacher and that which is experienced by individual students" (Barab & Roth, 2006, p. 8).

Ecosystem



School Ecosystems (Bronfenbrenner, 1994; Zhao & Frank, 2003)

Focus: The Micro System



An ecological theory of knowing

An ecological theory of knowing

(1) situates knowing and meaning as part of individual–environment relations

(2) holds that meaningful learning occurs in participation in individual–environment interactions.

(3) holds that ideas and concepts learned in such situations can be powerful tools for further learning and participation in the individual-environment relations.

(Barab & Roth, 2006).

Disruption of the ecosystem

When students are

- imparted core ideas as isolated facts or abstract concepts, and
- these facts and concepts are no longer connected to the situations that allow them to be powerful tools in the world.

Educators fail to engage students in meaningful relations

An ecological theory of knowing

The teacher needs to

- stop governing the environment and
- stop controlling relations between the learners and the environment;

The teacher should

- allow the learners to perceive and act on the affordances of the ICT in the learning environment and
- create their own contexts-of- use of ICT (Naismith, Lee, & Pilkington, 2011).

How to understand students' learning in a mobile-assisted learning environment?

Seamless learning generally happens only in specific and defined learning episodes leveraged by mobile devices (Song, 2011).

- What types of environments and goals students would like to be engaged?

- How do students engage in these environments and goals?

An example

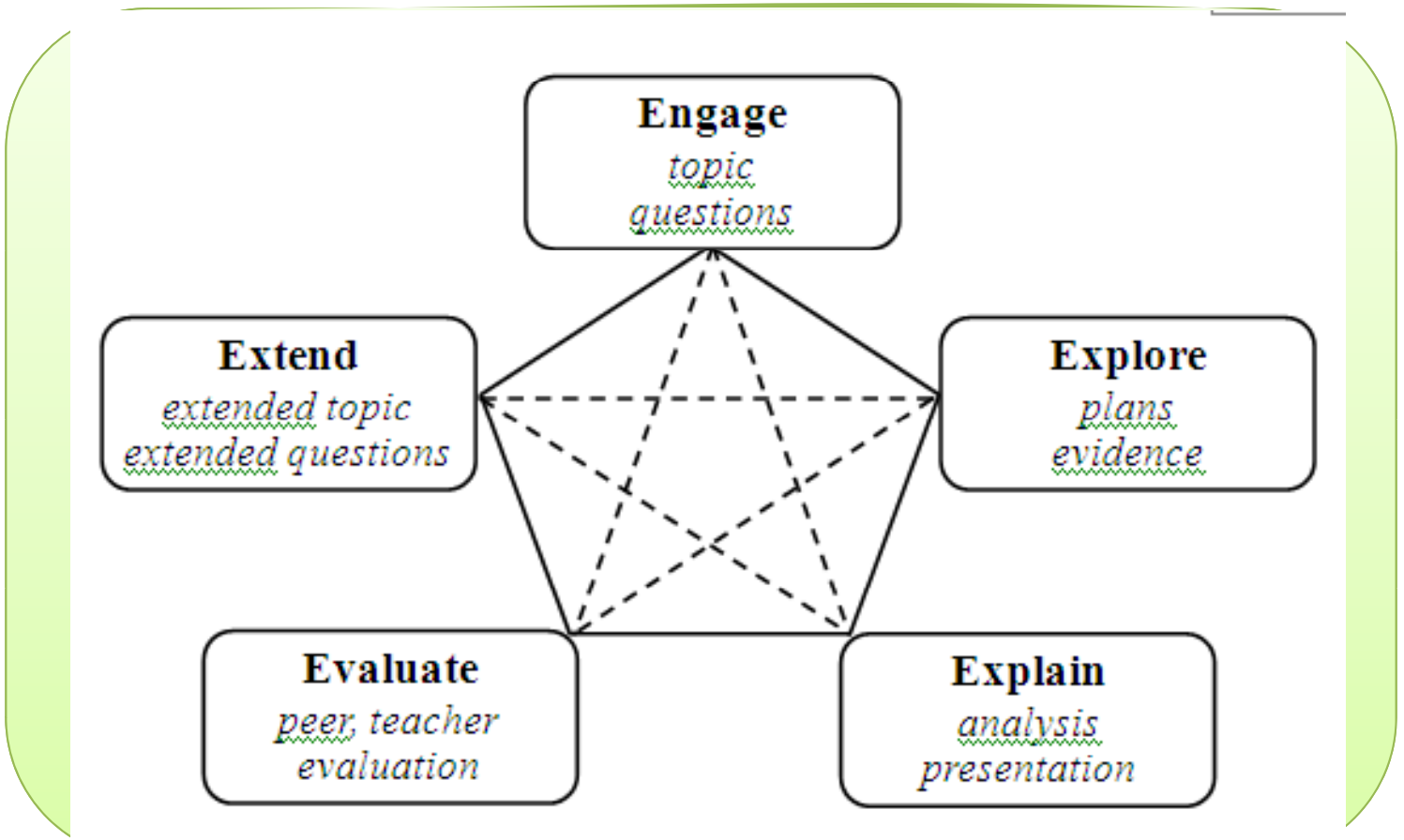
5-E inquiry-based learning in a mobile-assisted seamless learning environment

- To understand the life cycles of a butterfly and a spinach plant in a Primary 4 class in a Singapore school

Smartphones were used on a 24/7 basis to support the seamless science inquiry.

(Song, Wong, & Looi, 2012).

5-E Inquiry-based Learning Model



Inquiry-based Learning Model

Seamless science inquiry

Encompassing School – Farm – Home – Cyberspace

1E: Engage (Topic & Questions)

- Topic
  - Understanding of the life cycles of a butterfly and a spinach plant

1E: Engage (Topic & Questions)

- Raise questions

Who raise questions?

Questions to explore

By the teacher

General questions:

1. What is the life cycle of a butterfly? How many stages are there? Please draw the stages.
2. What is the life cycle of a spinach plant? How many stages are there? Please draw the stages.

What Do I Want to Know?

By the students

- Do all insects have 6 legs?/what plants does a butterfly go?
- Why does a caterpillar's skin shed? / why some butterflies reproduce in a bunch?
- How many times does butterfly moult?
- Which butterfly is the rarest?
- How a male butterfly attract female / Why butterfly lay egg differently? / Does butterfly look after their young?
- How many leaves does a caterpillar eat a day? / What is the colour of a caterpillar?

2E: Explore (Plans & Evidence)

- Investigate a problem about an idea or concept:

  - Who plans?
  - What evidence can be provided?

Who plans?

Teacher-led activities:

- Pre-field trip: Instructions
- (KWL: What do I KNOW? What do I WANT to know?)
- During field trip: Reflective worksheets
- After field trip: Sharing their drawing of a life cycle of a butterfly and the spinach plant

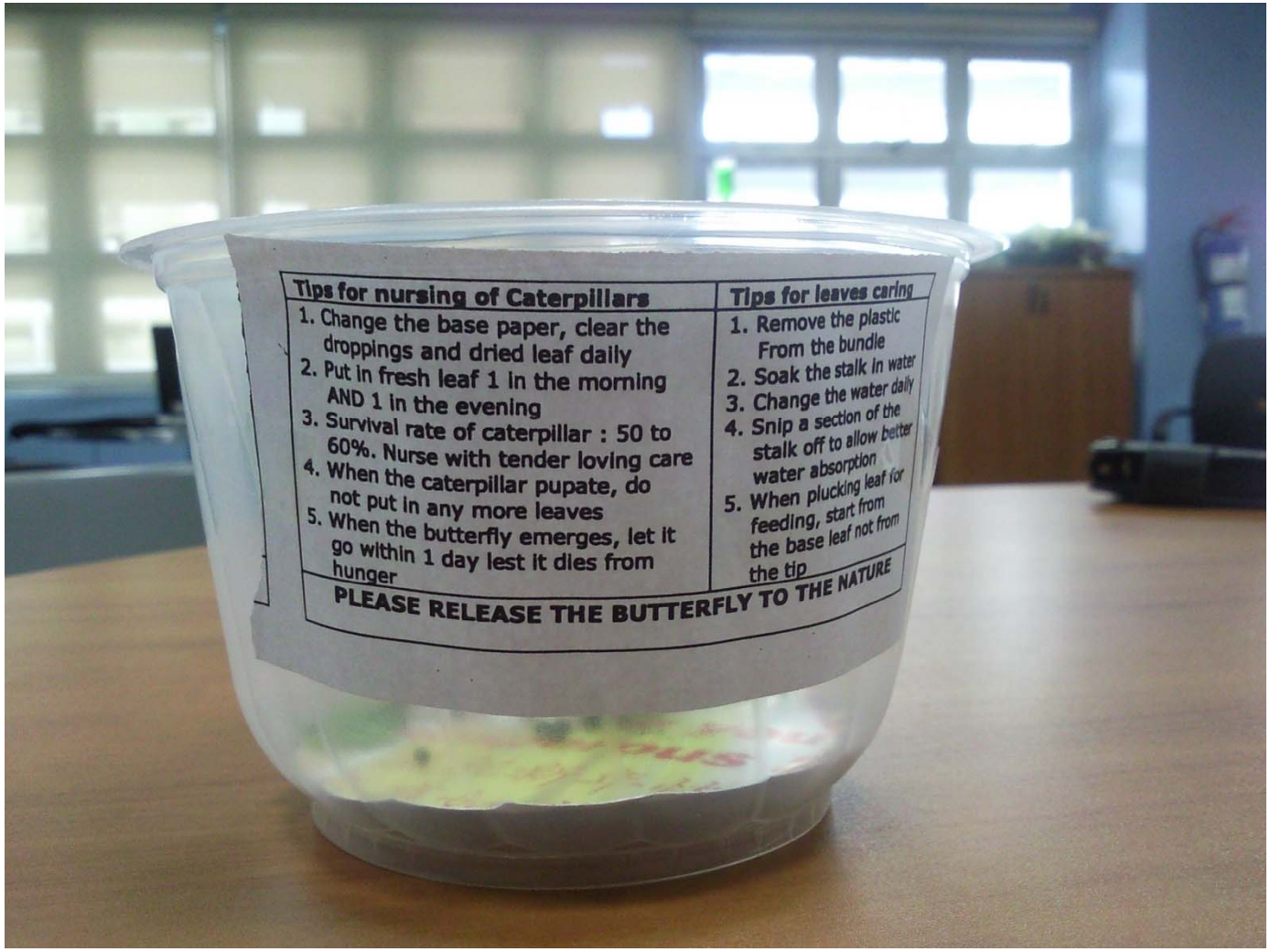
(What did I LEARN?)

Before the field trip

Students were encouraged to purchase

- the Spinach hydroponics （水栽菠菜套裝）and
- butterfly kits（蝴蝶培育套裝）

Butterfly Kit 蝴蝶培育套裝



The Spinach Pet Bottle Hydroponics
水栽菠菜套裝

Who plans?

Student-driven activities:

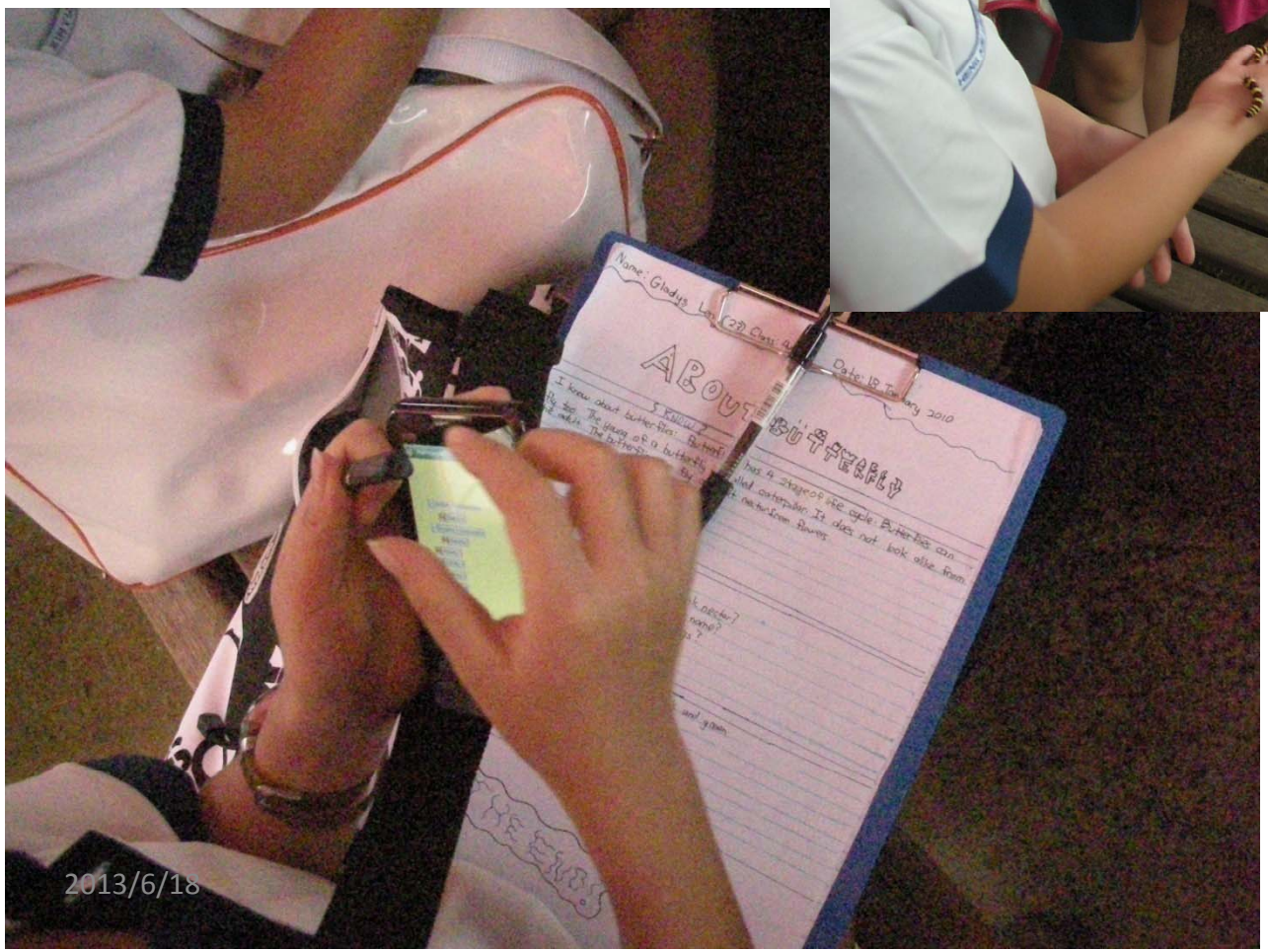
- Whether to purchase the Spinach hydroponics and butterfly kits or not;
- What data to observe and collect;
- What evidence to be provided for their research questions;
- How to present and share in class?

What evidence?

Data collection

What evidence?

Data collection



Data collection

3E: Explain (Analysis & Presentation)

- **Analysis**: Make sense of the idea or concept.
- How? Through analysis of data and observational experience

A butterfly has 4 stages. A caterpillar only uses 6 legs to claw. A caterpillar doesn't eat and move during pupa stage (by a student).

3E: Explain (Analysis & Presentation)

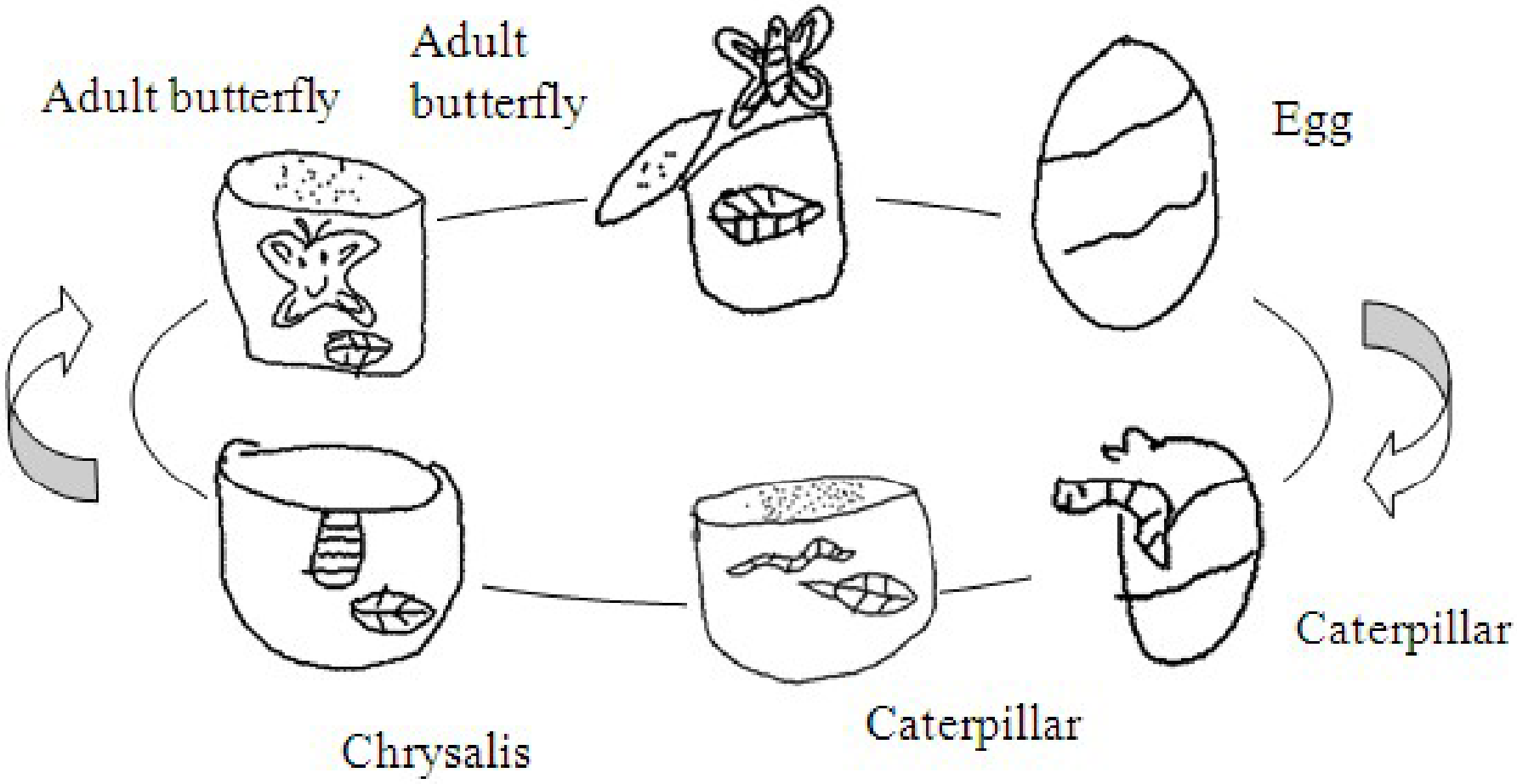
Presentation



Documenting the growth of a butterfly

Presentation: Life cycle of a Butterfly

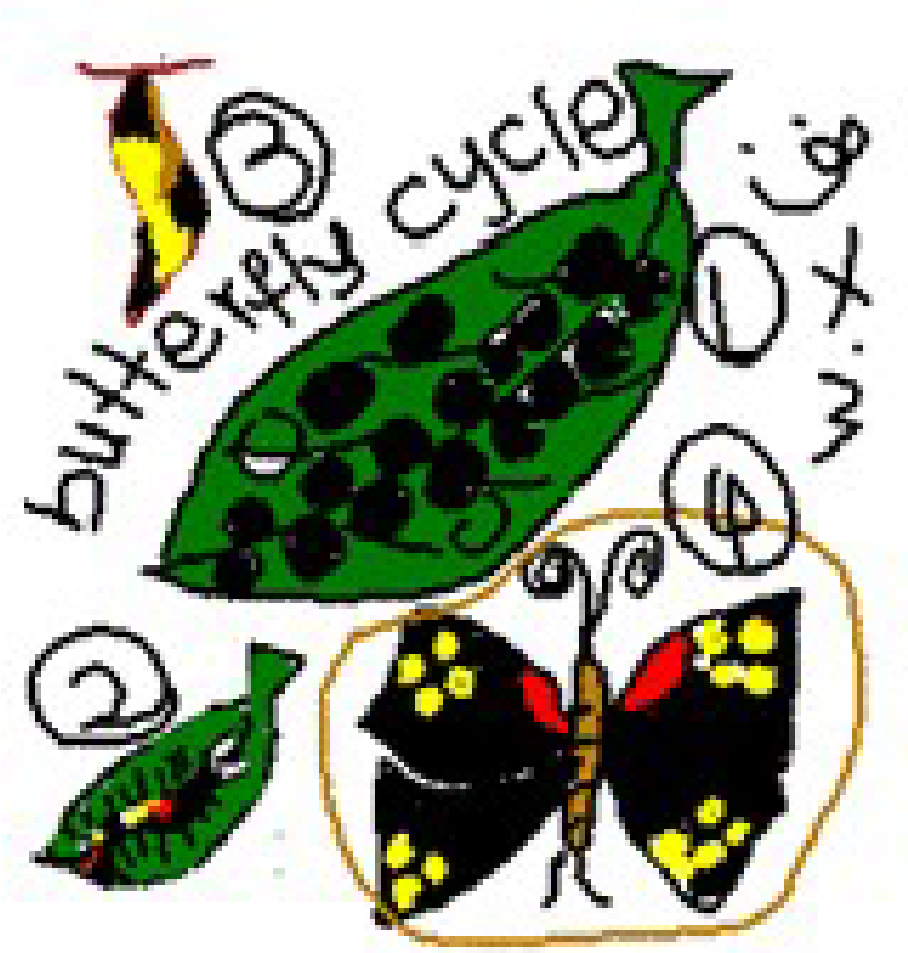
by a student who bought the butterfly kit



Documenting the growth of a butterfly by a student

Presentation: Life cycle of a Butterfly

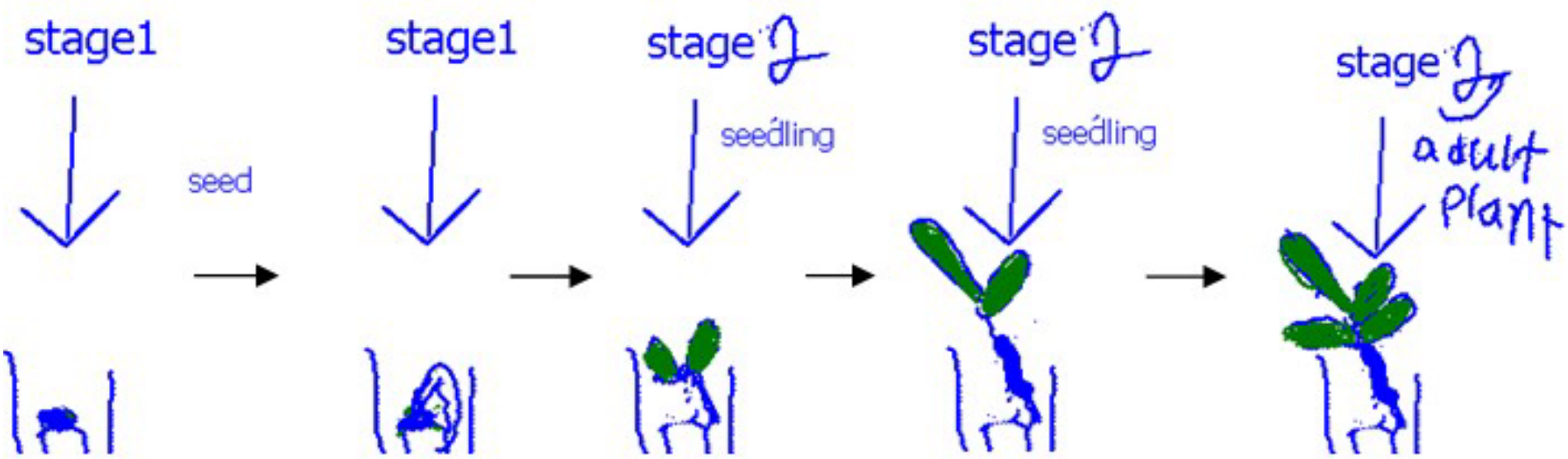
by a student who DID NOT buy the butterfly kit



The life cycle of a butterfly by another student

Presentation: Life Cycle of a Spinach Plant

by a student who bought a spinach pet bottle hydroponics



Sketchy animation of the life cycle of a spinach plant (Kang Kong)

Presentation: Life Cycle of a Spinach Plant

by a student who DID NOT buy a spinach pet bottle hydroponics

The sketchy animation of the life cycle of a spinach plant (Kang Kong)

4E: Evaluate (self, peer or teacher evaluation)

- Make embedded assessment during inquiry process.
- Who assesses?

Self assessment via reflection

- *Before observation:*

"What I want to know? - "What plants does a butterfly go?".

- *After observation:*

what I have learned? - "A butterfly usually goes to buddleia (醉鱼草属), lantana (馬纓丹), sunflower …".

- *Before observation:*

The student considered : "A butterfly lays eggs".

- *After the observation:*

The student added, "Butterflies choose the leaves they eat to lay eggs."

Peer assessment

- Peer assessment: Online or in-class sharing

Teacher assessment
(on the topic of hydroponics

- ***Picture of the Nutrients Tank***

Explain how can you tell the water level in the tank? Discuss with your teacher/facilitator.

5E: Extend (extended topic & questions)

- Apply ideas and concepts to a new contextual setting or investigate a problem about a concept in greater depth (e.g., water cycles)
- Key inquiry questions include:

  - What are the cycles in our everyday life?
  - How are cycles important to life?

What we observed from this study?

The students were provided the opportunities to

- investigate authentic problems,
- raise their own research questions,
- plan their research methods,
- explore their the research questions,
- Observe, analyze and explain their research findings
- evaluate their learning process, and
- apply the concepts to new situations.

Wrap up: What can educators do to support students' learning?

Educators cannot

modify the curriculum for each student,

But educators can

design environments that are more likely to engage a diverse range of students (Barab & Roth, 2006, p. 11).

Let's work together to understand students' learning and their world.

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Thank you!

謝謝！

Q & A