

The background image shows a group of students participating in an outdoor activity. In the foreground, a student in a purple shirt is bending over a large, clear plastic bin filled with various pieces of trash, including plastic bottles and food wrappers. Another student in a grey sweater is standing next to the bin, looking at the waste. In the background, another student is visible, and there is a large pile of trash on the ground. The setting appears to be a natural area with green plants and a dirt path. The text is overlaid on a semi-transparent blue rectangle on the left side of the image.

WHEN SEPARATION AND RECYCLING IS NOT ENOUGH: BRINGING KIDS TO UNDERSTAND THE REAL-WORLD PROBLEM OF COMMUNITY WASTE MANAGEMENT WITH PLACE- BASED LEARNING

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- Waste problems and environmental education during and post COVID-19 era
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The amount of infectious and plastic wastes were increased since COVID-19



The Thailand Environmental Institute (TEI) estimated that the amount of used surgical mask nearly reached 1 million pieces a day.

Plastic waste was increasing from 1,500 tons to 6,300 tons a day or 2 million tons yearly because of soaring orders for food delivery services.



Environmental Education in school



Awareness and action on waste management

Most focus on educate students to collect, sort and recycle waste which were end-result solutions

Empathy and sense of ownership should be cultivated, as well as knowledge and skills for protecting the environment.

How to develop environmentally responsible citizens?

Place-based learning, connecting school to the community

Two-days, place-based learning about community waste problem was demonstrated to Kurusapha primary school in Thong Pha Phum District, Kanchanaburi Province, Thailand.





Exploring the community and collecting garbage



Garbage sorting





Measuring amount of each type of waste

What did the students find?



There were many types of garbage scattered in the village, both on land and in water, including general waste, organic waste, recycled waste, hazardous waste, and infectious waste.

Most of the garbage was general waste, especially snack packaging, which cannot be recycled.

There were more garbage than the students could collect.



Shocking facts about infectious waste:

- Many used face masks were found on the ground.
- Used sanitary napkin was found mixed with organic waste dumped in the stream.
- Used diapers were dumped into a water source.



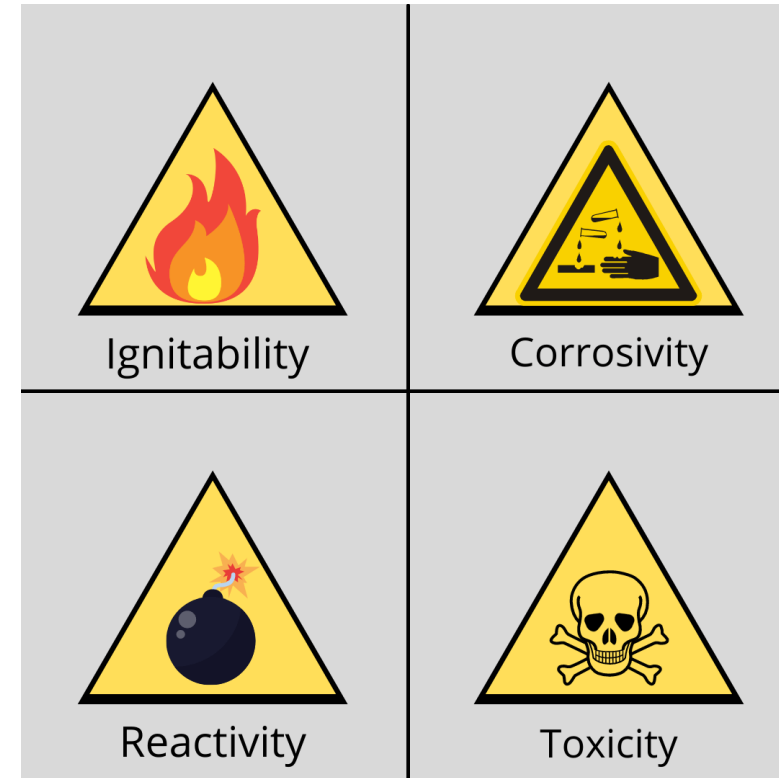
Some misconceptions need to be clarified



- Definition of hazardous waste
 - a hazardous waste is a waste with properties that make it dangerous or capable of having a harmful effect on human health or the environment.
 - The four hazardous waste characteristics are ignitability, corrosivity, reactivity, and toxicity.

<https://www.epa.gov/hw/learn-basics-hazardous-waste#hwid>

<https://www.elkenv.com/hazardous-waste-characteristics-an-overview>



Some misconceptions need to be clarified



- Infectious waste and hazardous waste are not synonymous.

Infectious waste	Hazardous waste
The infectious waste stream is intended for biohazard burdens, such as blood and body fluids, and this waste is often autoclaved (steam sterilized), compacted, and sent to a special landfill.	The chemical properties of hazardous waste are not eliminated by the autoclaving process; autoclaving is an inappropriate and ineffective method for treating hazardous waste.

<http://www.mntap.umn.edu/industries/facility/healthcare/waste/infectious/>



Investigating aquatic macroinvertebrates in the village stream



The village stream has moderate to good water quality

รวม	1	2	3	4	5	กลุ่มน้ำสีชมพูบัสตัว
	×	×	×	×	×	แมลงเกาะหิน
	×	×	×	×	×	ชีปะขาว ^B กลุ่ม 1
		×			×	แมลงหอนนอกโพรงไม้ ^C อยู่เปลือก กลุ่ม 1
		×			×	แมลงหอนเปลือกไม้ ^D อยู่เปลือก กลุ่ม 1
	×				×	แมลงข้างกรวย ^E ไท
	×				×	แมลงปอเต็มทรงใบ ^F
	×				×	แมลงหอนเปลือกไม้ ^G อยู่เปลือก กลุ่ม 2
	×	×	×	×	×	แมลงปอ ^H & แมลงปอเต็มอื่น ๆ ^I
		×				กิ้งก่าจืด ^J
						หอยกาบ ^K กลุ่ม 1
	×	×				หอยฝาเดียว ^L กลุ่ม 2
			×			ชีปะขาว ^M กลุ่ม 3
			×			แมลงหอนเปลือกไม้ ^N อยู่เปลือก กลุ่ม 2
					×	หอยฝาเดียว ^O กลุ่ม 2
					×	ชีปะขาว ^P กลุ่ม 3
						แมลงชีปะขาว ^Q กลาย
						หอยกาบ ^R กลุ่ม 2
	×				×	หอยฝาเดียว ^S กลุ่ม 3
	×				×	หอยฝาเดียว ^T กลุ่ม 3
	×				×	หอยฝาเดียว ^U กลุ่ม 3
รวม	14					

What did the students learn?



The stream provides food, recreation and aesthetic values to the village people.

Wastes dumped into the stream not only cause visual pollution but also impact to water quality, aquatic animals, and human health and well-being.



As the stream water quality is moderate to good, it's not too late to take care of the village stream.

The root-cause solutions are required for sustainable waste management.



Actions that students proposed to do on their own.



Waste reduction



Selecting snacks with
eco-friendly packaging



Communicating their
parents and other
community members to
manage household
waste.

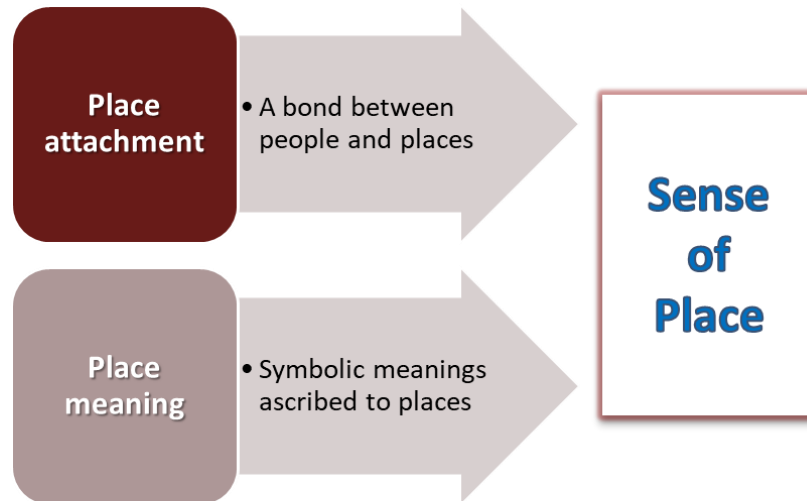
How place-based learning benefits environmental education



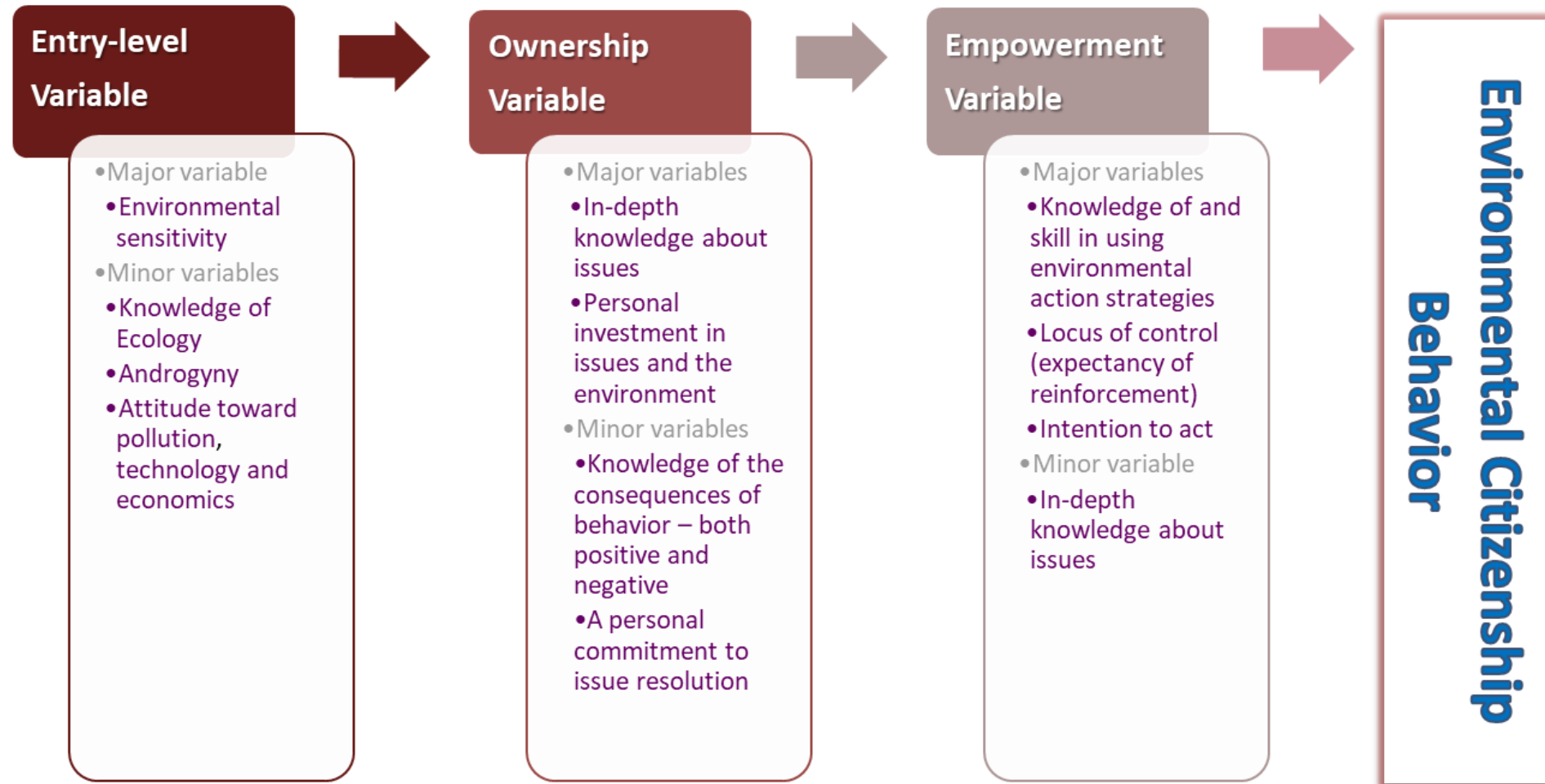
Place-based learning motivates student's sense of place



It helps changing awareness to action which is the ultimate goal of the environmental education.



Recommendation for teacher education



(Hungerford and Volk, 1990)

THANK YOU



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