Towards Transformative Pedagogies for Sustainability Education

Tan Qian Hui *Asia Research Institute*

Tricia Seow *National Institute of Education*

Transformative Pedagogies in Sustainability Education

Sustainability education should not only strive for pedagogical excellence, but also the formulation of transformative pedagogies. Whereas sustainability education denotes the transmission of sustainability-related content, the pedagogical or praxis-oriented dimension of sustainability education involves the curation of a conducive learning environment supported by an educator's teaching philosophy (Hegarty and Holdsworth 2015; Taimur 2020). For instance, the Sustainability Learning Lab at NIE has devised signature pedagogies for sustainability education that are informed by a critical philosophy and actualised vis-a-vis a three pronged approach, that of (i) inquiry-based learning (with a focus on taking action), (ii) place-based learning (including field work and/or field-based learning) and (iii) technologically-enabled learning (through the use of, for example, Geographic Information Systems and Remote Sensing).

Sustainability education in the form of *Education for Sustainable Development* (ESD) has gained traction in light of the *2030 Agenda for Sustainable Development*, which is well supported by political leaders globally (Sandri and Holdsworth 2021). ESD is also featured as one of the 17 Sustainable Development Goals (SDGs) in the 2030 Agenda which covers the 5 key 'capitals' of sustainability (economic, political, social, cultural and environmental). ESD is predominantly committed to enhancing students' understanding and capacities for ensuring economic viability, social justice and environmental integrity (Hallinger and Nguyen 2020; Taimur 2020; Corres et al. 2020).

The literature on ESD has been focused on identifying the core competencies (Wiek and Lang 2016; Rieckmann 2018; Evans 2019) for nurturing 'sustainability citizens' (Wals 2015 et al.; Wals and Lenglet 2016), also known as sustainability competencies. Academics working in the domain of ESD have listed some common competencies for coping with the wicked problems (i.e. problems that are open-ended and contested Hull et al. 2018; Marouli 2021) associated with for instance, climate change, inequality as well as ecological degradation. Aside from 'wicked problems', Heifetz (2006) terms these daunting threats 'adaptive challenges' (evolving problems that cannot be remedied by or solved with current knowledge) while Schumacher (1977) calls them 'divergent problems' that are unlikely to lead towards a single convergent solution. Some of these sustainability competencies include critical, anticipatory (i.e. having foresight) and systems thinking (i.e. an awareness of interconnections, interdisciplinarity)[i].

Since behavioural change (e.g.

mitigating and adapting to planetary threats) is a desired outcome of ESD, sustainability education scholars have conceded that a paradigmatic shift from a transmissive to transformative mode of learning is imperative (Corres et al. 2020; Taimur 2020; Marouli 2021). They have clarified that the objective of transformative learning extends beyond the transformation of the learner, to that of social structures more broadly (by challenging socio-institutional norms for example, see hooks 1994). Specifically, they have evinced that the dissemination of sustainability-related information (including consciousness-raising) alone is inadequate at spurring learners to transform the society/environment that they live in (Blenkinsop and Morse 2017; a reliance on state intervention or regulation is common). Consequently, Herranen et al. (2018) have contended that on top of stressing learner-centered outcomes (manifested in terms of competencies), ESD also needs to be learner-driven and action-oriented. A learner-driven curriculum nudges learners to become agents or actors capable of defining what sustainability constitutes and implementing feasible sustainable practices vis-a-vis an iterative process before power structures can be substantially reorganised.

Besides students' sustainability competencies, attention has also been paid to supporting relevant competencies for educators especially since "traditional pedagogies based on positivist epistemology and instrumental ideology are inadequate to explore [sustainability's] complexity" (Sandri and Holdsworth 2021: 675; Herranen et al. 2018). Educational scholars have advocated for the foregrounding of sustainability-related content that is nuanced (e.g. on a spectrum, from weak to strong sustainability, Gillespie et al. 2019) and even conflicting (Stevenson 2008; Stibbe 2009), as opposed to predetermined universal ones (Corres et

al. 2020). For example, Gillespie et al. (2019) define weak environmental sustainability claims as those that seek recourse through superficial measures while strong claims typically demand for a systemic overhaul or a structural shift in how the environment is being managed. In any case, debates on the ontological dimensions of sustainability are encouraged. Concomitantly, the notion that sustainability is a static state that is attainable some time in the future requires a thorough deconstruction (see Eaton et al. 2016). So does casting sustainability as a technological problem that can be readily rectified via technical-business solutions or in Gillespie et al.'s terms, weak sustainability claims (e.g. using energy efficient appliances).

In terms of disposition, educators have been advised to remain open-minded (Corres et al. 2020). Instead of 'indoctrinating' and or endorsing an unthinking conformity among their students, Dillon and Grace (2004) have stressed the importance of introducing them to multiple perspectives (and perspective-taking) when teaching them about 'controversial' ideas. On the other hand, educators have also been discouraged from taking a value-neutral position on ethical matters such as pollution and exploitation (Sandri and Holdsworth 2021). Ho and Seow (2015) also warned against creating "misrepresentative balance" in providing equal weight to climate doubters' perspectives in the classroom.

The overall assumption is that educators have the capacity for employing a teaching praxis that disrupts prevailing orthodoxies (Fiselier et al. 2018). Papenfuss et al. (2019) have pointed out that the transformative classroom is a chaotic realm of untapped creative energy may be difficult to manage in practice. For instance, Sipos et al. (2008) have recognised that educators may be ill

prepared for the possible adverse student responses (e.g. disorientation, detachment, feeling defeated) that such "discomforting pedagogies" can engender (Zembylas and McGlynn 2012). Educators are thus prompted to perceive of "themselves as fallible human beings rather than people with all the answers" (Taimur 2020: 675) or as self-disciplined adherents to all the best practices in sustainable living. Further, despite an emphasis on the transformative, the degree to which educators are willing to be transformed by the curriculum that they teach as well as how they cope with such a transformation (if applicable) have been glossed over in the literature.

Critiques of education for sustainable development

Although most educational experts have concurred that transformative learning is a quintessential ingredient that will determine the relative effectiveness of pedagogies in sustainability education (and ESD, e.g. Summerfield and Wells 2017; Papenfuss et al. 2019), there is still room for taking criticality more seriously. Criticality can be better integrated into ESD in two ways. First, it can be achieved by revisiting an eco-critical pedagogy *on, in* and *for* the environment (also known as environmental education, EE). EE emerged in the 1970s to 1990s as ESD's predecessor. Besides calling for an 'ecocritical insurgency' (Buell 2005: 12), EE holds on to a conviction that all of human life hinges on the sustainability of the earth. As such, EE is primarily focused on ameliorating environmental destruction as well as strengthening an eco-citizenship (Garrard 2010; Matthews 2011; Eaton et al. 2016; Marouli 2021).

Second, critical theoretical perspectives such as political economy, postcolonialism and ecofeminism can be better incorporated into the pedagogical design of sustainability

curriculum (see Matthews 2011). Critical scholars have suggested that pedagogies on sustainability education ought to put forth a more radical critique of sustainable development by for instance, interrogating the uneven distribution of power across a variety of scales, as well as the untenability of maintaining both (economic) development/growth and ecological health (e.g. Marouli 2021). Grigorov and Fleuri's (2012: 447) ecopedagogical slant has gone even further to lambast (education for) sustainable development as an imperialistic "universalization of [a] western cultural paradigm" rather than "critical problematization, conscientization, and taking conscious environmental and social justice action".

Moreover, Stains et al. (2018) have propounded that much of sustainability education (including ESD) still subscribes to a transmissive and instrumentalist teaching/learning approach, which tends to be the norm across many disciplines. The premise of a transmissive teaching practice (which could be couched as 'transformative') is that an educator possesses a readily available body of knowledge for 'transforming' sustainability-related challenges and that this can be unproblematically and unidirectionally transmitted to students (see also Papenfuss et al. 2019). Meanwhile, an instrumentalist mode of learning views the transmission of knowledge in institutions of higher learning as commodity exchange (Luke 2008) and "a means to an end" (Nolet 2016: 87), particularly with respect to employability within a job market (Evans 2019; Marouli 2021). Notably, the core competencies that ESD develop, such as problem solving and critical analysis do coincide with what World Economic Forum deems as 'work ready' twenty-first century skills (Thomas 2018; Santri 2022). Such transmissive and instrumentalist approaches fail to reflect on the educational

systems that allow for their perpetuation, as well as the role that education plays in reproducing unsustainable societies/environments.

Additionally, Huggan and Tiffin (2007; 2015) have made a case for a postcolonial unpacking of Western anthropocentricity (evident in discourses on sustainable development) whereby humans have positioned themselves as hierarchically more superior to other non-human species. Huggan and Tiffin (2015) have thus called for alternative imaginations of being ecologically connected across human and non-human divides (see also Derrida 2002 on the 'animal' and Plumwood 1993 on ecofeminist perspectives).

In sum, criticality is pivotal in animating a transformative pedagogy and its potential for transformation is arguably the key driving force of sustainability education. Nevertheless, while scholars have attempted to trace the contours of what transformative learning may look like (e.g. its characteristics), few have expounded on how it can be operationalised in the sustainability classroom. A transformative pedagogy has been touted as a holistic one involving contemplative and embodied (e.g. affective, intuitive) forms of knowing (Sipos et al. 2008). However, the scholarship on ESD is thin on how educators can translate their intention for transformativeness into their lesson plans and teaching practice on sustainability within institutional constraints. Taking Freire's (2007) conceptualisation of citizen schools as an innovative (i.e. inquiry-driven) and place-based eco-political enterprise as a point of departure, the rest of this paper argues that inquiry-based, place-based and technologically-enabled learning as praxis are invaluable in advancing transformative goals in pedagogies for sustainability education.

Inquiry based learning (with a focus on deliberation and taking action)

An inquiry based teaching-learning approach stems from a social constructivist tradition whereby students are motivated to create their own understanding about the world that they live in by asking critical questions (Garrard 2010), including an inquiry of their personal belief systems (Kitchenham 2008). Khalaf et al. (2018) have summarised the main aspects of inquiry based learning as active student engagement with respect to (i) the presentation of evidence (ii) formulating explanations for such pieces of evidence and (iii) communicating one's conclusions/explanations in light of pre-existing scientific theories (see also Walker et al. 2011 on argument-driven inquiry and Roberts 2014 on geographical enquiry).

Taken together, an inquiry based curriculum/classroom contributes to a transformative pedagogy in two respects; first, by fostering a questioning attitude and second, by empowering students to direct their own learning based on their interests (as opposed to didactic teaching fronted by the educator). The hope is that inquiry may facilitate the production of a dialogical and democratic environment whereby students would eventually, for example, examine what individuals/stakeholders are striving to sustain and why, in relation to particular spatio-temporal scales (Eaton et al. 2016). For instance, the privileging of short-term, technocentric remedies to sustainability-related challenges happens at the expense of inter-generational equity. Additionally, learner-driven inquiry (e.g. with students as course designers) allows students to practice exercising their autonomy (Herranen et al. 2018) so that they can become "constructive philosopher-agents of change" skilled at "envisioning, design[ing] and building" a more sustainable future (Marouli 2021: 7).

Much of an inquiry based approach appears to be founded on cognitive reasoning and intellectual problem solving. Consequently, it could be construed as a disembodied mode of learning (especially when it is confined to the classroom), with implications for impeding social action. The next section on place-based experiential learning complements inquiry's invariable focus on the contemplative by mobilizing the body in a more somatically attuned pedagogy. Educational scholars such as (Marouli 2021) have underscored the significance of embodiment as a frame of reference, especially in a contemporary digital age of space-time compression.

Place-based learning (including field work and/or field-based learning)

A place-based or lococentric pedagogy has always been a fundamental part of ecocriticism since the 1980s (Garrard 2010). Proponents of a place-based pedagogy have highlighted the significance of phenomenological attachments to lived everyday spaces in nurturing "an ethos of care" for "widening spheres" extending from the self to human and non-human others (Schindel and Tolbert 2017: 31). Thomashow (2002: 5) has posited that the "best way" to learn about the biosphere is to pay "close attention to the place where you live" and in so doing, develop a sense of "intimacy with [the] local natural history". Central to this "intimacy" is a romantic view of the redeeming qualities of returning to the natural environment urban dwellers are quite distant from. The guiding premise is that such "an ethos of care" or "intimacy" can cure "a numbing sense of alienation" (Christensen et al. 2008: 347), or at the very least, bring students physically and emotionally closer to the spaces that they would ideally defend from further degradation (see Marouli 2021; Sandri and Holdsworth 2021 on distant goals).

Place-based ecocritical pedagogies are also influenced by postcolonial critiques of sustainable development. For instance, Leopold's (2017) widely cited 'land ethic' encourages an ethical engagement with the land by introducing geographical ideas such as 'appropriate scale' and 'carrying capacity'. Likewise, Heise (2008) reaffirms the place of (a sense of) place in discourses on sustainability by highlighting the displacement of indigenous populations in the name of 'development' or 'modernisation'. Both Leopold (2017) and Heise (2008) have pointed out the myth of a placeless and seemingly objective enquiry from the top-down while advocating for a decolonial politics.

Nonetheless an eco-pedagogy that is rooted in place is not without its limitations. Critiques have been levelled at its unquestioned commitment to an ethics of proximity, buttressed by a reductionist presumption that lessons delivered through the environment would necessarily drive home an environmentalist point (see Garrard 2010). In other words, there might not be a "linear correlation between knowledge, awareness, and (pro-environmental) behaviour" (Wals 2011: 179). Additionally, the term proximity also perpetuates the pseudo-dichotomy between space as abstract and impersonal as well as place as subjective, intimate and local. Moreover, place-based eco-pedagogy is prone to the romanticization of localised 'nature' as a discrete and unitary category.

Nonetheless, the pedagogical purchase of place-based learning, not unlike its inquiry-based counterpart, lies in its ability to precipitate not just a cognitive but also an affective and relational shift in one's consciousness. Such a shift can perhaps transform one's way of "being in the world", or one's self-location vis-a-vis the 'physical'

or 'natural' realm irrevocably (Morell and O'Connor 2002: xvii; Corres et al 2020). Additionally, place-based approaches that contextualise service learning and fieldwork in the community for example, are profoundly experiential in nature — thereby stimulating the whole learner, in terms of one's head, heart and hand.

Experiential learning (including affective and kinesthetic) in the real world, does not happen in a socio-spatial vacuum and is therefore already place-based as well as teeming with the opportunities for sparking innovative inquiry. Crucially, educational scholars have noted that an immersive 'learning by doing' (Steinemann 2003) contributes to a transformative pedagogy by inspiring "alternative ways of seeing and doing" (Wals and Blewitt 2010: 66) even in the mundane and routine (Eaton et al. 2016; Taimur 2020). Some of these alternative, not-so-capitalist practices may include gifting, altruism and reciprocity (Luke 2008: 89).

Apart from exploring the 'outdoor classroom' (e.g. via field-based learning), educational experts have illustrated the innovative ways in which a hands-on indoor classroom can be invoked (Bache 2008). Whereas they have included the introduction of guest industry speakers, role-play and reality-based games as strategies (Taimur 2020), few have explored how an artistically inclined, multi-sensory sustainability workshop can be place and inquiry driven in practice, while aligning itself to an overarching transformative politics.

An exception would be Hauk's (2016) enactment of an art(istic) and ecology classroom, where she blends art-based (i.e. creative) methods with climate change education. Her classroom reflects a bioculturally responsive curriculum that takes its cue from a eco-pedagogical

emphasis on place affiliation and "earthy-grounding" (Hauk 2016: 190). "Earth-grounding" entails getting her students "down and dirty" in "mixing dirt and sand with water, then straw to create building materials", with them plunging their ankles in a "wet muddy stiff mix". Her introduction of dirt (as matter out of place, see Williams and Brown 2012) into the classroom serves to subvert binary categories associated with nature/culture, the wild/domesticated, indoors/outdoors, while fostering an "embodied relationality with the more-than-human" (Hauk 2016: 190; 2014). Another method involves urging students to be barefoot in class so that they can experience space or the ground intimately, and not just as an intangible concept "out there" (Garrard 2010).

Many scholars have highlighted how experiential pedagogies are useful for spotlighting the real world and the role of affect in facilitating deep learning. Nonetheless, few have outlined how the experiential can be employed to teach students about negotiating complex social networks, gaining procedural knowledge and acquiring "political acumen" (Marouli 2021: 7) in order to (re)experience or reform lived realities. If the challenges associated with sustainability are almost always contested vis-a-vis multiple stakeholders (Papenfuss et al. 2019), then it is imperative that students know how to navigate dynamic power geometries. Place-based community, participatory and/or service learning (pertaining to e.g. organic or guerilla gardening, wild-crafting, the honouring of indigeneous histories) would offer ample opportunities for such an experientially and politically attuned pedagogy.

Technologically-enabled learning

Tech(nologically)-enabled learning or

what Krishnakumaryamma and Venkatasubramanian (2018) call technologically mediated pedagogies in sustainability education is just beginning to take shape, and has developed along two strands. The first strand is arguably grounded in a big-picture view (sometimes on a macro-scale) and involves a quantitative and techno-rationalist approach. Such an approach is characterised by the mobilisation of spatial and/or data visualisation techniques (e.g. Geographical Information Systems, Google Earth), the use of high-tech scientific field equipment (e.g. sensors) as well as modelling software for the purpose of mapping, measuring, planning, and predicting phenomena related to sustainability. The underlying impetus is to gather 'objective' knowledge on various parameters of the environment so that projects committed to sustainable development can be better informed. Transferable 21st century skill sets, which are closely aligned to inquiry-based and field-based learning are honed in the process of doing so, such as data gathering/retrieval, information processing and analysis, as well as drawing logical conclusions.

The second strand of tech-enabled learning is premised on the advent of electronic devices (e.g. laptops, electronic boards, hand-held smart phones) and digitally augmented (pedagogical) tools/platforms (e.g. web-based instructional and computer-assisted problem solving systems, smart phone applications, animations, computer games, social media) mediated by information communications technologies (ICT) that are harnessed for environmental education (including disaster risk reduction education in Japan, see Sakurai and Shaw 2022). Digital tools/platforms like these have seeped into the everyday lives of lay people. In this case, the role of the educator is

perhaps not just about recommending relevant digital tools for teaching/learning but also to inculcate critical digital literacies across multiple media. It has been reported that digital tools/platforms (e.g. personal carbon calculator app, apps for free-cycling items) open up new opportunities for authentic informal learning at one's own timing and convenience (Krishnakumaryamma and Venkatasubramanian 2018).

We posit that the challenge for educators/researchers engaged in both strands of technologically-enabled learning/research would be avoid perpetuating the assumption that complex sustainability-related problems can be (re)solved simply via technological innovation and technical expertise. Attention needs to be paid to how data/knowledge that has been gathered via digital/technical methods exceeds its statistical or scientific dimension, in order to foreground its humanistic aspects, and to directed it towards transformative action.

Concluding thoughts: Sustaining sustainability education?

Despite the predominant view that institutes of higher education are well positioned to tackle sustainability-related challenges vis-a-vis sustainability/environmental education, state agencies and educational institutions are less likely to concede that sustainability education is frequently unable to sustain itself and its objectives for social change. Critical scholars have begun to assert that sustainability as a paradigm for policy has failed spectacularly in light of a neoliberal emphasis on material comfort/prosperity in many places (Foster 2017; Hannis 2017). On the one hand, these scholars have asserted that it is imperative for sustainability education to get individuals to acknowledge the grim reality of a climate

crisis and to act on immediate change. On the other hand, such a prescriptive and coercive slant quells perspective diversity and breeds feelings of defeat.

Meanwhile, these scholars are also pointing out a slippage between the environmentalist/sustainability rhetoric parroted by educators and educational institutions and what happens on the ground, due to varying (e.g. logistical, financial, time) constraints (Vare 2020). Papenfuss et al (2019) note that educational institutions are obliged to spearhead formal (sustainability-related modules) and informal (recycling, food composting programs) modes of sustainability education (see also Corres et al. 2020). Robinson (2004) imagines that the goal would be to transition from a growth economy to that of interconnected sustainable communities (e.g. the Business Alliance for Local Living Economies (BALLE), Eco-Villages, Transition Towns, see also Assadourian 2012 on degrowthing in over-developed countries) but this is unlikely to happen.

Accordingly, the extent to which the desired outcomes of sustainability education can be sustained across space and time (e.g. maintaining low-key sustainable practices post-graduation) remains unclear, especially with respect to overwhelming institutional norms (e.g. the prioritisation of economic profits, Sandri 2022, the lack of time and expertise to tease out the complexity of environmental problems, Lozano et al. 2022; see also Schoolman et al. 2016). Moreover, an outright defiance of neoliberal growthist/consumerist or institutional values may be inimical to one's sense of self-preservation and more research needs to be done on how eco-citizens overcome their fears. Further, professional development for educators, particularly in terms of a critical/transformative pedagogy will also

have to be sustained in order for its political intent to be accomplished over time.

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[i] Systems-thinking competency refers to the "ability to collectively analyze complex systems across different domains (society, environment, economy) and across different scales (local to global), thereby considering cascading effects, inertia, feedback loops and other systemic features related to sustainability issues and sustainability problem-solving frameworks" (Evans 2019: 5527). Anticipatory competency relates to "the ability to collectively analyze, evaluate, and craft rich 'pictures' of the future related to sustainability issues and sustainability problem-solving frameworks" (ibid.).