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Transformation through learning: Education *about, for,* and *as* sustainability

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The United Nations foregrounds education as a means to achieving the Sustainable Development Goals (<https://sdgs.un.org/goals>). In this conceptual paper, we argue education must offer learning that is transformative to better prepare learners to respond to the current global challenges. We argue that the dominant educational approaches fall short of realizing learners' potential for transformation toward sustainability. Focusing on the region of Southeast Asia we draw on educator experiences working with and at the Green School (Indonesia) and United World College (Singapore) to map some of their educational successes and identify some of the key processes and conditions that have contributed to those successes. The potential that exists in the context of independent international schools maybe a relevant factor in their success. We see the lessons that can be learned from these examples as useful in other school contexts. We draw on three sequential pedagogical development phases of learning in engaging with sustainability: namely, Learning *about* Sustainability, Learning *for* Sustainability (LfS), and Learning *as* Sustainability. We argue that the third transformative learning phase, Learning *as* Sustainability (which also incorporates processes of learning *about* and *for* sustainability) offers the best fertile ground for engaging learners as active social change agents within and outside of the learning environment. We see these learning phases as all interconnected, dynamic, and fluid rather than a formulaic progression. This paper contributes to advancing schools toward a perspective on education that reflects an ecological approach toward sustainability and support educators to better integrate education as sustainability in their learning activities. It is worth mentioning that changes in the school that reflect an ecological approach does not guarantee that the experience of the learner will result in transformative Learning *as* Sustainability. Instead, it is our contention that attaining a clear understanding of these learning processes empowers educators to facilitate an environment by identifying and incorporating the necessary conditions required to inspire deep ecological transformation, thus increasing the potential to arrive at Learning *as* Sustainability.

KEYWORDS

education *for* sustainable development (ESD), participatory learning (PL), systems thinking (ST), transformative learning (TL), pedagogical approach, education as sustainability

Introduction

Education *for* Sustainable Development (ESD) is a term that can be traced back to the 1990s as an educational response to the concept of sustainable development, as presented in the Brundtland report produced by the World Commission on Environment and Sustainability (WCED, 1987). Since then, there have emerged different iterations of ESD with varying emphases, including some utilizing alternative titles such as Education *for* Sustainability (EfS) and Learning *for* Sustainability (LfS). Despite the urgency of the growing climate and ecological crises (Almond et al., 2020; Smith, 2020; IPCC, 2022), the literature records limited progress in terms of ESD breaking through into mainstream education (Jucker and Mathar, 2015). This is a relatively new and contested field of education as illustrated by the debate around terminology, which is partly rooted in the choice between sustainable development, as brought to the fore by Brundtland (WCED, 1987) and sustainability, which has a long-established meaning before it has become shorthand for sustaining the living environment of the planet including the social and cultural aspects of the human species. The term sustainable development has been dogged by the criticism that economic development and economic growth is implied by the use of “development” (Jucker, 2014, p. 2), and this criticism has to some extent carried over into ESD. For the purposes of this conceptual paper, we propose to use “sustainability” in relation to the *about*, *for*, and *as* forms of education that we discuss below, while acknowledging, as Jucker (2014) does, that ESD is the most common internationally used acronym in this field.

Education *for* Sustainable Development, EfS, and LfS are all action-oriented approaches to education, labeled as “education *for*.” Herein, we firstly explore the genesis of the education *for* approach and ask whether it is necessary to move beyond ESD, to education *as* sustainability. In doing so we explore the origins of the classification of *about*, *for*, and *as* in education to illustrate what distinguishes the concept of education *as* sustainability. In drawing attention to the importance of education *as* sustainability we aim to expand the debate in the wider education community about the need to go beyond current ESD practices to achieve transformative learning. In the literature much of the debate has been on education *as* sustainability in the higher education sector (Holmberg et al., 2008), this article focuses on moving the debate into the school sector and supporting the theoretical concept with some practical examples. We refer to two schools, which operate as part of private International School organizations, and which have been independently recognized for their commitment to sustainability. These schools are the Green School (Indonesia) and United World College (Singapore). We have chosen to focus on Southeast Asian schools for a number of reasons. As an International School teacher, one of the authors is currently employed by United World College, Singapore (UWC)

and is part of their Service and Sustainable Development department. The author has also worked with the World Wildlife Fund (WWF) to establish Eco Schools in Thailand, is as a Certified Educator with Compass Education, based in Thailand (compasseducation.org) and is active part of a Green Educators network based in the region. This first-hand experience of ESD in Schools in Southeast Asia provides an insight into how ESD might evolve when schools have the autonomy and resources to prioritize sustainability. In addition to this, Singapore provides a notable example of how state-run education can prioritize sustainability and has the potential to influence regional change (Deng and Gopinathan, 2016; Deng, 2019). We are members of the London Regional Center for Expertise (RCE Network, 2022) and all have connections to the EfS MSc degree at London South Bank University, either as tutors, students, or both.

The outcomes from this conceptual paper are limited by the examples drawn from the experience, and geographical location, of the one author rather than a broader criteria-based sample. However, these international school examples, which have attracted independent recognition for their work in sustainability, provide an alternative context to the majority of state-run schools and the possibility of identifying different factors that can facilitate education *as* sustainability. The conceptual model that is presented in this article is a response to the gap between the theories around education and sustainability in the existing literature and the lack of the wide adoption of a form of education that can lead to a transformative step change toward sustainability. The model is based on a re-examination of aspects of the literature, in particular the pedagogical roots of education *about*, *for*, and *as* sustainability. The model is also informed by recognized examples of ESD best practice from international schools in southeast Asia. Thereby linking theory to practice, which has always been a central tenet of the EfS MSc degree at London South Bank University.

The emergence of *about*, *for*, and *as* in the literature

That elusive paradigm where education has merged seamlessly with sustainability, where all learning is viewed through the lens of sustainable development, and where all education is seen *as* sustainability, has only been glimpsed in certain contexts and has never broken through as the dominant paradigm in mainstream education. While there have been top-down political and structural barriers to change in the direction of sustainability, it has been at the school and classroom levels where examples of ESD have been successful, often due to the drive of individuals, but these are sometimes short-lived if the personnel involved change school. These examples are characterized by the pedagogy that is associated with ESD. Pedagogical approaches have been a defining characteristic of ESD (Strachan, 2012), for example, participatory activities,

questioning, critical thinking, outdoor learning, and trans-disciplinary learning. This approach to learning is captured within Sterling's ecological view of education as juxtaposed to what was, and in many cases still is, a more traditional mechanistic view (Sterling, 2001).

These pedagogical approaches did not suddenly appear with the emergence of ESD; they were drawn from existing educational traditions, most notably environmental education. Development education in the post-colonial era in former European imperial powers has also been influential, as manifested by the network of development education centers in the UK (see the Consortium of Development Education Centers, www.codec.org.uk), promoting learning that was supported by resources most notably from NGOs such as Oxfam Education and Action Aid and the multi-stakeholder global networks of Regional Centers of Expertise (RCEs) on ESD. The pedagogical implications of the relationships between education and the environment, and education and development cast light on how ESD (as well as EfS and LfS) adopted the approach of "education for."

A key text in analyzing the relationship between education and the environment is *Environment and Environmental Education: Conceptual Issues and Curriculum Implications* by A. M. Lucas, published in 1979. Lucas developed a typology for classifying environmental education as follows:

The label "environmental education" makes literal sense when applied to a number of different classes of educative programmes. It can refer to education *about* the environment, *for* the (preservation of the) environment or *in* the environment. Combinations of any two or all three of these possibilities are also sensible (sic, Lucas, 1979, p. 50).

Typologies of this nature raise many questions, such as: are the categories independent or connected? Are they hierarchical? Are they part of a continuous process? Do they signify different types of pedagogy and learning? Lucas (1979) explored many of these questions, with the debates he generated enduring in subsequent years, including how to understand the relationship between education and sustainable development.

Lucas explores each "class" of environmental education in his typology in some depth. The objectives of education *about* the environment are "clearly cognitive" according to Lucas, but he did not see it as merely a process of learning and recalling knowledge. In this class of environmental education students may also be expected to comprehend, interpret, analyze, and synthesize aspects of the environment and environmental data. Education *about* the environment does not imply that there is already a complete understanding. On the contrary, within the scope of education *about* the environment, students should be taught the skills for gaining and extending environmental data and knowledge. This perception of "education *about*" can be seen within ESD in the concept of knowledge being emergent and,

as a result, the continual re-evaluation of what may be considered sustainable.

Whilst the goal of education *about* the environment is a knowledgeable individual, the aim of education *for* the environment is "to assist the preservation or improvement of the environment for a purpose" (Lucas, 1979, p. 52). The following quotation illustrates how Lucas saw attitudes incorporated into education *for* the environment: "Typical programmes *for* the environment will attempt to inculcate attitudes of concern for the features of the environment that enhance the chances of continued human life . . ." (sic, Lucas, 1979, p. 52). Lucas looks for linkages between knowledge, attitudes, and action, finding that in the environmental education literature of the time: "Almost invariably, "attitude" denotes, or at least connotes, "a predisposition to act"" (Lucas, 1979, p. 52). This is something which he goes on to critically review while exploring the knowledge-action gap. In doing so Lucas makes a connection between "education *about*" and "education *for*," raising the debate about the extent to which knowledge is a necessary element of the attitudinal and action components inherent in "education *for*." This debate has continued through to the current discourse around competences for ESD (Rieckmann, 2018).

Education *in* the environment was identified by Lucas as a particular pedagogical approach associated with learning taking place outside the classroom, a characteristic that has persisted into ESD. For Lucas education *in* the environment is conceptually different to the goal oriented *about* and *for* the environment. Focusing on educational goals such as developing citizens who are knowledgeable about the environment or developing active citizens who preserve (or nowadays restore) the environment led Lucas to analyze the potential linkages between knowledge, attitudes, and action. He went on to critically review a range of models that attempt to cast light on the relationships between knowledge, attitudes, and action, without finding evidence of causal connections. His position is best summarized as follows.

Environmental education programmes should be "education *about* and education *for* the environment," with a heavy emphasis on education *for* the environment. The education *about* the environment component act as vehicles for the needed knowledge "that" and knowledge "how" that are essential prerequisites for effective action. However, existing models connecting knowledge, attitudes, and environmental actions do not imply necessary connections. Attitudes do not entail knowledge, knowledge does not entail attitude formation of a particular type, and neither knowledge nor attitude entail particular actions (sic, Lucas, 1979, p. 87).

The potential addition to the typology of "education *as*" raises the possibility of extending the understanding of links between education and change and exploring why the knowledge-action gap is still seen as a barrier to change and remains as a subject of debate (Maiteny, 2002).

Downs (1993) included “education *as*” in the typology he developed for analyzing development education. While there is no single encompassing definition of development education, its aims are to raise awareness and understanding of global issues, and it is now more commonly referred to as global learning or education for global citizenship (see: www.codec.org.uk/global-learning/what-is-global-learning/). The pedagogy associated with development education is characterized by active and participatory learning, equality, cooperation, and inclusion.

Downs’ typology has three categories that consider education as being *about*, *for*, and *as* development, and like Lucas, he sees these approaches to education as being interrelated in achieving specific outcomes. For Downs education *about* development falls short of nurturing critical thinking concerning the causes and systems that lead to and maintain global inequalities. Although acquiring a good basis of knowledge is important, this approach does not mobilize the learner into action. Education *for* development encourages the learner to take action to contribute to some level of change after having acquired knowledge and learning, but, according to Downs, the extent of any change of attitude is “spasmodic” and “moderate” (p. 6). However, education *as* development is likely to achieve a “deep” change in attitude, thus forging a long-term synthesis between this type of development education and action (Downs, 1993). It is education *as* development that has the maximum potential for transformation and long-term impact on learners in their engagement with global development issues. This conceptualization of education offers a basis for exploring the potential use of “education *as*” in and beyond the context of ESD.

Simple typological models of education are helpful in categorizing examples of education, but both Lucas and Downs recognized the limitations of typologies, hinting at the complexity underlying these models by recognizing that the relationships between the different types within the models are as important as the types themselves. The concept of transformative learning, which is often referenced in relation to ESD, can be seen as an example of how *about*, *for*, and *as* are interdependent, particularly in the relationship between *for* and *as* sustainability.

Transformative learning is defined as a process which nurtures a deep structural shift, but also implies there is a shift in consciousness in both the inner and outer dimensions (O’Sullivan et al., 2002). Although Sterling (2011) charts the historical landscape of transformative learning and its relevance to ESD, there emerges two important questions; What are the prerequisites in the learning experience for transformative learning to potentially occur? What roles do education *about* and *for* sustainability play in transformative learning that leads to education *as* sustainability? While education *as* sustainability does not guarantee transformative outcomes, there appear to be certain pedagogical approaches, which are not exclusive to education *as*, that can contribute

to transformative learning: for instance, relevant knowledge, awareness of alternative perspectives, learning in small groups, learning that is facilitated through intensive residencies, and learning in a conducive environment that reflects what is being taught (Sterling and Baines, 2002). Additionally, engaging in learning that leads to third order change, as described by Bateson (1972), would not only require learners to be prepared for the difficulties and emotional revelations that potentially lie ahead, as the practice of reflexivity is intrinsic to transformative learning, but also to the need for learners to have access to support if required. Boström et al. (2018) and Singer-Brodowski et al. (2022) identify similar requirements for transformative learning in the context of higher education.

In a narrative approach to her own teaching and learning journey O’Neil (2018) brings together transformative learning and sustainability education to suggest a more “relational and interconnected way of being in the world” (O’Neil, 2018, p. 368). O’Neil presents a progressive model that links *about*, *for*, and *as* with the three orders of change described by Bateson (1972) and developed further in terms of levels of learning by Sterling (2011). Education *as* sustainability is a transformational step from education *about* and *for*, it is a third order change resulting in an ontological shift that “...allows us to cocreate ourselves at the experiential level” (O’Neil, 2018, p. 372). This view of education *as* sustainability finds a degree of synergy with Foster (2001), who in a paper on EfS in higher education discussed deepening the meaning of the concept “towards something more experiential, something more like an ongoing individual and collective habit of attention to time and change within the natural order...” (Foster, 2001, p. 156). The depth and complexity of education *as* sustainability is also revealed in a model presented by Scott and Vare (2007).

Scott and Vare (2007) provide an insight into the complexity and interdependent levels of ESD in their paper *Learning for Change: Exploring the relationship between education and sustainable development*, wherein they introduce the concepts of ESD 1 and ESD 2. ESD 1 approaches can be summarized in terms of cause-and-effect type learning, where the solutions can be identified, agreed, and measured. Learners are taught about issues of sustainable development in order to change behaviors for more sustainable futures. In an ESD 1 approach learners consider, “how to do things differently and more efficiently,” in order to encourage more sustainable behaviors and practices. ESD 1 fits into more traditional models of education, starting with knowledge building and expert facilitators guiding the learning down a particular path. Scott and Vare (2007) explain that this is an appropriate approach for certain types of sustainability problems. They use the idea of reducing waste and saving energy as examples of behavioral change that can be brought about through an ESD 1 approach. However, ESD 1 falls short when faced with the kinds of complex and wicked problems that characterize many of the systemic issues surrounding sustainability.

ESD 2 can be characterized as a critical thinking approach, which goes beyond the expert-knowledge approach seen in ESD 1. As a result, ESD 2 has the potential for deeper behavioral change and learning. Unlike ESD 1 approaches, ESD 2 does not attempt to measure or quantify outcomes, but instead focuses on the ongoing learning process. The ability to critically analyze, question, and negotiate are central to the ESD 2 approach and, therefore, learners become active participants in ESD. ESD 2 is necessary to address the complex problems in sustainable development in a way that ESD 1 cannot.

Scott and Vare present ESD 1 and ESD 2 in terms of the Chinese concept of Yin and Yang, where Yin cannot exist without Yang and vice versa. This is the key to understanding the complexity of the model, and although Scott and Vare refer to ESD 1 as education *for* and ESD 2 as education *as*, because they are so interrelated and dependent on each other the whole model can be seen as education *as* sustainable development. In the same way, education *as* sustainability can be viewed as an interdependent whole incorporating education *about* and *for* sustainability. Education *as* sustainability shows how the pedagogy around this kind of learning must consider and include multiple approaches. The learning is not necessarily linear, or even directional, as one approach feeds into, and results in, the other. Learning facilitators must understand this dance and plan accordingly, demonstrating “openness to the unplanned directions that learners take,” as highlighted by Scott and Vare (2007, p. 5). Education *as* sustainability, when viewed from a complex, interrelated ecological perspective, demands mixed pedagogical approaches, and multi-directional processes.

Implications of *about*, *for*, and *as* in the international school classroom

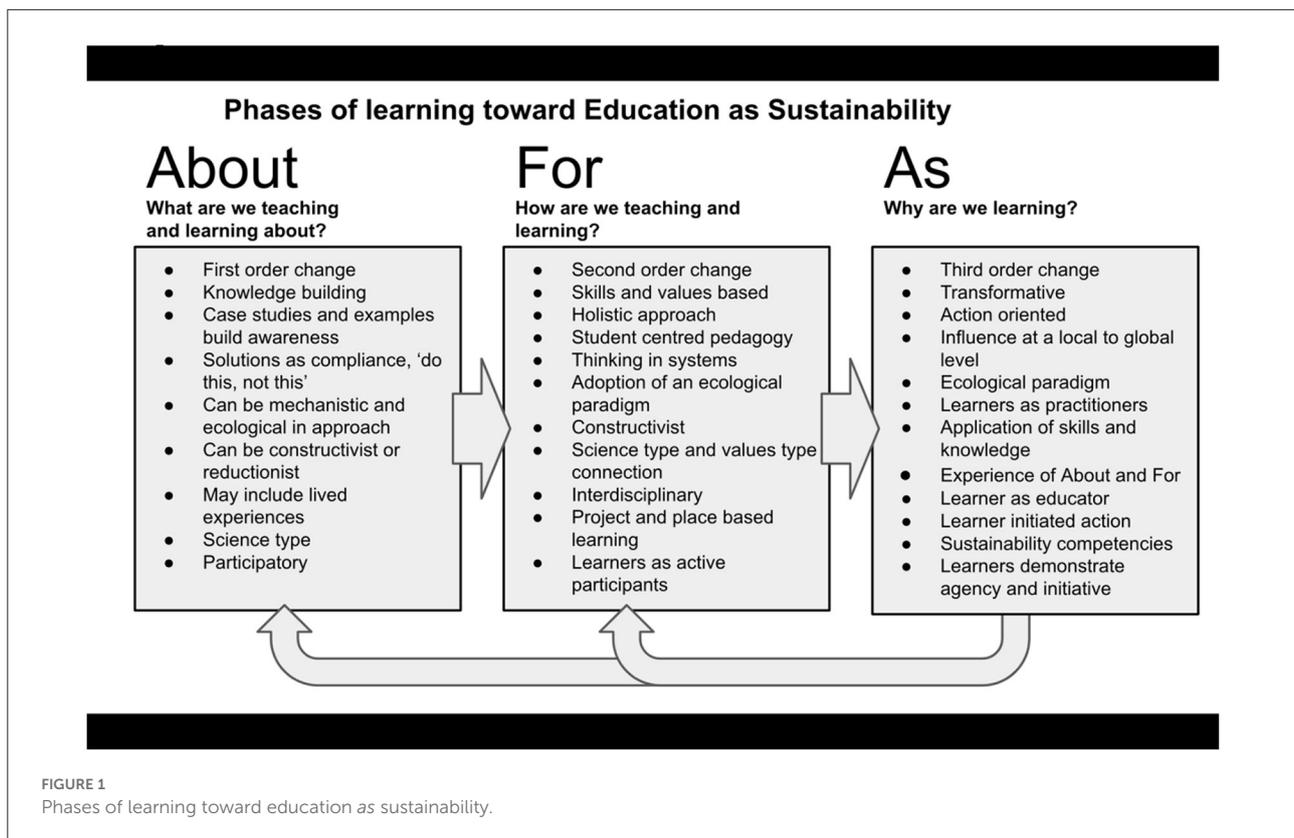
Drawing on case study examples of private international schools in southeast Asia, we begin to look practically at how education *as* sustainability might develop and be applied. All three phases of learning, *about*, *for*, and *as*, are important to transformational change and the lack of achieving a transformative approach can be due to a lack of emphasis on one or more of the three elements. As with Scott and Vare's (2007) model of ESD 1 and ESD 2, these different approaches to ESD are not a case of either/or, but rather equally important parts of a learning process. Moving through the *about*, *for*, and *as* phases of the learning process is not necessarily directional, nor is there a clear starting point. Instead, we see a process that has three layers of learning that complement, overlap, and feed into each other. In many ways, considering the *about*, *for*, and *as* phases of learning in terms of day-to-day classroom practice provides some clarity as to what education *as* sustainability means for a classroom teacher. Translating the learning process in simple terms, the *about* phase relates to content and curriculum, the *for* phase highlights the important role of the pedagogical approach,

and the *as* phase links intention and values to practice and behavioral change as a culmination of all three phases.

Figure 1 summarizes our model and highlights some of the key features of the *about*, *for*, and *as* phases of learning, drawing on the literature previously highlighted. The initial idea for a model with phases of learning was inspired by the typologies discussed earlier in this paper from Lucas (1979) and Downs (1993), although they do not correspond directly to either of their classifications. The model integrates aspects of the debates around the characteristics of ESD including the role of transformative learning and draws on the concept of education *as* sustainability raised by Scott and Vare (2007). Practical classroom observations further shaped our thinking behind the model, in that we wanted to empower teachers, who are often time and resource poor, to better understand the pedagogical shifts between the phases of learning and develop their professional practice. To move this from theory to practice, a programme of continual professional development (CPD) for teachers that is based on understanding the changes in pedagogy through the phases illustrated in the model can further support the transition practically toward education *as* sustainability in the classroom.

We suggest that in order to arrive at a point of education *as* sustainability it requires all three phases. Education *as* sustainability cannot exist without the prior two phases. As referenced above, O'Neil (2018) provides a model that outlines the relationship between first, second, and third order change and *about*, *for*, and *as*, in higher education. This is something that we also acknowledge and include in our model, although our central focus is primary and secondary schools. However, we feel that it is important to emphasize that *about*, *for*, and *as* is neither linear nor hierarchical, but necessary phases toward and within education *as* sustainability. Inspired by Scott and Vare (2007) and their model of a Yin Yang representing ESD 1 and 2, this model gives equal importance to the *about*, *for*, and *as* phases of learning.

The aim of this model is to identify practical application of the *about*, *for*, and *as* phases of learning and allow educators to identify and plan for each as part of an overall approach to education *as* sustainability. The model can be seen in terms of simplified practical steps, especially when considering how education *as* sustainability might develop beyond individual examples at teacher and school levels and begin to have significant impact on a regional scale. This simplification also serves to translate education *as* sustainability in practice to teachers who work within pedagogical and content specific frameworks and overcomes some of the ambiguities of what embedding sustainability means in practice. By addressing the phases of learning associated with education *as* sustainability in this way, we can identify encouraging examples of good practice in each area. Whilst there are individual examples of *about*, *for*, and *as* taking place in schools, there appears to be significantly fewer examples



of all three phases that are fully integrated and taking place concurrently.

About

As we look at what has been referred to as education *about* sustainability, it is important to consider what this might mean in practice at school level. With this in mind, we can think about this phase as the “what” in learning, that is to say, what teachers are teaching and what learners are learning. As such, we consider this phase to be largely content driven and knowledge-based learning around sustainability.

Content and resources relating to sustainable development are widespread and expanding daily, thanks largely to the internet and the growing number of organizations that have identified education as key to behavioral change and sustainable futures. Teaching *about* sustainable development is the first step toward education *as* sustainability and a necessary stage through which students can build their understanding of the world and the challenges of sustainability, before they begin to work through the *for* phase of education *as* sustainability. This is perhaps the easiest phase of this journey for teachers to apply, as it fits within even the most mechanistic of models. Education *about* sustainability can essentially exist as a form of information

delivery, but within the context of sustainable development. Scott and Vare (2007) identify this kind of information and content-based approach as a vital part of ESD learning. Relevant and high-quality resources that support the *about* phase of ESD have been easily accessible to teachers and schools for some time, regardless of national curriculum or state affiliation.

The World Wildlife Fund (WWF), for example, has provided an abundance of quality content and learning resources for decades (www.worldwildlife.org/teaching-resources), including developing a systems perspective through resources such as “Linking Thinking: New Perspectives on Thinking and Learning for Sustainability” (Sterling et al., 2003). The nature of the WWF global operation means that the educational content provided is both regionally focused and aimed at complementing that of various local curricula in the countries that they serve. For example, WWF Thailand offers a variety of quality resources and case studies based in Vietnam on their Mekong Delta, tiger conservation, and elephant poaching projects, among others, as well as supporting and facilitating the Eco Schools programme for Thailand (https://www.wwf.or.th/en/project_in_thailand/eco_schools_programme/). Whilst the work of the WWF is most certainly not limited to the *about* phase of LfS, the broadest reach of their work is in this phase. The WWF utilizes several platforms to share their learning content and resources, perhaps most notably a recent

collaboration with Netflix (online streaming service) in making the series “Our Planet” (<https://www.worldwildlife.org/pages/our-planet>), with the accompanying educational resources introducing issues relating to sustainable development to a wider audience than ever before.

Whilst the context of sustainability in education is a natural starting point for educators with sustainability mindsets, education *about* sustainability that is integrated into the learning journey of the student may not occur, even if it is written into curricula. Unless curriculum guidance is explicit about the inter-related nature of *about*, *for*, and *as*, there is always the danger that education *about* sustainability will be an isolated “bolt-on,” and it will never take students through the *for* phase to the transformative *as* phase. In the same way that ESD 1 supports and feeds into ESD 2 (Scott and Vare, 2007), it may be that more explicit curriculum guidance necessary to engage students, and most importantly teachers, in the development of education *as* sustainability at a regional level, rather than solely on a school-by-school and teacher-by-teacher basis.

For

Moving beyond the *about* phase, we can begin to think about how educators can move toward educating *for* sustainability. How might teachers equip students with the necessary skills and attributes to make change and move us toward sustainability? There is a need to consider a holistic and critical approach when teaching *for* sustainability. Scott and Vare (2007) would refer to this as part of ESD 2, the point at which we move beyond simple knowledge and information and begin to make new meaning and ask critical questions.

Many of the approaches that complement ESD are becoming increasingly common in mainstream schools. Claxton (2021) highlights how student-centered pedagogies are becoming more popular in the post-internet age, where dispositions and so-called soft skills are replacing knowledge and skills as primary requirements in the future world of work. Schools are working to align themselves with future-oriented educational approaches, such as those suggested by the intergovernmental organization the OECD (2018). Sterling (2001), for example, provided a model that he refers to as an ecological paradigm (p. 58–9) in education, where he goes into detail about the types of practices and approaches to learning that are conducive to Efs. Here, he outlines approaches to teaching and learning that seem strongly aligned with many of the modern, progressive, student-centered models of education that are being adopted by many schools throughout the world, thanks in large part to international bodies such as the OECD. More recently, guidance from UNESCO (2021) has also suggested pedagogy that could be considered as in line with ESD. The “Reimagining our futures together: A new social contract for education” document (UNESCO, 2021) specifically outlines teaching for conceptual

understanding, problem-based and project-based learning, and student agency as examples of practice that supports students to realize their sustainable futures (Lucas, 1979, p. 51). We argue that this is taking learning into the phase of education *as* sustainability.

Student-centered approaches to teaching and learning provide opportunities for students to develop the necessary skills and dispositions required to educate *for* sustainability. US based website www.edutopia.org, part of the George Lucas Foundation, for example provides teachers with short articles and guidance for teaching and learning that support student-centered pedagogy including project-based learning, diversity, equity, and inclusion, social, and emotional learning. This is one example of how student-centered pedagogy is becoming more and more prominent, even in mainstream western education systems. This moves us away from what Sterling (2001) would consider mechanistic pedagogies, and toward more progressive ecological approaches to education. Essentially, combining pedagogical approaches that emphasize critical thought, empathy, and equity, with teaching *about* sustainability, we can begin to deliver the necessary skills and dispositions *for* sustainability.

Although many advocates of student-centered education are not necessarily based in ESD, there are some that provide teaching and learning tools specifically designed to support critical thinking and ESD. Compass Education (compasseducation.org) for example is a not-for-profit educational organization that provides courses and training based on systems thinking and ESD. Unlike many other ESD-based organizations, Compass Education does not provide content, but is based on approaches to teaching and learning, providing tools that support pedagogy around ESD. The Compass tools (www.compasseducation.org/the-compass-education-toolkit/) are in use in schools worldwide, although they are predominantly used in private international schools, where their tools complement the International Baccalaureate (2022), with its strong emphasis on inquiry, international awareness, service learning, and student agency.

As

The development of sustainability related content and the student-centered pedagogy required for ESD are perhaps more prominent than ever before. And yet, the impact of ESD at a regional level remains limited (Sterling, 2021). Education *as* sustainability is alluded to by authors such as Scott and Vare’s (2007), but this transformative phase of learning leading to an ontological shift as described by O’Neil (2018) requires greater exploration in its practical application for schools.

The *as* phase of learning involves the application and embedding of the knowledge, skills, and dispositions that have

been established during the *about* and *for* phases of learning. This is where students are supported through third order change and develop the ability for the continuous re-assessment of values and worldview in relation to sustainability. However, this all important *as* phase cannot take place without the establishment of the knowledge and skills (*about* and *for*). For example, this might be the difference between students participating in a one-off beach clean-up, as part of a compulsory “service” activity, or instigating and developing regular beach clean-up operations, based on their understanding of the impact of plastic pollution on marine life in their region. There is an acknowledgment of this need to move beyond knowledge and skills in guiding documents produced by influential intergovernmental organizations such as the Organization for Economic Cooperation and Development (OECD). In their 2018 position paper *The future of education and skills Education 2030* they highlight the need for young people to be educated beyond just knowledge and skills and toward what they refer to as competencies.

“The concept of competency implies more than just the acquisition of knowledge and skills; it involves the mobilisation of knowledge, skills, attitudes and values to meet complex demands” (OECD, 2018).

The OECD identifies how this is important in overcoming the environmental, economic, and social challenges of the future. In addition to the acknowledgment of competencies in the mainstream, there have also been numerous attempts to articulate sustainability specific competencies and what this could mean in ESD. Wiek et al. (2011) and Rieckmann (2018) for example, provide in depth analysis of sustainability competencies and how this relates to ESD. This could be seen as complimentary to education *as* sustainability, where sustainability competencies, agency, and values can be developed and applied, in addition to the knowledge and skills developed through the *about* and *for* phases.

Although we feel that the *as* phase requires more attention, it is important to note that the education *as* sustainability is being achieved in some cases. Many international schools place a strong emphasis on service learning as part of their compulsory educational programme, for example. However, the same expectations are less prominent in state run education, where national curricula and standardized testing takes priority. Despite this, there are several extracurricular programmes and initiatives that have been successful in involving state schools in educating *about*, *for*, and even *as* sustainability, perhaps most notably the Eco Schools programme. This model operates in addition to a school’s curriculum and is often made up of smaller groups of children who carry out school-wide activities and campaigns to transform their school into a more sustainable community. The Eco Schools programme encourages student-led projects and is based on action rather than content-based learning. As such, Eco Schools, and similar action-oriented programmes, such as Healthy Schools, Rights

Respecting Schools, and so on, offer a potential steppingstone from education *about* and *for*, to education *as* sustainability.

However, due to the extracurricular nature of these programmes, there are some clear limitations as to their potential impact on a regional scale. Firstly, the number of students taking an active part in an Eco Schools programme (or similar) is often only a fraction of the overall student body and limited to those willing to give up lunchtime or break times, or to stay after school. Secondly, these programmes are usually run by one or two enthusiastic teachers, rather than operating at a systemic level or as a compulsory part of a school’s learning programme. As such, once these individuals move on from a particular school, their Eco Schools efforts may move with them.

The Eco Schools programme, and similar initiatives, could also be examples of where schools might attempt to deliver the *as* phase of learning without the necessary depth of knowledge, skills, and perspectives provided by thorough *about* and *for* learning. Whilst action-oriented groups such as this could be examples of education *as* sustainability, all three phases must be in place as an ongoing process for the learning to be transformative. To do this, we argue that schools must prioritize sustainability as a context and a driving motivation behind their learning and pedagogy. Rich sustainability-oriented content and progressive pedagogy must be in place, in addition extracurricular programmes, such as Eco Schools, can provide opportunities for student led initiatives and learner agency.

What we also see as we reach the education *as* sustainability phase of learning is the potential for education *as* sustainability to feedback into the *about* and *as* phases of learning. This can happen where learners approach new areas and aspects of sustainability and therefore need to build new knowledge and skills before they return to the education *as* sustainability phase, where action is taken. The *as* may also feed into *about* and *for* as learners become educators, share their learning and act toward influencing their peers or community. The process of learning *about* an issue, developing critical thinking and different perspectives, and then teaching and raising further awareness of an issue, can be seen as an important aspect of education *as* sustainability. While education *as* sustainability can be seen as a desired state, it is not a stand-alone phase of learning. Rather, education *as* sustainability is dependent on, and contributing to, the *about* and *for* phases of learning.

The International Baccalaureate (2022) is an additional factor that many International Schools can use to support education *as* sustainability. The International Baccalaureate, a not-for-profit organization provides curriculum and pedagogical guidance for more than 5,000 schools worldwide. Its driving purpose is “Education for a Better World,” and service learning is a compulsory element (www.ibo.org/programmes/diploma-programme/curriculum/creativity-activity-and-service/cas-projects/). The combination of progressive pedagogy and service-oriented curriculum provides

an established base for the development for all three phases of education *as* sustainability.

Singapore provides an example of a state government that has issued guidance that prioritizes sustainability in a way that could promote education *as* sustainability. For example, the main “aim and outcome” of the lower secondary geography curriculum for Singapore is to, “promote students’ growth as informed and concerned citizens who are able to use geographical knowledge and skills to show care and concern for the world they live in and actively contribute toward a sustainable future” (Ministry of Education for Singapore, 2021). From here, content, resources, and pedagogy can be clearly established within the context of the explicitly sustainability-oriented purpose of learning. Essentially, by providing a clear “why,” the education *about* and *for* can more easily be supported, and the likelihood of reaching a state of *as* is significantly increased. This could go some way toward explaining why Singapore is quickly becoming something of a hub for innovation for sustainability in the region, as demonstrated by the Sustainable Singapore Blueprint (Sustainable Singapore, 2021; <https://www.clc.gov.sg/docs/default-source/books/ssbcombined-cover-text.pdf>).

Illustrative examples of what education as sustainability might look like

The examples are drawn from private international schools in Southeast Asia, which belong to organizations that have global networks of schools, where limiting factors such as national curricular and a lack of funding are less of a restriction compared to state run systems. One school is part of the UWC movement (www.uwc.org/schools) and one is part of the Green Schools group (<https://www.greenschool.org/about-us/>). Both schools have been recognized for their work in sustainability education and have notable alumni working in the field of sustainable development, who could be considered products of effective education *as* sustainability (www.uwcsea.edu.sg/mystory). The UWC movement has been nominated for a Noble Peace Prize (<https://uwcisak.jp/news-events/uwc-movement-nominated-for-the-nobel-peace-prize/>), and Green School Bali has been named in the top 10 shortlist for the World’s Best School Prize 2022, for Environmental Action (<http://www.greenschool.org/insights/best-school-prize/>).

United World College Singapore and the Green School Bali are overtly mission driven including a strong focus on sustainability. In each case there is a clear sustainability oriented “why” behind their education programme and pedagogy. This paper argues that this clear “why” behind education is necessary for education *as* sustainability in schools, because it provides clear direction and motivation for action and the application of

skills and qualities instilled during the *about* and *for* phases of education *as* sustainability.

The UWC’s nomination for a Nobel Peace Prize is based on their work in sustainability and peace-based education. The school’s mission is to make “education as a force to unite people, places, and culture, for peace and sustainable future,” which leaves no doubt as to the purpose of their educational programme, and the school’s systems and structure reflect this (www.uwc.org/educationalmodel). The school provides a holistic learning programme focused on addressing its mission and invests significant efforts in embedding ESD into its curriculum. United World College schools are International Baccalaureate world schools and the UWC organization played a significant part in the development of the International Baccalaureate (2022), where, as mentioned previously, “service learning” plays a large part. Furthermore, the southeast Asian branch of UWC (UWCSEA) has developed its own curriculum for primary and middle years, which goes beyond the guidance offered by the International Baccalaureate organization, embedding ESD and its related pedagogy deeper into the learning programme. The bespoke curriculum emphasizes skills such as systems thinking and environmental stewardships, for students as young as 5, and includes this as part of the compulsory learning programme. UWCSEA also includes “mission competencies” as part of its desired outcomes for graduates, in addition to the academic success that the school is known for (www.uwcsea.edu.sg/). In his recent book *The Future of Education*, Claxton (2021) lists UWCSEA as an example of a school that offers a rich progressive education, in conjunction with academic rigor and attainment.

The defining mission of UWC schools means that pedagogical practices are also in place to support the development of skills and understandings as outlined in the curriculum. Concept-based teaching and learning, inquiry based practices and interdisciplinary teaching and learning are present in the schools, as are more specific teaching and learning tools, such as those provided by Compass Education and the Ellen Macarthur Foundation (www.uwc.org/educationalmodel). The school not only provides education *about* and *for*, through academic study, but also supports the development of education *as* sustainability, through action and application. The East campus, which is home to around 2,500 students, has a department of nine staff devoted to “Service and Sustainable Development,” where students are supported through service and action projects as a compulsory part of their learning. These service programmes start for students at the age of five, where they are guided through work with local and international service partnerships as well as schoolwide environmental initiatives, such as Eco Schools. Eventually students follow their own areas of interest, with each taking part in student-led action groups, such as “marine conservation,” “rainforest restoration,” and “initiatives for peace.” Furthermore, the East Campus is an award-winning eco-campus, with a facilities team that

includes a “head of sustainability.” As such it provides a learning environment that demonstrates the values being taught. This explicit guidance at mission level acts as something of a cascade throughout the school, informing the written curriculum, pedagogy, practice, and eventually behaviors. Education *for* Sustainable Development at any level in the school is not based on individuals driving things or resorting to a “bolt-on” style approach to ESD. The school has systems that support *about* and *for* phases of ESD and advances toward the education *as* sustainability phase.

The Green School in Bali demonstrates similar mission driven, ESD and education *as* sustainability practices to UWCSEA. Green School is another high-profile group, with schools in Bali, New Zealand, South Africa, and Mexico, offering high levels of transformative learning, according to a 2020 report by the World Economic Forum (WEF, 2020). Green School’s stated mission is to “create a global community of learners making our world sustainable.” The original Bali school is perhaps best known for its impressive bamboo structure, and has also received praise for its students Melati and Isabel Wijsen, who managed to successfully advocate for the removal of all plastic bags on the island of Bali, whilst studying at the Green school (<https://www.greenschool.org/bali/bnmag/life-at-gs/bye-bye-plastic-bags/>). The actions and commitment of Melati and Isabel Wijsen could certainly fit with our definition of education *as* sustainability. However, this success may be based on the fact that the school provides familiar and more replicable examples of education *about* and *for* sustainability. The school has significant outdoor learning spaces, where study of nature forms a strong part of their bespoke curriculum. They also use pedagogical approaches, such as inquiry-based learning, project-based learning, and interdisciplinary learning, that support development toward education *as* sustainability. On a recent visit to the Green School Bali, one of the authors saw several environmental projects that had been initiated by students of all ages including a chicken coop project, pond project, ocean advocate organization, and a fair-trade coffee company. Despite being an international school, the school remains connected to the local culture, and indigenous learning is evident throughout their programme, as are modern approaches such as the integration of the Sustainable Development Goals and systems thinking tools. Pedagogical approaches outlined by Sterling in his model of ecological education, and more recently highlighted by UNESCO (2021) in their Reimagined Futures documentation, can be seen in both the United World College Schools and Green Schools.

A strong mission alignment in these two schools means that sustainable development as a context for learning is clear and explicit to all. Essentially, the mission and structure of a school cascades down to inform the delivery of education *about* and *for* sustainability, which in turn feeds into the *as* phase, where students begin to experience what it means to be agents of change. Considering the availability of content, pedagogy, and

models of action that are available to all schools, it seems as though a lack of clarity on the “why” behind education is one of the reasons for less examples of education *as* sustainability in mainstream education.

However, as noted earlier both UWC and Green School are private education establishments, and most students are paying significant fees to attend. With this comes autonomy for the schools to establish their own mission and ethos and adopt practices that fulfill the phases of education *about*, *for*, and *as* sustainability, with strong mission alignments, and systems, facilities, and structures in place to support such learning. When schools have more freedom to select or create their own curriculum it seems as though there is greater potential for education *as* sustainability to take place. The written curriculum that a school adopts can have a direct influence, at least in terms of content, on education *about* sustainability, which delivered in the context of the school’s ethos, can then lead to the development of education *for* and to education *as* sustainability. By following the International Baccalaureate curriculum, as many international schools do, there are explicit requirements for Learning *about* Sustainability in the written curriculum (*about*), guidance on the types of student-centered pedagogy being used (*for*), and expectations around student-led service and actions (*as*). Of course, not all schools following the International Baccalaureate are models of education *as* sustainability but compared to the majority on non-International Baccalaureate schools, the structures are in place to support the three phases of education in relation to sustainability. While our examples are focused on Southeast Asia, we recognize that there is a diversity of cultural, geographical, political, and economic contexts that may influence the practical application of the model put forward in this paper. The next phase of the research would be to test the model in different contexts.

Conclusion

The concept of a fully integrated education *as* sustainability, encompasses education *about* and *for* sustainability, which stretch back further than the emergence of ESD, and have a particular indebtedness to pedagogical approaches rooted in environmental education and development education. To address the lack of progress in mainstream education toward transformative learning and third order change associated with education *as* sustainability, there needs to be greater focus on the practical application of education *as* sustainability, beyond the current practice associated with ESD. By looking at examples from international schools, where some of the barriers that exist in mainstream state schools have been removed, it can provide indications of the changes that are needed in national systems or at a regional level.

We have considered how similar mission style approaches to education in international schools following the International Baccalaureate might be applied on a broader scale. In some instances, we see that attaching a clear, sustainability focused, mission underpinning written curricula can work at both state and national levels, as in the case of Singapore. If other state mandated curricula carried a similar driving mission, or “why,” behind the learning, the potential for education *as* sustainability to take place on a regional scale would be greatly increased. However, this message cannot come from individual teachers, or even school leaders, if there is to be impact at a regional level. As Claxton (2021) explains, society doesn’t reflect education, as one might hope, rather education reflects society. As such, the importance of a guiding “why,” which reflects a societal inclination for sustainable futures, cannot be overstated. International schools have the freedom to establish their own mission and to determine their content, pedagogy, and the application of resources to achieve that mission. Where schools such as UWC and Green School have aligned their missions to sustainability, they have provided a clear “why” for developing content, resources, and pedagogies that support education *about* and *for* sustainability. Leading to a significant likelihood of reaching a state of education *as* sustainability.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

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