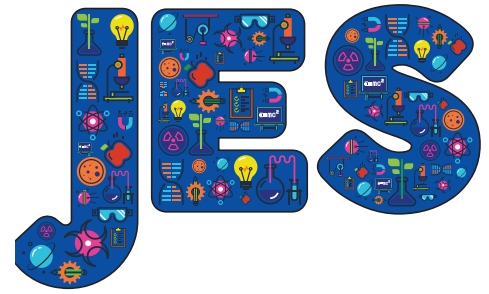


# Educating for sustainability



● Andy Markwick

## Abstract

*This article reconceptualises sustainability as being built upon a foundation of environmental consciousness and understanding. It explores the current thinking around education for sustainability to offer an alternative curriculum view: a view where sustainability permeates throughout the primary curriculum and is driven by pedagogies that offer children opportunities to grow their confidence, challenge ideas and offer solutions to the local, national and, ultimately, global problems they will face through their lifetime. By increasing children's sustainability capital and their agency towards these challenges, we can reduce eco-anxiety.*

**Keywords:** Sustainability, environmental consciousness, curriculum, pedagogy, eco-anxiety

## Introduction

The world faces many complex and non-linear anthropomorphic sustainability challenges, which are now only beginning to be understood, and with a greater recognition that considerable and immediate change in the ways in which we interact with our environments is required (Kioupi & Voulvoulis, 2019). World governments are making high profile decisions to address the severe global issues that we are all facing. UNESCO (2017, 2019) have presented 17 agreed areas of focus termed Sustainability Development Goals (SDGs), summarised in Table 1.

It may also be beneficial to revisit *The Earth Charter* (2000), which was the outcome from the 1992 Earth Summit in Rio de Janeiro. The charter promotes the following themes:

- Respect and care for our communities of life
- Ecological integrity
- Social and economic justice
- Democracy, non-violence and peace.

It would be very hard to argue against any of these requests and, indeed, we might consider using these themes to restructure education.

Without question, children have a vested interest in decisions being made now, as these will undoubtedly influence their lives substantially more than those who have made the decisions, and so it is imperative that children have the agency to join in the debate. For children to be best placed to contribute towards the ongoing debates surrounding global issues such as climate change requires them to have knowledge of key factors affecting the degradation of our environments and depletion of our resources.

Media reports of the potential for global environmental disasters occurring, if governments do not act immediately to change their current trajectories, are fuelling the spread of eco-anxiety amongst our young (Panu, 2020). Children have become acutely aware of issues such as global warming, water shortages, famines, deforestation, the destruction of ocean life and the resultant loss of habitat for *flora* and *fauna*, and they often feel helpless to do anything about it (Hickman, 2020).

Teachers are in a key position to support children's understanding of the many issues that we face both globally and locally, and to develop children's agency for making the confident and well-informed decisions needed to inform their futures.



**Table 1.** The UN 17 sustainability goals in greater detail.

Sustainability Goal	Aim
1. No poverty	To end poverty in all its forms everywhere
2. Zero hunger	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
3. Good health and well-being	Ensure healthy lives and promote well-being for all at all ages
4. Quality education	Ensure inclusive and equitable quality education and promote life-long learning opportunities for all
5. Gender equality	Achieve gender equality and empower all women and girls
6. Clean water and sanitation	Ensure availability and sustainability management of water and sanitation for all
7. Affordable and clean energy	Ensure access to affordable, reliable sustainable and modern energy for all
8. Decent work and economic growth	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9. Industry, innovation, and infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation
10. Reduce inequalities	Reduce inequality within and among countries
11. Sustainable cities and communities	Make cities and human settlements inclusive, safe, resilient and sustainable
12. Responsible consumption and production	Ensure sustainable consumption and production patterns
13. Climate action	Take urgent action to combat climate change and its impacts
14. Life below water	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15. Life on land	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt the reverse land degradation and halt biodiversity loss
16. Peace, justice, and strong institutions	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17. Partnerships for the goals	Strengthen the means of implementation and revitalise the global partnership for sustainable development

Recognition that curriculum change in schools is required to equip the next generation with the necessary skills to address the complex environmental, social and economic problems has been taken seriously by the Scottish (Vision 2030+, 2016), Welsh (Wales and the SDGs, 2019) and Irish (DoE, 2018) governments and, although rather late to the table, seen as important by the English government (DfE, 2021).

### Environmental consciousness as a foundation of sustainability

An understanding of what is meant by sustainability is complex as evidenced by the wide range of conceptual frameworks and their ensuing interpretations (Purvis *et al*, 2018). One very prevalent



description uses three interconnected pillars of Economic, Social and Environmental sustainability (e.g. Basiago, 1999; Molden *et al*, 2012), represented in Figure 1. For a more in-depth discussion of the historical foundations of theoretical conceptions of sustainability, see Purvis *et al* (2018).

The diverse interpretations of sustainability can in some ways be linked to the different emphasis placed upon each of the three pillars. Organisations such as the World Wildlife Fund have argued for greater emphasis being placed upon conservation (WWF, 1991), and Milne (1996) suggests that the priority should be placed upon social and environmental aspects, with economic criteria being subordinate. If the health of our environments is agreed to be of fundamental importance, a very different graphic can be envisaged (Figure 2, Table 2), one that places environmental consciousness and understanding as the foundation of all other aspects of sustainability, with secondary pillars considering social justice, transparent and accountable economics, and democratic leadership.

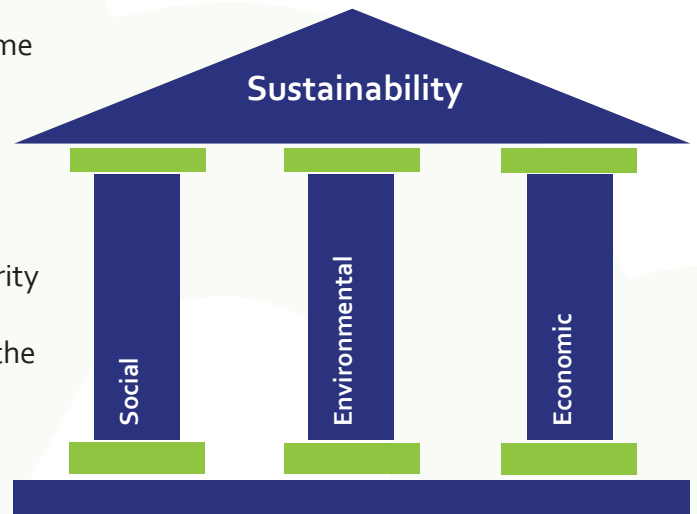


Figure 1. Typical representation of the three sustainability pillars.

It is argued, therefore, that all other factors presented within the sustainability model (see Figure 1) are acutely reliant upon an environment that is healthy and sustained. The critical focus upon eco-systems would help transform current behaviours towards ones that strive to provide protection for our world and its *flora* and *fauna*, and for non-negotiables such as safety and security, equality, democratic justice, and equal opportunity being agreed by humankind. The aim would be a flourishing world for all.

It is argued that the destruction of ecosystems has been almost entirely caused by the wealthiest nations and transnational corporations, yet the resultant consequences have been felt most by the poorest nations (Klein, 2014; ourworldindata.org). Examples of countries that are seriously affected by global warming include Bangladesh, the Maldives, Tuvalu and the Seychelles (Worldatlas.com; UN, 2021). For example, rising sea levels have resulted in unprecedented flooding in Bangladesh, where homes and crops have been destroyed. To better care for our planet, we should not be debating how to balance economic growth, protection of environments, social equality and progress for sustainability (Custance & Hillier, 1998); instead, we must argue for our environments to flourish. For humankind to acknowledge and appreciate that they are an integral part of the Earth's biosphere requires a good knowledge of the complex and fragile interactions between *fauna* and *flora* within ecosystems and this might begin within the school curriculum and with the inclusion of environmental education.

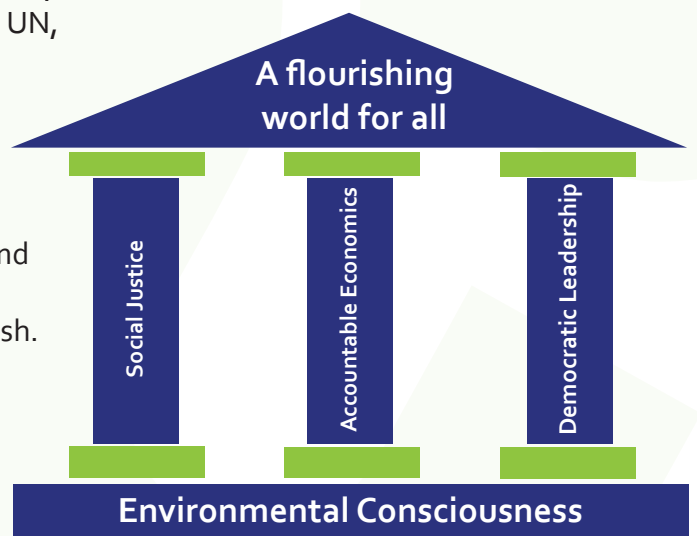


Figure 2. An alternative representation of the pillars for sustainability, and ultimately a flourishing world for all.



**Table 2.** Explanations for the sections in Figure 2.

Pillar	Explanation
Social justice	We need education to drive social justice, developing an understanding of the need for the equity in opportunities and privileges for everyone. We need a society where the more vulnerable are cared for. One where all humankind can support each other to flourish together (White & Reiss, 2014).
Accountable economics	Global, national and local transparency of economics is essential. Wealth should be distributed fairly so that people benefit equally. Pursuit of profit must not be made at the expense of protecting and growing our natural environments for all to enjoy.
Democratic leadership	Leaders need to think and act democratically. They are in 'power' to serve rather than to control. Their intentions should be to make the lives of others better. Democratic leadership is underpinned by a deep understanding and celebration of cultural difference, the importance of social justice and inclusivity.
<b>Environmental consciousness</b> Humankind must understand and appreciate how we are just one part of the complex ecosystems found on Earth. What we do influences the health of the planet. Environmental education will play a pivotal role in engaging the next generation of leaders in supporting the democratic pedagogies required to prepare future generations to act responsibly towards each other and our fragile ecosystems. Children should be able to consider the rights of other living things and become informed about eco-justice.	

Panos and Damico (2021) argue that the power of the media can often distort the evidence about scientific findings to suit their specific agenda. In addition, readers will *'come to texts with their own ideas, values, perspectives and positions which "motivate" each of us to receive and accept information that aligns with our beliefs or confirms pre-existing perspective'* (p.3). Children are also vulnerable to such distortions of evidence and so it is vital that they are provided with evidence-informed, secure knowledge to enable them to understand how they are intrinsically part of the environment and how people's actions, both individually and collectively, can influence the health of an environment and ultimately all living things, including themselves.

### Education for sustainability

For children to recognise, and be able to engage effectively with, the complex global challenges that they will undoubtedly face in their lifetime, there is a need to provide them with opportunities to learn how to collaboratively problem-solve, and apply a range of approaches that integrate a multitude of disciplines (Amos & Christodoulou, 2018). Children not only need to see the 'big picture', but to also explore it in detail in order to consider solutions (Scoffham & Rawlinson, 2022). Such Education for Sustainability (EfS) is supported by pedagogies that engage learners in the socio-scientific aspects of understanding global themes through active engagement and problem-solving approaches (Evans *et al*, 2016; Levinson, 2018). Rieckmann (2012) develops these ideas further by suggesting that the complex global challenges are often contradictory, or 'wicked' environmental problems, which require a 'systems approach' where solutions are found by accessing and integrating ideas from many disciplines. In schools, this might be explored by integrating cross-subject approaches to solve problems (e.g. Markwick, 2021; Strachan, 2022; Strachan & Davey, 2022). Increasing children's knowledge of the issues around the global challenges will increase their sustainability capital.



The English National Curriculum does not explicitly mention EfS, but this does not mean that it cannot be effectively explored through subject areas in the curriculum (DfS, 2013). Developing problem-solving opportunities for children through concepts of sustainability can help to develop scientific and mathematical thinking skills, communication and collaboration skills and a deeper appreciation of local, national and global citizenship (Markwick, in prep; Levinson, 2018). As Jensen (2014) suggests, we have a curriculum that is still educating children as if we have no planetary crisis. Scoffham and Rawlinson (2022) consider in some detail the essential reframing of education to meet these immediate challenges and provide several examples of how teaching across the curriculum might be envisaged. One might argue that, although our current curriculum does not have the integrity it needs for the future, there is potential to make incremental changes that move us closer to this goal.

It is also important to recognise that, too often, teaching and learning is dictated by what is assessed (Wright, 2002; Wormald *et al*, 2009). As Stergiovanni and Starratt (2007) suggest, assessment is often looked upon as '*the tail that wags the dog*', meaning that '*what gets assessed gets taught*' (p.127). If ideas for addressing sustainability are not assessed, then it may be less likely that schools will change their curriculum or pedagogies.

There is a plethora of literature strongly arguing that science and how it interconnects with social and environmental contexts should be learned through enquiry-led pedagogies that develop children's ability to understand complex and interrelated problems, empathise with others and problem-solve from 'real' world evidence (Dole *et al*, 2016; Wiemer, 2013; Minner *et al*, 2010; Panno & Damico, 2021). One starting point would be to apply the Primary Science Capital Teaching Approach (PSCTA), which is founded upon principles of social justice and inclusivity (Nag Chowdhuri *et al*, 2021, 2022). As such, the PSCTA recognises that children need to be introduced to potential local transformations in order to engage them. The importance of a child's immediate influencers, such as family, school and environment, on their personal and social development was recognised by Bronfenbrenner through his Ecological Systems Theory (Bronfenbrenner, 1979). This approach would help to provide children with greater agency, and so reduce eco-anxiety caused by feelings of helplessness towards the global challenges that they are facing (Panu, 2020).

Fullan and Langworthy (2013) argue that pedagogies must encourage deeper learning that includes opportunities to practice critical thinking, creativity and collaboration. To ensure that this is indeed the case, schools could offer a curriculum that engages students with real-world scenarios, or at least pseudo-authentic contexts (modelling real contexts), which provide the opportunities to gain the necessary knowledge and skills to address these types of challenge (Sadler *et al*, 2011; Gallagher & Gallagher, 2013; Amos & Christodoulou, 2018).

Figure 3 illustrates a possible approach, with the learning focus being about the impact of global warming. Children are encouraged to creatively apply knowledge and skills from a range of traditional subject areas. It could be argued that this approach would reduce the depth of learning of these subject areas, yet it can equally be argued that to apply the subject-specific knowledge and skills needed to solve a problem leads children towards a deeper and more nuanced understanding.

Applying enquiry-led pedagogies can be a powerful way to engage children in learning by supporting their curiosity (van Uum *et al*, 2016) and develop children's scientific reasoning through exploratory talk (Mercer *et al*, 2004). This approach can be introduced through problem-based learning (PBL), which has been shown to improve attitudes and motivations towards learning, enhance depth of learning and develop creative thought and abilities to think divergently (Dole *et al*, 2017). When these competencies are applied within a collaborative, enquiry-focused framework, greater autonomy will be achieved and, with this, the potential for developing an innovative mindset in students (Dole *et al*, 2017). It is argued that these ways of learning will provide the next generation with the necessary skills to become the transformative thinkers who we need for ecological, economic and social improvements.



**Figure 3.** An example of how subject areas might be integrated together to help children consider how a global problem might be solved. (See Scoffham & Rawlinson (2022) and Strachan & Davey (2022).)



### Conclusion and recommendations

The acceptance that radical and immediate changes in the way in which we see ourselves as part of our ecosystems has been recognised globally (UNESCO, 2017, 2019; UN, 2015, 2022) and highlights the need for educational transformation to begin today.

Children have the capacity and the right to be involved in issues of sustainability, and teachers can support this through a curriculum intent that focuses on these global challenges. It is imperative that governments support schools by providing learning opportunities that are embedded into the national curriculum. It is also important that assessments have a greater emphasis on questions that specifically focus on ideas around sustainability. Schools may still feel powerless in light of the many challenges that they face, yet they can instigate change within the current national curriculum. What follows are some ideas that schools may want to consider in their journey towards EfS, and a range of resources for EfS are provided at the end of this article.

Teachers will be expected to engage in pedagogies that support children to understand the importance of ecosystems and how humankind influences these, and so it is of importance that governments invest in high-quality professional development now (DfE, 2022).

**1. Adapt your curriculum** to provide children with opportunities to explore and enjoy learning about their natural world. Explore your local environment through the lens of sustainability. Be aspirational in setting targets that promote 'awe and wonder' about our natural world.



2. **Engage children in authentic contexts:** Develop children's agency to contribute effectively towards the changes they want to see. This is a critical aspect in reducing eco-anxiety in children when engaged in education for sustainability (Strachan & Davey, 2022).
3. **Eco-education should be a globally-agreed key focus for children in the early years and primary:** EfS should become a key driver for the primary curriculum.
4. **Teachers will require access to high-quality professional development** to improve subject knowledge and pedagogies. This could be established through existing networks (e.g. Association for Science Education (ASE), Primary Science Teaching Trust (PSTT), Royal Society of Chemistry (RSC), Institute of Physics (IoP), the Royal Society of Biology (RSB) and STEM Learning Ltd.).
5. **STEM in the Community projects** could provide additional support for families to engage in activities centred around sustainability (Markwick *et al*, in prep).
6. **Be aspirational:** aim for a flourishing future for all living things on Earth.

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United Nations, 2022

<https://unstats.un.org/sdgs/report/2022/The-Sustainable-Development-Goals-Report-2022.pdf>

## Worldatlas

<https://www.worldatlas.com/articles/10-countries-that-could-disappear-with-global-warming.html>

<https://unfccc.int/news/most-vulnerable-countries-leading-climate-response>

## Some interesting websites to visit for EfS

**Royal Society of Chemistry**

<https://edu.rsc.org/primary-science/sustainability-contexts-for-primary-science/4014614.article>

**STEM Learning**

<https://www.stem.org.uk/resources/elibrary/resource/26879/recycling-and-sustainability>

**NASA: Evidence for global warming**

<https://climate.nasa.gov/evidence/>

**Nature's path**

<https://www.naturespath.com/en-us/blog/20-activities-kids-learn-sustainability/>

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