A Harmony Perspective: Addressing Nature-Deficit Disorder in children through educational frameworks in Wales to combat the current ecological crisis.

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Abstract

This study explores the potential of integrating nature-based educational frameworks in Wales to address nature-deficit disorder (NDD) among children and support broader ecological goals. Drawing on a mixed-methods approach, the research combines a legal doctrinal analysis of Welsh policy instruments (specifically, the Well-being of Future Generations (Wales) Act (2015) and the Curriculum for Wales (2022)), with empirical insights from a semi-structured interview with industry professional Richard Dunne, and a survey of 62 Welsh educational professionals. Findings from this research support the notion that NDD-addressing strategies can contribute to broader ecological goals, with far-reaching benefits that challenge the entrenched mechanistic views of nature. Findings also reveal a notable disconnect between the progressive sustainability frameworks enshrined in Welsh policy and their practical implementation in schools. Insights from the interview, along with survey responses, indicate that barriers such as rigid curricula, limited outdoor spaces, and scarce training hinder the integration of nature-based learning. This research contributes to ongoing discourse that bridges the gap between policy intent and practice. Ultimately, by nurturing an intrinsic connection with nature from early childhood, Wales can potentially set a precedent for sustainable educational reform, providing a replicable model for other regions grappling with similar challenges.

Introduction:

The escalating ecological crisis has emerged as one of the defining challenges of the 21st century, necessitating urgent action and transformative change to mitigate its impacts and transition towards sustainable practices. Issues such as climate change, biodiversity loss, and environmental degradation not only threaten ecosystems but also jeopardise the well-being of future generations (IPCC, 2023; WWF, 2020; UNEP, 2025). These realities underscore the global push for sustainable policies. However, current approaches, including international agreements and adaptation strategies, primarily address the symptoms of the crisis. For instance, the UNEP's Convention on Biological Diversity (CBD, 1992) sets biodiversity loss targets, and the UNFCCC's Paris Agreement (2015) outlines emission reduction goals. While these measures are crucial, this dissertation argues that achieving sustainability requires more than reactive responses; it demands transformative cultural shifts that redefine humanity's relationship with nature.

Education has been identified as a critical lever for promoting sustainability, fostering a deeper connection to the environment, and empowering individuals to adopt pro-environmental behaviours (UNESCO, 2020). However, despite the growing emphasis on environmental education, children in many Western contexts are increasingly disconnected from nature—a phenomenon conceptualised as 'Nature-Deficit Disorder' (NDD) (Louv, 2005). This dissertation explores the potential of addressing NDD in children, positioning this reconnection as a catalyst for the necessary transformative shifts towards sustainability. Schools, as primary sites for childhood development (Teachers Institute, 2023) offer significant potential for addressing NDD. This research emphasises the need for systemic reforms to achieve sustainability, and highlights childhood reconnection with nature as a potential pathway to these goals.

NDD refers to the cognitive, emotional, and developmental consequences of reduced exposure to nature (Louv, 2005). It encompasses challenges like diminished attention spans, lower physical activity levels, and weakened emotional resilience (Beery et al., 2023). Given that early experiences with nature are strongly correlated with pro-environmental attitudes and behaviours in adulthood (Chawla, 2020), NDD can be seen to have significant implications for sustainability. Therefore, this research explores strategies for addressing NDD that could potentially yield dual benefits: enhancing children's well-being while simultaneously contributing to efforts in combating the ecological crisis.

Dunne and Martin (2020) describe the Earth as a 'complex, self-regulating system' where interconnected and interdependent parts maintain a natural balance to function as a whole in a 'state of Harmony'. Harmony, first introduced in 2010 by HRH Prince Charles, Juniper and Skelly, and described by Campion (2020a) as an 'overarching philosophy', is rooted in principles of interconnectedness, systems thinking, and balance (Campion, 2020b). It is closely linked to sustainability through its inclusion in the United Nations document 'Harmony with Nature'—a response to the 2030 Agenda for Sustainable Development, which establishes Harmony as the result of successful, sustainable policies. Similarly, Tinney (2020) recognised the alignment between Harmonious human behaviour, and sustainable human behaviour.

These examples highlight how Harmony relates to the planet, society, and individuals, demonstrating its connection to the achievement of sustainable development across all levels, and underscoring their intrinsic link. Where sustainable development serves as the official framework, Harmony represents an underlying philosophy and state of being

that naturally leads to it. As Lohman-Hancock and Welton (2020) state ‘sustainable practice is a value base, a way of thinking, an attitude of mind’. This aligns with this research’s focus on developing intrinsic motivation for environmentally responsible behaviours. However, integrating Harmony principles into educational and societal frameworks could potentially generate social and political resistance (Fitz-Henry, 2021). Therefore, while this research examines sustainable development in its official capacity, it is fundamentally driven by the belief that effectively achieving sustainability requires the embodiment of Harmony principles. Thus, adopting Harmony as a guiding framework rather than a core component of its proposed approach.

Wales provides a compelling case study for this research. As one of the few nations globally to embed WCED’s (1987) ‘future generations’ concept into its legal framework through the Well-being of Future Generations (Wales) Act (WBFGA)(2015), Wales stands out as an environmentally progressive region that may be receptive to educational reforms, led by sustainability goals, that target NDD in children. The Act may also be seen to provide a pragmatic pathway for integrating Harmony’s ideologies without directly invoking potentially contentious epistemologies. Furthermore, Richard Dunne’s foundational work at the Ashley Church of England Primary School, and his subsequent collaboration with The University of Wales, Trinity Saint David’s (UWTSD) Harmony Institute, to implement similar strategies in Welsh Primary Schools, provides an ideal opportunity for a case study that has not yet been explored. His work intersects the themes of NDD and Sustainable education through a Harmony lens, offering actionable insights for future research and practical application.

Research Problem and Rationale:

While symptom-based approaches are critical in addressing the ecological crisis, long-term solutions targeting foundational cultural and behavioural shifts are equally important. The contention between economic and environmental priorities in a predominantly economic-driven context means that policy and scientific research frequently neglect the human-nature relationship as a core driver of sustainable behaviour (Spash, 2022). Rather than attempting to overhaul capitalist systems, which are deeply embedded in society, a more pragmatic approach is to focus on fostering stronger connections between individuals and the environment. Given capitalism's inherent adaptability, nurturing personal values and pro-environmental behaviours could gradually influence societal and economic practices, aligning them with sustainability goals (Felli, 2021).

However, the challenge lies in how to cultivate these connections in a society where individuals are increasingly disconnected from nature, as illustrated by the phenomenon of NDD. The specific link between addressing NDD in children through educational frameworks as a means to tackle the ecological crisis has not been thoroughly explored. While there is substantial research on NDD, sustainability education, and the ecological crisis individually, this study proposes an intersectional approach that examines the overlap of these three areas. Schools are particularly well-suited for this research, as they provide an ideal context for early intervention, offer frequent and prolonged exposure to children, and are relatively safe, enclosed spaces for implementing such strategies.

Wales’s progressive stance on sustainability creates an opportunity for exploring innovative strategies, such as addressing NDD through education, within the framework

of the country's broader ecological commitments. Additionally, the work of Richard Dunne, who has been implementing nature-based educational practices in Welsh schools, provides a valuable case study for this research. His efforts align closely with the objectives of this study and offer insights into the feasibility and impact of such approaches. By examining the intersection of NDD, sustainable education, and the ecological crisis through a Harmony lens, this study aims to contribute to understanding how childhood reconnection with nature can serve as a transformative tool for sustainability. Wales's forward-thinking policy landscape, combined with ongoing educational initiatives, offers an ideal setting for exploring these intersections, ensuring that the findings are both contextually relevant and globally applicable.

Aims and Objectives:

The overarching aim of this research is to explore the potential of addressing NDD in children (4-16 year-olds) through educational frameworks, within the context of Wales's sustainability agenda.

Specific Objectives include:

1) To critically evaluate the theoretical and empirical foundations of NDD and its implications for sustainability.
2) To assess the alignment of Welsh educational policies with the goals of mitigating NDD and fostering sustainability.
3) To analyse the case study of Richard Dunne's work in Welsh primary schools as a model for broadly implementing educational strategies aimed at addressing NDD.

4) To identify challenges, opportunities, and practical recommendations for broadly integrating educational strategies aimed at addressing NDD.

Research Questions:

1) Can addressing NDD in children (4-16 year-olds) foster sustainability and support efforts towards the ecological crisis? (RQ 1)
2) To what extent do current educational and sustainable development policies in Wales align with approaches that address NDD and foster sustainability? (RQ 2)
3) What are the key barriers and enablers to integrating strategies that address NDD into Wales's educational system? (RQ 3)

Structure:

The study begins with a literature review that synthesises existing research on sustainable development, NDD, and the role of education. This section identifies gaps and opportunities in current scholarly discourse, and highlights intersections and common themes, establishing a theoretical foundation for the research. The methodology section details the research approach, which includes legal doctrinal analysis, a case study of Richard Dunne's work in Welsh primary schools (involving a semi-structured interview), and surveys. Ethical considerations and analytical strategies are addressed to ensure a transparent and rigorous research process.

The analysis presents the research findings in the order outlined above, which are then discussed within the broader literature and theoretical framework to reflect on how they contribute to answering the research questions. The dissertation concludes by summarising the findings and their implications, offering practical recommendations

for policymakers, educators, and future research. It also reflects on limitations, suggests further exploration, and provides a roadmap for ongoing inquiry and application. This structure supports a logical and cohesive progression of ideas.

Literature Review:

Sustainable Development:

Earth is argued to have entered its sixth mass extinction episode (Cowie, Bouchet and Fontaine, 2022), with over 75% reduction of insect biomass in some regions within one human lifetime (Genoud *et al.*, 2023). While the first five mass extinctions were triggered by natural phenomena, this one has been driven by human activity (Dirzo, Ceballos and Ehrlich, 2022) significantly affecting ecosystem health (Persson et al., 2022). Atmospheric carbon dioxide levels are now higher than at any point in the last 800,000 years, driving unprecedented climatic shifts (Krapp *et al.*, 2021). These cascading environmental crises signify a global health emergency (Abbasi et al., 2023), and underscore the interconnectedness of ecological and societal well-being.

The impacts of ecological degradation on ecosystems, wildlife, and vulnerable human populations in less developed countries have been extensively documented for decades (Foster, Harvey, and Gould, 1998). However, Western societies have been criticised for their delayed and insufficient responses to the crisis (Nixon, 2011). This delay has been attributed to a perceived distance from the consequences of the crisis and an initial lack of direct impacts (Nixon, 2011). Recent and more visible effects in Western contexts, such as extreme weather events—including intensified storms,

severe flooding, and record-breaking heat waves—have underscored the inadequacy of prevailing measures (Hanlon et al., 2021; ONS, 2023). The Global Commission on Adaptation (2019) highlighted the ineffectiveness of responses from leaders, as the crisis escalates in urgency and magnitude.

Incremental measures and distant targets have failed to match the urgency and scale of the problem (Tregidga and Laine, 2021). The scale of the damage already inflicted, compounded by self-reinforcing feedback loops, has accelerated the degradation of natural systems (Lenton *et al.*, 2019). For example, the melting of polar ice caps reduces the Earth's albedo (reflectivity), leading to greater absorption of solar radiation and further warming (Pique *et al.*, 2023). Similarly, species extinction rates are now estimated to be 100 to 1,000 times higher than the natural baseline (WWF, 2022). Ultimately, the state of the environment is extremely dire, with proper reversal and remediation requiring rapid transformations towards sustainability (McPhearson et al., 2021) that's possibility has been questioned by scientists and academics ((Merz *et al.*, 2023).

Additionally, the impacts of the crisis are not distributed equally (Chen, Kang, and Han, 2021; Long, Lynch and Stretesky, 2023). Outside of Western contexts, the ecological crisis has long been a lived reality, particularly in the Global South. These regions, which have contributed the least to environmental degradation, disproportionately suffer from its consequences, including food insecurity, flooding, and displacement (Ngcamu, 2023). Similarly, marginalised and low-income communities are often the most vulnerable to environmental degradation and climate-related disasters. For instance, children from low socioeconomic backgrounds are more likely to suffer from health

complications such as respiratory issues, due to their increased exposure to pollution and poor living conditions in environmentally degraded areas (Mathiarasan and Hüls, 2021). This inequity underscores the urgent need for responses that are not only effective but also equitable, recognising historical responsibility and the disproportionate burdens borne by the most vulnerable (Deivanayagam et al., 2023).

Scientific consensus attributes the ecological crisis to unsustainable human activity (Ruddiman, 2013). Resultingly, sustainable development emerged as a framework for action, building on foundational concepts, such as Rockström's (2009) planetary boundaries framework. A framework that identifies nine critical Earth system processes that must remain within safe operating limits to ensure humanity's survival. The WCED's Brundtland Report (1987) defined sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs', underscoring the principle of intergenerational equity, and emphasising the need to balance economic, social, and environmental priorities. However, balancing these priorities has proven difficult, given the inherent tension between environmental and economic goals (GRICCTE, 2022)—Particularly in a world where economic growth often takes precedence (Hirai, 2022).

Sustainable development gained global prominence at the 1992 United Nations Conference on Environment and Development (the Rio Earth Summit). This landmark event saw the adoption of international agreements such as the United Nations Framework Convention on Climate Change (UNFCCC) and the UNEP'S CBD. These agreements represented the first global recognition of the need to integrate environmental, social, and economic considerations into development policies. In

2015, the United Nations launched the Sustainable Development Goals (SDGs), a set of 17 objectives aimed at addressing interconnected global challenges such as poverty, inequality, and environmental degradation. While the SDGs provide an ambitious framework for achieving sustainable development, it's effectiveness has been questioned. Key criticisms include the lack of clear, measurable criteria for success for many goals and the continued inconsistency in aligning economic development with ecological sustainability across nations (Halkos and Gkampoura, 2021; Biglari, Beiglary and Arthanari, 2021).

Ultimately, global awareness has led to reactive, symptom-based solutions (Feigin *et al.*, 2023). While these solutions are certainly necessary, Lohmann-Hancock and Welton (2020) noted that most 'ecological problems arise from deep-seated social problems'. Industrialisation, deforestation, fossil fuel consumption, overconsumption, and inefficient agricultural practices all reflect a mechanistic view of nature, deeply embedded in society, where the natural world is seen as a resource to be controlled, exploited, and consumed for economic and material gain (Akter, 2024). Communities whose livelihoods depend on the flourishing of nature, such as Indigenous and traditional communities, hold a fundamentally different view and relationship with the environment (De Baro, 2022), which, in turn, influences their behaviour toward it (Turner, Cuerrier, and Joseph, 2022). Merz et al. (2023) describe the ecological crisis as a 'behavioural crisis,' underscoring the importance of the relationship between worldview and behaviour (De Santo, Domptail and Hirsch, 2023). Addressing this crisis requires a fundamental shift in humanity's worldview, from domination and exploitation to respect, interconnectedness, and sustainability (De Baro, 2022).

Wales offers a unique case study on the integration of sustainable development into public policy. In 2015, the Welsh Government enacted the Well-being of Future Generations (Wales) Act (WBFGA, 2015), embedding sustainability into decision-making processes across public sectors. The Act requires public bodies to consider the well-being of future generations and contribute to seven well-being goals, including a resilient, globally responsible, and prosperous Wales (WBFGA, s.3), and demonstrate how their policies align with sustainable development principles (WBFGA, s.5). This approach aims to promote a more integrated, long-term vision for policy, which could be seen as more aligned with sustainable development efforts aimed at transformative cultural shifts.

Nature-Deficit Disorder:

The term 'nature-deficit disorder' (NDD), first coined by Louv (2005), encapsulates the growing disconnection between humans and the natural world. Although not currently recognised as a medical condition, NDD serves as a shorthand for the psychological, cognitive, and societal consequences of reduced contact with nature (Alvarez, Garcia and Le, 2022; Dwyre, 2015). Research on the effects of nature connection predates the term NDD and has consistently highlighted its importance. However, it has become increasingly more significant in light of the current ecological crisis and as exposure to nature continues to decline.

Early studies investigating the relationship between nature and human well-being include Campbell's (1916) work linking social environments to mental health, Kaplan and Kaplan's (1989) findings that nature exposure can reduce stress, improve focus, and enhance creative problem-solving, and Ulrich's (1984) research demonstrating the

quicker recovery times and reduced requirement of pain medication for hospital patients who had views of nature. More recent studies on NDD continue to provide evidence of nature's importance to humanity. For instance, Twohig-Bennett and Jones (2018) found that nature's absence is associated with increased levels of stress, anxiety, and depression. Koay and Dillon (2020) demonstrated that community gardening created higher levels of resilience. Stevenson, Schilhab and Bentsen (2018) explored how nature exposure improves cognitive performance, and Lomax et al. (2024) conducted a meta-review indicating the overall beneficial effects of nature.

While establishing causal relationships in these studies is challenging due to ethical guidelines and confounding factors, the strong correlations highlight the profound impact of the human-nature relationship (Lomax et al, 2024). It's well established that environmental degradation poses serious risks to human health. However, Soga and Gaston (2016) extend this view by identifying NDD as a major public health concern, one that goes beyond the physical damage of natural environments to highlight the essential human need for a connection with nature. This perspective is supported by evolutionary theory, which suggests that even small losses can have serious consequences for survival rates (Neveu et al., 2018), particularly given humanity's intrinsic connection to the natural world (Darwin, 1859). On top of the human health benefits of addressing NDD, White (2004) argued that it could also halt the perpetuation of mechanistic worldviews and environmental indifference, potentially nurturing a generation capable of reversing environmental degradation and tackling planetary challenges.

The impact of NDD on children has garnered significant attention due to its far-reaching consequences for cognitive, social, emotional, and physical development (Beery et al., 2023). Green spaces have been shown to enhance cognitive function by fostering engagement, risk-taking, creativity, and discovery (Markevych et al., 2017). They also improve focus, reduce stress, and increase confidence (Dadvand et al., 2015). Nature-based play strengthens social cohesion, promoting emotional security and resilience (Jain, 2022). Restricted access to nature is linked to higher rates of anxiety, depression, and attention-deficit disorder, as well as diminished social-emotional development (Beery et al., 2023). Additionally, limited outdoor play contributes to childhood obesity, vitamin D deficiency, and other health concerns that are increasingly prevalent in children globally (Janssen and LeBlanc, 2010).

A significant study conducted by the British Nutrition Foundation (2017) sheds light on the extent of children's disconnect from nature. Findings include:

- One in ten 8-11-year-olds thought pasta came from an animal.
- Almost one in five 5-7-year-olds believed fish fingers were made of chicken.
- One in ten 11-14-year-olds were unaware that carrots and potatoes grow underground.
- One in twenty 14-16-year-olds thought cows produced eggs.

These findings illustrate a lack of understanding of food provenance, and are just one facet of the broader implications of the disconnect between children and nature. Younger generations also increasingly struggle to identify native species in their local environments (Skarstein and Skarstein 2020), which has implications for ecological

literacy, the fostering of a meaningful connection to nature, and the effectiveness of local conservation efforts (Erfariyah, Jaenudin and Permana, 2024).

Twenty-first-century children spend less than half the time outdoors than their parents (Press Association, 2016), and one in nine children in England have not visited a natural environment in the past year (Natural England, 2016). Early childhood experiences with nature are strongly correlated with pro-environmental attitudes and behaviours in adulthood (Chawla, 2020), the absence of them contributes to a culture of environmental detachment and indifference (Silverman et al., 2017). Without formative experiences that foster a connection to nature and intrinsic motivations, adults may not develop the sustainable behaviours necessary to combat the ecological crisis (Beery et al., 2023).

Alongside the effects of NDD, it is also important to consider the reasons behind it. Urbanisation and technological advancements are widely recognised as primary contributors to NDD (Fernández *et al.*, 2024). By 2025, it is estimated that 58% of the world's population will reside in urban areas, resulting in limited access to natural spaces (UN, 2018). Additionally, people are spending increasing amounts of time indoors using digital devices, with recent studies indicating that screen time among children has more than doubled in the past decade (Common Sense Media, 2023).

Furthermore, the decline in biodiversity and the degradation of natural spaces contribute to nature disconnection. As ecosystems diminish due to pollution, deforestation, and climate change, opportunities for direct interaction with wildlife and green spaces become scarcer (Louv, 2005). Social and economic factors also play a role, with disadvantaged communities often having less access to parks and green

spaces (Mathiarasan and Hüls, 2021). The Covid-19 pandemic is thought to have exemplified the issue, with stay-at-home orders, park closures, and the subsequent social anxiety it evoked (Johnson et al, 2021).

For children, an additional factor seen to play a role in restricting their access to nature is parental concerns. The National Trust (2012) argued that factors such as traffic dangers, an increased focus on health and safety regulations, and fears of 'stranger danger' have led to a culture of overprotection, often described as 'helicopter parenting.' These fears limit children's opportunities for independent outdoor exploration and engagement with natural environments.

While these are commonly cited drivers of NDD, Long (2024) argued for a deeper understanding of the issue. He suggested that it is not merely urbanisation or digitalisation driving NDD, but the impact these changes have had on the human-nature relationship. Long argued that without addressing the utilitarian mindset— that prioritises technological progress and economic growth over environmental stewardship—and fostering a deeper ecological consciousness, efforts to reconnect with nature may remain superficial and ineffective.

The Role of Education:

Children today are increasingly caught between a 'nature deficit' and a 'technological surplus,' a dynamic that challenges their individual identity development (Fernández et al., 2024). This context arguably necessitates a reconceptualization of the 'pedagogical value' attributed to educational environments, highlighting nature's potential as a transformative element in learning (Fernandez et al., 2024). As Lohmann-Hancock and Welton (2020) note, 'education by its nature is a progressive and forward-looking

process' that is essential for developing a critical perspective on sustainability. Early years educators are also argued to play a pivotal role in promoting ecological literacy and fostering sustainable behaviours from an early age (Tinney 2020; Cutter-Mackenzie et al., 2014).

Educational initiatives such as Environmental Education (EE), Education for Sustainable Development (ESD), and outdoor learning have demonstrated their potential to enhance children's understanding of natural processes, foster emotional attachment to the environment, and encourage environmentally responsible behaviours (Harvey *et al.*, 2019; Sobel, 2004). EE was an early educational trend with an environmental protection approach, while ESD is the formal commitment promoted by the United Nations (2002) to ensure that countries achieve sustainable development. Incorporating nature-based play, outdoor classrooms, and field trips into school curricula can mitigate the effects of NDD and reconnect children with the natural world (Mann et al., 2021). Place-based education (PBE), which grounds learning in local communities and surroundings, fosters a sense of stewardship and environmental literacy (Yemini, Engel, & Simon, 2023). Hands-on learning experiences such as gardening, wildlife conservation projects, and environmental activism further reinforce a sense of responsibility and awareness of the impacts of human actions on the planet (Nourmoradi *et al.*, 2021).

Several initiatives demonstrate the practical benefits and efficacy of nature-based education in combating NDD. Richard Louv's Children & Nature Network (2006) initiated programmes to support educators, parents, and community leaders to reconnect children with nature, through green schoolyards and outdoor learning opportunities. Similarly, the Forest Schools movement, originating in Scandinavia and now adopted

worldwide, offers a learner-centred and cross-curricular model that supports play, exploration and risk-taking, integrating nature into formal education settings (Harris, 2022). Eco-friendly schools have been shown to increase positive attitudes towards the environment in children, emphasising the importance of role-modelling by teachers (Muafiah *et al.*, 2021).

In the UK, the Children and Nature Programme—part of the 25-year Environment Plan (2018) which aims to help children from 'disadvantaged backgrounds to have better access to natural environments' (NAEE, 2020)—has led to initiatives like the Nature-Friendly Schools project and the Forest and Woodland Outreach Project. Targeting schools with the highest proportion of disadvantaged students in England, these projects have delivered natural environment interventions to approximately 300-400 schools, yielding positive outcomes and high levels of teacher enthusiasm for the personalised support provided (FSA, n.d.).

One project, particularly relevant to this research, was led by Richard Dunne at Ashley Church of England Primary School, where a distinctive curriculum revolving around 'nature-based principles of harmony' was developed. The curriculum had three primary aims: reconnecting children with nature, engaging them in problem-solving, and making learning purposeful in addressing NDD (Dunne and Martin, 2020). Research on Ashley Church of England School found that students were aware their education prepared them for life beyond school, which fostered leadership skills and agency, and praised the success of the school's 'holistic, multi-layered approach' (Kemp and Pagden, 2018). Its success was also reflected in SAT results: 98% in reading (national average 75%), 93% in writing (national average 78%), 98% in grammar, punctuation, and spelling

(national average 78%), and 93% in mathematics (national average 76%) (Dune and Martin, 2020). Building on this success, Dunne founded The Harmony Project (2020), an initiative that places sustainability at the core of education. His partnership with the University of Wales, Trinity Saint David's Harmony Institute, is supporting Welsh primary schools in adopting sustainability-focused curricula.

The importance of education's role in supporting sustainability is not only echoed in academic research and practical initiatives but is also firmly embedded in policy frameworks. The United Nations' Agenda 21 (UNCED, 1992) emphasised the need to reorient existing education systems to address sustainable development, through Chapter 36 which deals with 'Promoting Sustainable Development through Education and Training'. In addition to the UN's framework and the formal commitment of ESD, UNESCOS's Global Action Programme on Education for Sustainable Development and the Sustainable Development Goals (SDGs) (UN, 2015) have provided international benchmarks. For instance, Target 4.7 of the SDGs explicitly states that by 2030, 'all learners acquire the knowledge and skill needed to promote sustainable development, including, among others, through ESD'.

In England, the Early Years Foundation Stage (EYFS), introduced in 2008, embedded nature connection as a core element in the curriculum, ensuring that even at the earliest stages, children develop a foundation of ecological awareness and responsibility (Department for Education, 2024a). Rose and Gilbert (2017) noted that while there was considerable enthusiasm among teachers for the EYFS, they observed a 'power struggle between policy and the ideology of an early years pedagogy', and the importance of 'quality and well-qualified practitioners' in effective delivery. They also

highlighted a desire from participants of their research for the EYFS framework to be extended to later years, as seen in the Welsh equivalent framework, known as the Foundation Stage. The Welsh Foundation stage was developed after the EYFS, and introduced in 2010, placing a similar emphasis on nature connection in the early years of education. Curricular policy developments like these have supported UK-wide projects aimed at fostering nature-connection in children (McLure and Aldridge, 2023).

Welsh Government policies such as 'Education for Sustainable Development and Global Citizenship' (2008), have prioritised sustainability across educational sectors. The Curriculum for Wales (2022) explicitly integrates sustainability principles in its Areas of Learning and Experience (AoLEs), particularly in Science and technology, humanities, and health and wellbeing, as well as being a core principle in its Four Purposes. These legal mechanisms highlight education as a critical driver in fostering long-term sustainable development, and have led to tangible reforms, such as the integration of eco-friendly practices in classrooms and community-based environmental projects (McLure and Aldridge, 2023).

Despite widespread recognition of the benefits and policy support for sustainability education, challenges remain. In 2001, Sterling argued that education models continued to develop non-sustainable practices, necessitating a shift towards transformative educational paradigms. This sentiment continues to be echoed (Lohmann-Hancock and Welton, 2020), highlighting a stagnated development in education systems (UNESCO, 2023). This is evident in the UK's Voluntary National Review of the SDGs (HM Government, 2019), which shows that the UK is not fully meeting the relevant benchmarks. For example, many UK schools are shown to face

challenges in consistently integrating sustainability into their curricula (p62-74). One reason for this is thought to be the practical challenges faced by teachers like resource constraints, rigid curriculum demand, and the pressures of standardised assessments (Tinney, 2020).

Integration and Summary:

The literature review reveals an urgent global environmental crisis driven by unsustainable human practices, which are deeply intertwined with social and economic inequities. Addressing the crisis requires both immediate, symptom-based responses and long-term foundational solutions rooted in sustainable development—a holistic, interdisciplinary approach that resonates with the concept of Harmony. In this context, NDD illustrates how modernity has fostered a significant disconnection between people and nature, adversely affecting both human well-being and planetary health.

Characteristics of modernity most commonly cited as driving NDD include urbanisation and digitalisation. However, much of the literature does not advocate for the elimination of these modern conveniences, given their undeniable benefits and integration into daily life. Abolitionist approaches would also, undoubtedly, lead to significant resistance, which is particularly relevant when considering Wales which, through the WBFGA (2015), emphasises the importance of public body collaboration in enacting law and policy on the ground level. Instead, scholars like Long (2024) argue that the focus should be on overcoming the entrenched mechanistic worldview that underlies modernity, which he describes as the resulting 'shift from harmonious coexistence with nature to a human-centred utilitarian mindset'. This perspective offers an opportunity to

develop environmental solutions within existing societal structures by altering public perceptions, nurturing pro-environmental attitudes, and influencing consumer demand, thereby gradually adapting broader capitalist systems.

Education emerges as a crucial intervention point. It mitigates several of the recorded barriers to nature connection for children today by offering a controlled and safe environment that addresses parental concerns about street risks and stranger danger and ensures equitable access to nature-based experiences regardless of socioeconomic background. As primary environments for childhood development, schools present significant opportunities to increase exposure to nature. By integrating nature-based learning into curricula from an early age, educational settings not only foster a connection with nature but also serve as vital platforms for nurturing sustainable behaviours and supporting intergenerational sustainable development.

Overall, the literature review provides a framework for understanding how this research relates to current discourse, and the gaps and opportunities within it. Ultimately, this research aims to connect all three areas of research (Sustainable Development, NDD, and Educational intervention), to address the under-exploration of how addressing NDD through education frameworks in Wales can help support broader sustainable development goals.

Methodology:

This research adopts a pragmatic paradigm, which acknowledges the complexity of real-world issues and allows for the integration of both qualitative and quantitative methods (Creswell & Creswell, 2017). Pragmatism is particularly suitable for this study, as it enables a practical exploration of how addressing NDD through educational frameworks in Wales can support broader sustainability goals. Given the interdisciplinary nature of the research, which intersects education, sustainable development, and NDD, a flexible and results-oriented approach is necessary.

A mixed methods approach has been selected, combining both qualitative and quantitative data collection techniques, to provide a holistic understanding of the research problem. The research primarily uses qualitative methods, including legal doctrinal analysis, interviews, and open-ended survey questions, while additional quantitative data from the survey offers further support. The combination of these methods ensures triangulation of data, increasing the research's validity and reliability (Denzin, 2012).

The legal doctrinal analysis is employed to assess the capacity of Welsh legal frameworks to support NDD intervention strategies. The key documents that have been analysed are The WBFGA (2015) and The Curriculum for Wales, these were chosen due to their relevance to the research topic. Given more time and resources, several other documents could have been included in the analysis to deepen understanding. This analysis employs several established interpretive methodologies to ensure a balanced and robust examination of the relevant legal texts. Textualism is used to focus on the plain, ordinary meaning of the statutory language, purposivism (or teleological interpretation) looks at the underlying objectives and legislative intent, systematic

interpretation is applied to assess how the legal frameworks fit within the broader context of Welsh and international sustainable development policies, historical interpretation provides context by considering the evolution of the legislation, and a comparative approach is used to benchmark Wales's commitments against international standards (Hamzani *et al.*, 2023).

A survey was distributed to employees in the education sector in Wales to gather quantitative and qualitative insights into current perceptions, barriers, and experiences related to integrating nature-based learning into educational settings. Non-probability sampling techniques were employed to reach participants relevant to the study. The survey was initially sent directly to all schools in Wales using the primary contact email addresses listed on local authority websites. This purposive sampling approach (Ahmad and Wilkins, 2024; Mitchell, 2022), was selected to ensure that respondents were actively engaged in the education sector and likely to have insights on nature-based learning. To further enhance participant reach, the initial survey email requested that recipients circulate the survey among additional staff within their schools, following a snowball sampling approach which is particularly useful for accessing hard-to-reach populations and ensuring a broader representation of opinions (Hossan, Mansor and Jaharuddin, 2023). Although snowball sampling can introduce biases due to the reliance on participants' networks (Hossan et al.,2023), measures were taken to mitigate this by clearly defining inclusion criteria and cross-checking demographic data.

The survey included questions on demographic information, personal prioritisation of environmental sustainability, awareness of NDD, perception of NDD's prevalence in their work, and perceived barriers and enablers to implementation of nature-based

learning techniques (See Appendices B for the full list of survey questions). Most of the questions were structured using a Likert scale (e.g., Extremely Agree, Agree, Neutral, Disagree, Extremely Disagree, Unsure), while others allowed for open-ended responses. Quantitative data from the Likert-scale questions were analysed using descriptive statistics (e.g., calculating mean scores on Likert-scale items), and thematic coding was applied to the open-ended responses to extract qualitative insights. This dual analysis ensured that both numerical trends and contextual explanations were captured. Data processing was supported by software tools from Microsoft Forms. Iterative coding cycles and inter-coder reliability checks with the research supervisor ensured consistency and minimised subjectivity in the qualitative analysis, this follows Braun and Clarke's (2006) framework for qualitative insights.

The survey was designed and administered using Microsoft Forms. This platform was selected due to its ease of use, efficient data collection capabilities, and robust data protection features (Microsoft, n.d.). All responses were automatically recorded, and access to the raw data was restricted exclusively to the researcher via secure login credentials. This method allowed participants to complete the survey anonymously without any personal data being stored. Although this approach meant that the accuracy of participants could not be independently verified, the selective distribution methods, honesty declaration, and collection of demographic data helped to ensure participants were from the relevant field.

There are 1,460 local-authority-maintained schools in Wales (Statista, 2025) and there were 25,527 teachers in Wales in 2022/23 (Department for Education, 2024b). This research's sample represents only a small percentage of the potential population,

thereby preventing broad generalisations of these results. Because of the use of snowball sampling, it is also difficult to determine exactly how many emails the survey was distributed to. However, emails were sent to all accessible school contacts on local authority websites—with an approximately 7% undeliverable rate. Undeliverable emails were attributed to challenges like out-of-date contact information or spam prevention mechanisms. Despite the sample size, the results still offer important supporting evidence for the rest of the research and could still be used to inform subsequent, more comprehensive studies (Lee and Landers, 2022).

Investigation into Richard Dunne's work with Welsh Primary Schools provided a practical model for integrating nature-based learning into Welsh schools, aligning with both the Harmony approach that guides this research and sustainability principles. A semi-structured interview was conducted with Dunne to provide first-hand insights into the practical challenges and successes of implementing nature-based educational interventions. The interview was conducted virtually via Microsoft Teams, recorded, and later transcribed (see Appendices C for full transcript). This approach was decided to minimise logistical challenges and ensure convenience for the participant (Oliffe *et al.,* 2021). The questions involved looking into the work Dunne has done broadly with UK school curricula, specifically his work with Welsh Primary Schools, his insights into NDD's prevalence in children, his experience implementing nature-based education, and the barriers and enablers he has encountered. The analysis of the interview incorporated both thematic and framework analysis to understand how Dunne's insights relate to the research questions and to facilitate comparison with the survey results (Knott *et al.*, 2022).

Dunne was identified as a participant due to his connection with The University of Wales, Trinity Saint David's Harmony Institute, and his extensive experience in developing curricula that emphasise nature-based approaches, and innovative work in addressing NDD in children. The work he is doing with Welsh Primary Schools is closely connected to this research's topics, and given his accessibility through similar university networks, he was selected using opportunistic sampling methods (Nyimbili and Nyimbili, 2024). Insights into his work before direct engagement with him were gathered through networks within the University of Wales, Trinity Saint David's, as well as looking at his previously published work such as Dunne and Martin (2020). From this research, it was gathered that Dunne was working with schools to help develop and support curricula framed around 'nature-based principles of Harmony'. Given that Dunne is established within the academic field, the use of his name in the research outputs was deemed appropriate and thought to enhance the credibility of the research findings (Von Soest, 2022).

Data collection and analysis occurred over 4 months. Prior to the main phase, the survey and interview questions were developed, with regular feedback from the research supervisor, to ensure clarity and effectiveness. Question creation and analysis for both the survey and the interview that aimed at understanding the prevalence or perceived prevalence of NDD in children today were influenced by Wang et al.'s (2021) adolescent nature deficit scale, as well as other discourse into the effects of NDD. The scale divides NDD into subsets: objective nature deficit, lack of natural knowledge and contact, psychological nature deficit, lack of empathy towards nature, identification with natural life-beings, and sensation to nature. Given that the general public, including educational professionals, might not be aware of NDD as an official term, questions

were framed around the effects of NDD rather than its formal definition to avoid confusion.

Ethical Considerations:

Ensuring ethical integrity was crucial in this research to ensure data collected could provide valuable insights for the study, to ensure this, a detailed proposal of the research was sent to the University Of Wales, Trinity Saint Davids Ethics Committee for approval before any data collection began. Approval was granted on 07/01/2025, allowing the research to proceed under strict ethical guidelines. The research is deemed low risk. The surveys were designed to exclude most personal identifiers (besides statements and opinions), and the interview was conducted with the transparency of intent to publish the participant's identity. Although the topics addressed are not inherently sensitive, the research acknowledges that discussions around climate change and educational practices could evoke climate anxiety (Ágoston *et al.*, 2022) or highlight potentially harmful school practices. Therefore, several measures were implemented to ensure that ethical considerations were rigorously maintained throughout the study.

Participants in the survey were provided with informed consent forms before beginning the study. These forms clearly outlined the research objectives, the participants' rights to not answer any questions and withdraw at any point throughout its completion, and the measures being taken to maintain data confidentiality. To protect anonymity, all survey responses were submitted and stored without any personal details of participants (such as names and contact information). Participants were informed that due to the anonymous nature of the responses, the retraction of their data after

submission would not be possible. In compliance with GDPR guidelines, where personal opinions and statements may be considered identifiable, no complete submissions (linking broad demographic information with personal statements) have been published. When quotations are used, any potentially identifying details have been removed, and only statements reflecting common sentiments across the data have been selected.

At the end of the survey, participants were provided with links to supportive climate cafés, should the topics addressed in the survey evoke any environmental anxiety. They were also provided with information on how to access support If they wanted to look into the topics further or help in implementing more nature-based learning into their work (see Appendices B). Participants were clearly informed that the survey was not intended to address or report harmful school practices, and were advised to follow the appropriate guidance within their institutions if needed.

The interview with Richard Dunne followed a similarly rigorous ethical protocol. Oral consent was obtained before the interview commenced, and explicit permission to record the session was secured via email and reiterated before the recording began. Consent was also explicitly obtained for the inclusion of his name in the research outputs. The consent declaration before the survey began, covered the same topics of the survey, ensuring the participant knew the research objectives, their rights, and the ethical practices in place.

The triangulation of multiple data sources further enhanced the reliability of the study by ensuring a comprehensive and transparent analysis (Baldwin *et al.*, 2022). Recognising that the researcher's ontological and epistemological positions might

influence data interpretation, the multi-layered approach enabled cross-verification of findings, reduced potential subjectivity, and ensured thorough coverage of the research questions. In addition, the use of multiple established analytical methods, particularly in the legal doctrinal analysis, further mitigated research bias.

Findings and discussions:

Legal Doctrinal Analysis:

Wales is the first country in the world to legislate for the well-being of current and future generations in a way that aligns directly with the United Nations Sustainable Development Goals (2015). Its unique approach, embodied in the Well-being of Future Generations (WBFGA) Act 2015, creates a legally binding duty on public bodies to promote sustainable development—a duty that spans a wide array of entities, from Welsh Ministers and local authorities to health boards and cultural institutions. This progressive legislative framework makes Wales an ideal setting for exploring innovative strategies to address the ecological crisis, including the integration of interventions for NDD into educational frameworks, highlighting the WBFGA (2015) as a key document for examination for this research. The research considered this document alongside the Curriculum for Wales framework (2022), to explore whether these documents could be aligned with NDD-addressing educational strategies that support broader environmental goals.

A textualist reading of the WBFGA (See sections 3 and 5) reveals its clear definition of sustainable development as 'the process of improving the economic, social,

environmental and cultural well-being of Wales by taking action, in accordance with the sustainable development principle, aimed at achieving the well-being goals.' This precise language underscores the statutory commitment to a holistic approach that considers economic, social, environmental and cultural factors. The Act does not explicitly mention NDD, and does not currently specify any measures or guidelines directly related to educational interventions. However, its focus on long-term well-being creates an interpretive space in which nature-based educational interventions can be justified. The Act's plain wording mandates that public bodies work collaboratively, integrate efforts across sectors, involve community stakeholders, plan for the long term, and prioritise prevention. These principles collectively provide a compelling basis for arguing that strategies aimed at connecting children with nature to support broader ecological goals, fall within the Act's ambit.

When considering the broader legislative purpose behind the WBFGA, the Act was designed to ensure that the well-being of future generations is embedded in every decision made by public bodies (Welsh Government, 2025b). The legislative history and policy objectives reveal a clear intent to promote an intergenerational approach that values sustainable practices and preventative measures (Bory, 2024). Under this interpretive lens, interventions to address NDD through educational reforms are not merely ancillary but are central to the Act's vision. As highlighted in the review of academic literature, fostering a direct connection between children and the natural world can contribute to better mental and physical health outcomes, enhance environmental literacy, and cultivate long-term pro-environmental behaviours. These outcomes directly support specific SDGs such as SDG 3 by promoting better health, SDG 4 by contributing to quality education through experiential learning, SDG 11 by

encouraging sustainable community development, and SDG 13 by fostering climate-resilient mindsets, and resonate strongly with the WBFGA's overarching aim of safeguarding the future well-being of Wales.

A systematic interpretation of the WBFGA situates it within the broader ecosystem of Welsh public policy and international legal standards. The Act obliges a diverse range of public bodies, such as Natural Resources Wales, local health boards, and even cultural institutions like the National Library of Wales, to collaborate in the pursuit of its 7 well-being goals (See sections 3 and 5). This network of agencies creates opportunities for cross-sectoral initiatives. For instance, Natural Resources Wales is charged with the management and provision of green spaces (NRW, 2024), which are essential for outdoor learning environments. Local authorities and public health organisations currently work together to monitor and improve indicators such as mental well-being, healthy lifestyle outcomes, and community engagement (Welsh Government, 2024b). Yet, despite the emphasis on collaboration for several objectives, the Act does not prescribe specific performance indicators related to nature-based educational interventions or environmental literacy outcomes. By integrating nature-based educational interventions into the fabric of these varied yet interrelated public services, policymakers could create a cohesive strategy that leverages the full spectrum of the Act's mandate.

By tracing the evolution of Wales's commitment to sustainable development, the WBFGA can be seen to represent a milestone in public policy, emerging at a time when concerns about climate change and ecological degradation were reaching critical mass (Bory, 2024). Historical records indicate that Wales was driven to adopt this

comprehensive legislative framework as a proactive measure to counteract long-term environmental risks (Neubauer and Repenning, 2023). Understanding this context is crucial because it highlights the transformative ambition of the Act, an ambition that could be receptive to novel interventions, and therefore be extended to include strategies for addressing NDD through school frameworks to support its well-being goals. By embedding nature-based learning within the educational system, Wales could be seen to be building on its historical legacy of pioneering sustainable practices.

Comparative interpretation offers another valuable perspective by positioning Wales alongside international frameworks such as the UN's SDGs and UNESCO's ESD guidelines. These global benchmarks emphasise the importance of experiential, transformative education that fosters a direct connection with nature. For example, UNESCO's ESD guidelines advocate for learning approaches that are immersive and contextually relevant, while the SDGs explicitly call for quality education (SDG 4) and action on climate (SDG 13). With many countries still developing their policies (Zhan and Santos-Paulino, 2021), Wales is already at the forefront, legally mandating sustainable development through its well-being framework. This comparative advantage not only reinforces the legitimacy of integrating NDD interventions into educational policies but also sets a precedent for other nations to follow. It shows that if Wales, already committed to long-term, sustainable development, can incorporate innovative, nature-based educational strategies, then similar approaches may be feasible elsewhere. For example, the precedent Wales set with the WBFGA has been shown to have inspired discussion and pilot initiatives in places like Scotland and Gibraltar (The Future Generations Commissioner for Wales, n.d.), highlighting the potential of these innovations to catalyse broader change.

Turning to the Curriculum for Wales (2022), which is established under the Curriculum and Assessment (Wales) Act 2021 (Section 71), is a statutory framework designed to guide educational content and pedagogy for learners aged three to sixteen. The Curriculum for Wales is aimed at creating ambitious, capable learners; nurturing enterprising, creative contributors; and developing ethical, informed citizens (Section 2.3). Its statutory guidance emphasises not only what is taught but also how and why it is taught (Section 4.1). This ethos can be seen to align well with NDD addressing, and nature-based educational strategies which, as highlighted in the literature review, contributed towards things like physical and mental well-being, ecological literacy, and pro-environmental behaviours, among other things. Although the current framework does not mandate regular, structured outdoor learning as a core component, its language on holistic and experiential learning provides a good basis for reform, where NDD addressing strategies can be incorporated into its scope. For instance, specifying a minimum number of hours per term to be devoted to outdoor activities would create measurable benchmarks for environmental engagement, directly addressing the symptoms of NDD.

A textual analysis of the Curriculum for Wales shows that the document is designed to ensure consistency and quality across all maintained schools and settings while remaining flexible enough to allow for innovative pedagogical approaches (Welsh Government, 2022). This flexibility is seen as one of its strengths (Evans, 2023), but in the context of this research, it also represents a weakness: by not mandating specific measures for nature-based learning, the curriculum leaves significant room for variation in how, or even if, schools implement such strategies. This gap in statutory guidance means that while schools may choose to integrate environmental initiatives,

there is no uniform obligation or performance standard, which could lead to disparities in how effectively NDD interventions are deployed across Wales.

However, the flexibility and the guidance's focus on cross-disciplinary planning and collaborative learning, could also be seen to support the development of distinctive curriculums such as those being developed by The Harmony Project. These elements align with how Dunne and Martin (2020) described the EYFS framework in England provided a basis for the development of the distinctive curriculum in the Ashley Church of England Primary School to be informed by 'nature-based principles of Harmony', as discussed in the literature review, and therefore can act as an avenue for implementing similar approaches more broadly in Wales to including nature-based learning. So while it's not mandatory, the framework does not prevent NDD addressing or nature-based educational strategies, and educators are able to reinterpret sections to encompass these things. For example, sections related to personal and social education or environmental studies can be interpreted to include explicit directives for nature-based interventions.

When trying to understand the purpose of the Curriculum for Wales framework, a reasonable assertion would be that the underlying intent is to develop well-rounded individuals who are not only academically proficient but also socially and environmentally conscious. The Framework's focus on fostering ethical, informed citizenship (Welsh Government, 2022) suggests an appreciation for education that extends beyond conventional academic outcomes. By fostering direct engagement with the natural world, the curriculum could help students develop an intrinsic appreciation for ecosystems, thereby promoting sustainability. The notion of a well-rounded

individual can also be seen to relate to the other benefits of addressing NDD including mental and physical health. This purposive reading supports the proposal that NDD addressing strategies could be statutory requirements within the curriculum, enhancing its capacity to deliver on both educational and ecological outcomes, and develop well-rounded, ethical and informed citizens.

As Wales continues to evolve its educational policies in response to contemporary challenges, there is an opportunity to reflect on the successes of past reforms and the lessons learned from international best practices, this is one reason that examining different projects such as Dunne's is important for the research to gauge the practical challenges of implementing them. The historical trajectory of the Welsh education system has been marked by progressive changes that prioritise inclusivity, innovation, and sustainability (Evans, 2021). Embedding nature-based learning into the curriculum would represent a natural progression in this evolution, a continuation of Wales's long-standing commitment to improving the well-being of its citizens through forward-thinking educational strategies.

If the Curriculum for Wales could be more closely integrated with the WBFGA to form a coherent policy framework, the collaborative ethos mandated by the WBFGA and the cross-disciplinary, experimental learning outlined in the curriculum could work together to support innovative educational initiatives that meet well-being goals and align with specific SDGs. For example, linking initiatives that improve mental health (SDG 3) and environmental literacy (SDG 4) would provide measurable outcomes that benefit both individual students and the community as a whole. Such an integrated approach would

ensure that interventions addressing NDD are not treated as isolated initiatives but are embedded within the broader educational and sustainability strategies of Wales.

As has been highlighted, the doctrinal analysis performed in this research reveals substantial opportunities for embedding NDD interventions within Welsh educational frameworks. By aligning the language and objectives of legal instruments with international benchmarks, this analysis demonstrates that nature-based educational interventions that address symptoms of NDD could also serve as a component of Wales's broader ecological strategy. However, this analysis is somewhat limited given its focus on just the two instruments, and therefore, for a better understanding of the Welsh framework's receptivity to initiatives such as those proposed in this research, a more expansive analysis should be conducted.

Interview:

The interview with Richard Dunne was conducted on 31/01/2025 for ~45 minutes. This section demonstrates how his reflections mirror and expand upon the theoretical foundations discussed in the literature review by highlighting the potential of NDD addressing strategies to combat broader ecological challenges, and aligning with several insights from other established academics. Several of his insights also relate to findings from the legal doctrinal analysis. These alignments add further credibility to the combined methodology. The thematic analysis of the interview with Dunne revealed five main themes of discussion: the need for nature-connecting approaches, shortcomings of the predominant educational model, the potential of Welsh frameworks to support nature-based approaches, the practicality of implementing such approaches, and the use of Harmony as a guiding principle. Through framework analysis, it was decided that

several of these themes directly related to, and deepened the understanding of the research questions (RQ 1, 2, and 3) outlined at the beginning of this paper.

Throughout the interview, Dunne illustrates his strong conviction regarding the need for and the value of nature-connecting initiatives in educational frameworks. For instance, he describes nature-connecting approaches as 'a better way', which, when done right, means 'children will have a relationship with the world around them and then they'll care about it.' As an industry professional and an academic, closely engaged with several overlapping themes of this research, his perspective lends considerable credibility to this study. Dunne quoted early in the discussion that if 'people don't know about, understand, or love nature, they are not going to care for it'. This quote directly aligns with insights obtained from the literature review, from scholars like Chawla (2020), that lack of direct, personal relationship with nature in early education could underlie later environmental apathy. Therefore, it can be asserted that Dunne views the integration of NDD-addressing strategies in education as a viable means to foster sustainability and support efforts towards the ecological crisis (RQ 1), which supports the rationale and purpose of this research.

Dunne's discussion of the benefits of nature-connecting approaches encompasses environmental improvements, as well as enhancements to child and teacher wellbeing, underscoring the findings of the literature review of addressing NDD's expansive potential. While he acknowledges the difficulty of obtaining measurable results from his work in Welsh primary schools, given their relative infancy and the need for more longitudinal studies, he signals some of the observations he and other members of staff have made on the positive impact of their work, such as the children's enjoyment and

engagement with the learning. One key area is improved staff retention. With teacher retention being at an all-time low in Wales (Education Policy Institute, 2024), this insight is particularly interesting.

He asserts that nature-connecting approaches to learning can re-ignite teachers' love and passion for teaching. He recounts a teacher's remark: 'I feel like I've got my mojo back,' after doing nature-based curriculum activities, to underscore his point. The literature review similarly revealed how other nature-connecting education initiatives have yielded comparable enthusiasm from teaching staff. This highlights again the expansive potential benefits of addressing NDD through education systems. Dunne related this discussion back to the children by stating: 'If the teacher's not enamoured with it, or enjoying it, then it's going to be really hard for the children to be the same'. The reciprocal relationship between teacher well-being and student engagement highlights the importance of investing in professional development and support systems that promote innovative pedagogical strategies.

The recurring critique of the prevailing educational model highlights how Dunne sees the need for certain reforms and innovations, such as the one outlined in this research. Dunne's perspective is that modern schooling, with its heavy reliance on classroom-based, data-driven learning, is a key contributor to NDD. He also explains that school systems are 'pressurised around data', and because of rigid curricular demands and standardised assessments, many schools view outdoor or nature-based learning as a distraction from 'real' academic work, echoing sentiments like Tinney's (2020) from the literature review. Instead, the prevailing structure tends to restrict opportunities for

children to interact with the natural world, thereby contributing to a disconnection that can have broader implications for environmental care.

During a discussion on the WBFGA (2015), he emphasised barriers in the period of adjustment to the relatively new legislation, stating the challenge as: 'getting people to really understand' what the changes mean. As schools transition from older, subject-siloed systems, educators and administrators must reframe traditional ideas of learning to incorporate broader ecological and community-based objectives, and 'unlearn' old practices. These insights reflect those from scholars like Tinney (2020), and Lohman-Hancock and Welton (2020) in the literature review, which highlighted specific obstacles such as teacher training, and the perceived stagnation in educational developments. This discussion substantially contributes to the understanding of the key barriers and enablers to integrating NDD strategies into Wales's education system (RQ 3).

Dunne also comments on the pervasive influence of digitalisation and social media, describing it as a 'massive distraction' for many children, and expressing his views on how screens draw children into virtual worlds that distance them from direct, embodied experiences with nature. He highlights this growth in digitalisation as one of the causes of the critical need for educational interventions that address NDD. This insight aligns with those highlighted in the Literature review about digitalisation being a factor in the growing phenomenon of NDD (Fernández *et al.*, 2024; Common Sense Media, 2024). The consistency between his views and other scholarly perspectives reinforces the credibility of his discussion.

While he highlighted the barrier of transition to new innovative legislation, his overall feedback on the WBFGA (2015) was extremely positive, referring to it as a 'fantastic driver for everything that Wales now stands for', specifically praising its broad scope and inclusivity from children and adults, to land and nature. He also specifically mentions the Curriculum for Wales (2022). The inclusion of these two legal instruments in his discussion, done so without prompt from the interviewer, justifies the analysis of these documents in the legal doctrinal analysis component of this research, and their relevance to the investigation into how NDD addressing educational strategies could be leveraged to support broader ecological goals (RQ 2).

Dunne praised the new Curriculum for Wales (2022) for its granting of more ownership to schools, and contextualisation of learning. In his view, this flexibility is a positive aspect of the document when implementing nature-connecting strategies in schools. In the doctrinal analysis of The Curriculum of Wales (2022), this flexibility could be seen to have both positive and negative outcomes. In this case, given Dunne's relevant position in academic fields implementing nature-connecting initiatives, his input can be seen to bolster the argument in favour of this flexibility's positive impact. He underscores his assessment of the document by highlighting its use of the Welsh term 'Cynefin' (meaning a sense of place) as its guiding principle that encourages schools to root their teaching in the local context. According to Dunne, this approach not only legitimises but actively promotes outdoor and nature-based learning. By allowing schools to integrate local history, geography, and environmental characteristics into their teaching, the curriculum helps bridge the gap between abstract sustainability principles and tangible, everyday learning experiences.

By highlighting successful projects that have taken holistic nature-based approaches to curriculum, Dunne adds further credibility to his insights into the receptivity of Welsh frameworks. For instance, he mentions a collaborative initiative in Pembrokeshire involving twelve schools, which used a polluted local river as a central theme. He described the project as ‘really successful’, and noted that it has since been reestablished with fifteen additional primary schools. The project examined the health of the river, whilst integrating historical and intergenerational knowledge by involving parents and grandparents. Such initiatives illustrate that nature-based learning can be multi-dimensional, merging scientific inquiry with social history and reinforcing both academic and environmental literacy. Examples like this help to further understand RQ 2, because they showcase nature-connecting projects that have been successful, and therefore supported by current frameworks, moving the investigation beyond theoretical discussions into practicality.

Further emphasising the practical integration of nature-connection in education, Dunne highlights that the proposition need not be all-or-nothing. He suggests that lessons might be ‘shifted' so that, even briefly, they incorporate outdoor activity. His approach advocates for flexible, incremental integration of outdoor experiences into the classroom. This pragmatic approach reflects a broader educational paradigm shift from purely didactic instruction toward experiential, inquiry-based learning (Singha and Singha, 2024). For example, he suggests that even a short outdoor activity at the end of a lesson can provide a meaningful opportunity for students to reconnect with nature. Discourse reveals that this notion is supported in research, highlighting that any amount of nature exposure is thought to be beneficial (Kuo, 2013) This approach also acknowledges the reality of practical constraints, such as weather conditions or the

additional logistical requirements for outdoor lessons, while still promoting the benefits of experiential learning, helping to not only further understand RQ 3, but to expand on how to overcome said barriers to implementation.

Another barrier Dunne acknowledges in his discussion is the requirement of nature-connecting strategies and outdoor learning, of additional resources and extra time needed for preparation. He expresses that these perceived barriers can often discourage teachers and schools from deviating from standard classroom routines. However, his continued reference to collaborative projects such as the one in Pembrokeshire suggests that inter-organisational collaborations, such as partnerships with local environmental projects and community stakeholders, can help to overcome resource limitations and logistical challenges. The doctrinal analysis revealed how the WBFGA (2015) emphasis on collaboration between organisations to achieve well-being goals, could be leveraged to support NDD addressing strategies, and this discussion with Dunne presents one potential area for this to be done. Dunne also highlighted the necessity of other external support, such as the partnerships he facilitates and the collaborative projects across multiple schools. Dunne highlighted how the networks play a critical role in facilitating change, and providing the necessary expertise, resources, and validation for innovative educational approaches.

Although Dunne's discussion of the need for Harmony approaches does not directly relate to any of the specific research questions, it does reinforce the study's initial argument that harmony and sustainable development are intrinsically linked. This insight provides further justification for considering Harmony as a guiding principle in this research. Dunne sums up this connection by stating: 'When a system is in

Harmony, it is healthy, when a system is healthy, it is sustainable'. He also relates Harmony to the idea of interdisciplinary learning and the move away from the dominant, siloed approach to lessons, which was previously identified as a barrier. He highlighted how the principles of Harmony naturally support the intersection of different fields of thought and the benefits this has throughout the transition from childhood. Lohmann and Welton (2020) made a similar comment on the importance of developing critical minds in education.

By outlining key ideas such as cycles, which support the notion of circular economies and continuous learning; diversity, which celebrates differences and enhances resilience; interdependence, which challenges the compartmentalised structure of traditional education; and adaptation and health, which emphasise the need for systems to adjust to their environments, Dunne presents a robust framework for transforming educational practice. Rather than solely addressing environmental degradation symptoms, the Harmony approach that Dunne sets out seeks to recalibrate the underlying relationship between humans and nature. As highlighted in the literature review, scholars such as Long (2024) consider this recalibration essential groundwork for sustainable, long-term change.

Additionally, Dunne highlights how the articulation of sustainable development principles through a nature-based principles of Harmony lens provides a language and structure for discussing sustainability in a way that is accessible to both educators and students. Some discourse highlights ethical concerns regarding the exposure of ecological challenges to children and the potential psychological harm, such as anxiety, it might evoke (Mercer, 2024). This approach provides an avenue that seemingly

mitigates those concerns by framing the purpose of NDD addressing strategies in positive principles of nature, rather than in environmental harm.

Surveys:

This section discusses the quantitative and qualitative findings from the survey and their broader implications within the research. Given time and resource constraints, obtaining a fully generalisable sample would have been challenging. Therefore, the survey was designed primarily to complement the insights emerging from the legal doctrinal analysis and the Dunne interview rather than to stand alone as statistically definitive evidence. Quantitative results should thus be interpreted with caution due to the limited sample size and the inherent biases associated with certain sampling methods that involve self-selection, which tend to attract participants with strong pre-existing opinions on the survey topics (Elston, 2021). However, this does not completely diminish the value of the quantitative results given the dearth of research in this area. This research represents the first known attempt to explore the nexus between NDD and teachers' perspectives on environmental sustainability within Welsh education. On top of that, the survey provides valuable qualitative insights that help to further triangulate the rest of the research findings.

A total of 62 education professionals who work across Wales participated in the survey. The dataset reflects both demographic diversity and varied professional experiences. The respondents predominantly worked within North Wales, with 35 out of 60 indicating that they are based exclusively in this region, with 20 in South Wales, a small group operating across the entire nation, and others choosing not to reveal this information. The age distribution among respondents is broad, with 32% falling in the 45–54 years

range, 22% in the 25–34 years range, 24% in the 35–44 bracket, 11% in the 55–65 years group, and 9% aged 18–24. 19% of participants had worked in education in Wales for 4-6 years, 16% had worked for 16-20 years, 16% had worked for 7-10 years, 14% had worked for 1-3 years, 14% had worked for over 20 years, 11% had worked for 11-15 years, and 6% had worked for less than 1 year. These demographic insights enrich the dataset, providing a cross-sectional view of opinions across different career stages and regions. Given greater research capacity, further analysis into connections between demographics and environmental opinions and insights would be worthwhile to understand any intercorrelations of the research.

In terms of professional roles, approximately 36% of respondents identified as classroom teachers, while an additional 38% worked in classroom-based settings in roles such as teacher assistants, HLTAs, or other support positions. This concentration of frontline educators underscores the relevance of the findings to everyday classroom practices and curricular decisions. These professions might also have more accurate insights given their frequent and direct engagement with the children. Had there been a greater sample to analyse, an interesting insight to observe would be whether the level of direct engagement with children correlated with any insights and opinions. When respondents were asked about the age groups they work with, 34% indicated they primarily engage with primary school-aged children (5–11 years), whereas 66% reported involvement with children in the secondary school age range. This division is critical, as perceptions of nature connection and sustainability may differ according to the developmental stage of students. In Wales, 85% of all schools are primary schools (Welsh Government, 2023), therefore, the sample under-represents this. However, it does pose questions as to why secondary school staff were more eager to respond to

the survey. Notably, Dunne's work involves Welsh primary schools and therefore his insights might not be as relevant to secondary schools.

Alongside the demographic information, the survey sought to gauge the personal commitment of educators to environmental sustainability. This was done to understand whether personal commitments affected opinions/ insights on NDD or school practices, results of which could indicate whether nurturing pro-environmental attitudes in staff would improve the effectiveness of strategies for children. 53% of participants indicated that they value environmental sustainability to a large extent, 38% indicated a moderate extent, and 6% indicated a small extent. However, only 19% of participants felt that sustainable practices were largely integrated into their daily lives, 66% indicated a moderate extent, and 11% indicated a small extent. These figures highlight a strong personal commitment to sustainability among the sample, but potential barriers to integrating sustainable practices daily.

45% of respondents considered themselves unfamiliar with NDD as a concept. An additional 35% stated that they had heard of the term but weren't familiar, 17% were somewhat familiar, and 1% were very familiar. As highlighted in the Methodology, this potential lack of awareness of the official term is why the survey asked questions about the symptoms of NDD that were identified through work such as Wang et al.'s (2021) NDD scale. Following that, when asked about the extent to which children spend time in nature, an overwhelming 79% of respondents reported that children engage with natural environments only to a small extent and 3% indicated not at all. Similar trends emerged when assessing children's environmental knowledge and emotional connection to nature; 72% felt that children's knowledge about nature was minimal and 11% felt it was

non-existent, and 74% believed that children have only a weak emotional connection to the natural world and 12% felt they had none at all. These findings greatly align with the literature on NDD and the prevalence of it in today's children.

Another important aspect of the survey was the practical aspect of incorporating nature-based activities into the classroom. When asked to rate their level of knowledge about incorporating outdoor learning or nature-based activities into classrooms, 9% indicated they had extensive knowledge, 45% indicated moderate knowledge, 24% indicated basic knowledge, 11% indicated limited knowledge, and 4% indicated no knowledge at all. Approximately 50% reported that they had received no formal training, although many expressed a strong desire for additional professional development opportunities. This gap in training underscores a broader systemic challenge: while educators recognise the importance of sustainability, they often lack the resources and support needed to implement innovative, nature-based approaches effectively. These insights reflect those from the literature review and interview discussions on the importance of teacher training and its persistence as a barrier to integrating nature-connecting approaches into schools.

Interestingly, 41% of respondents felt academic performances were prioritised over sustainability education or nature-connecting efforts to a large extent, and 30% felt to a moderate extent. When examining these results alongside demographic data, it was revealed that participants working exclusively in secondary schools were more likely to select one of these options, with only 1 participant from this group choosing the option ‘not at all’, and only 2 participants choosing the option ‘to a small extent’. These insights

highlight how priorities might shift as children get older in their education, perhaps indicating that primary schools would be more receptive to NDD-addressing strategies.

To further mitigate concerns about the sample size of the interviews, the results were compared to other similar studies: from Wales, the Welsh Government (2023) Review of Eco-schools; from England, the Reboot The Future (2023) report on creating a green education system; and from outside of the UK, with the Cebrián et al. (2022) study into progress toward embedding sustainability and the 2030 agenda. These specific studies were selected given their overlapping themes with this research, and their work directly with educators. All of the studies involved survey distribution among education professionals, and while not directly addressing NDD, they all cover topics on sustainability in schools in some form. Findings from these studies closely align with and reinforce those gathered from this research.

The Welsh Government (2023) report gained insights from 80 schools in Wales, Reboot the Future gained insights from 7000 educators in England, and the Cebrian et al (2022) study gained insights from 36 primary and secondary school principals from Spain. An interesting insight from the Reboot the Future Report (2023) was that when asked what values are currently promoted in schools, 83% of respondents said ‘achievement’, 69% said ‘conformity’, and when asked what values best equip young people for the future, 81% answered ‘kindness’, and 76% answered ‘connection’. These responses not only align with those found from this survey, but also help to validate the research in general, and the misalignment of goals and effective outcomes.

This survey’s question about the barriers to implementing nature-connecting activities into school activities allowed the survey to move beyond numerical data results with

open-ended responses. This qualitative feedback might be more significant for this research as its value is not impacted by the smaller sample size. These responses can also help to answer RQ 3 regarding the barriers to implementing NDD-addressing strategies in schools in Wales. Thematic analysis of these survey responses allowed for recurring sentiments to be grouped to get a better idea of pervasive barriers that are widely relevant rather than ones that might only be affecting one participant or school. While in practice it is still important to consider case-by-case circumstances, for the relevancy of this discussion, only recurring themes will be addressed.

The key areas that were identified as barriers were: the curriculum (or related to), for instance, rigidity, overcrowding, prioritisation of STEM subjects; pressure from standardised testing and academic performance prioritisation; resource restraints; insufficient funding; lack of appropriate outdoor spaces; and lack of student enthusiasm. These recurring themes from the survey responses greatly align with the literature review and the interview with Dunne. For instance, the lack of student enthusiasm could be seen to relate to discussions on digitalisation and social media. When considering these findings against those from the legal doctrinal analysis, it suggests that while the legislative framework in Wales is progressive, there is a disconnect between policy and practice at the ground level that needs to be overcome, something that was also confirmed in the literature review and interview with Dunne.

Findings from the compared studies further elucidated the challenges educators face in integrating sustainability into their practice. The Welsh Government (2023) Review of Eco-schools found that while there is significant enthusiasm for environmental initiatives among educators, persistent issues such as insufficient funding and limited

specialised training hinder the effective implementation of eco-friendly practices. Similarly, the Reboot The Future (2023) report revealed that only a minute fraction of teachers view current policies as adequate for fostering a transformative green education system; educators cited funding shortfalls, time constraints, and an inflexible curriculum as major barriers. Cebrián et al. (2022) also underscored that systemic challenges, such as overcrowded curricula, resource scarcity, and a disconnect between ambitious sustainability policies and their practical execution, are pervasive across different educational contexts. Collectively, these findings reinforce the findings of this study, that although there is widespread recognition of the need to embed sustainability within education, significant obstacles remain.

A point of convergence between this research's three data sources is the recognition that while policy frameworks in Wales are supportive of sustainability in principle, the practical implementation of nature-based learning remains uneven. The legal analysis demonstrates that the legislative intent is to foster long-term, intergenerational well-being. Yet, the interview and survey responses reveal that many educators feel constrained by a system that prioritises academic outcomes over holistic development. This misalignment suggests that, for Wales to fully capitalise on its progressive policy landscape, there must be a concerted effort to bridge the gap between legal mandates and classroom practices. An interesting observation is that discourse from the literature review, such as Dunne and Martin (2020) suggests that nature-connecting strategies would actually have a positive impact on academic performance, given things such as child and teacher well-being, enjoyment and engagement.

The survey further supports findings from the literature review and interview on the prevalence of NDD, the disconnect between policy and practice, and several of the perceived barriers to implementation. A major point they have highlighted is that without adequate training and support, educators are unlikely to be able to implement the kind of transformative practices needed to address NDD. This point is critical, as it suggests that future policy initiatives should not only set ambitious sustainability goals but also provide the practical means, through funding, training programs, and infrastructural support, to achieve them. While having a seemingly progressive environment framework is a promising start, it is ornamental if it is ineffective.

Future Research Recommendations:

Throughout the paper, several limitations in the methodology have been identified, alongside areas where further development could significantly enhance the outcomes. As the first known study linking NDD with school-based strategies, to address the underlying cultural and societal causes of the ecological crisis, this research lays a robust foundation and makes several unique connections. However, to further bolster these findings, several refinements are recommended.

Firstly, while the mixed-methods approach, comprising legal doctrinal analysis, a semi-structured interview with Richard Dunne, and a survey of 62 Welsh educational professionals, provided valuable insights, it could be expanded. Incorporating additional relevant documents into the legal doctrinal analysis would strengthen the foundation of the study. Given the overlapping nature of various policies in Wales, future research could examine other critical texts, such as The Environment (Wales) Act

(2016) and certain international legal frameworks, to offer a more comprehensive legal perspective.

Secondly, Dunne's strong alignment with the study's themes, like his emphasis on Harmony, his work with Welsh primary schools, and his documented recognition of NDD, made him an ideal candidate for interview for this research. However, Dunne himself noted the value of engaging with other professionals in the field. Extending the interviews to include additional voices, such as government officials, head teachers, and other educational practitioners, would provide a broad spectrum of perspectives, thereby enhancing the validity and richness of the findings.

Thirdly, the survey's distribution via email, while efficient, proved to be an impersonal method that likely contributed to a lower response rate (as highlighted by Artino, Youmans and Tuck, 2022). Future studies should consider more direct engagement strategies. For instance, establishing partnerships with local authorities and directly liaising with schools could foster more personal relationships and thereby encourage higher participation rates. Better outreach methods might not only increase the sample size but also diversify the respondent pool, lending greater statistical power and generalisability to the survey results.

Finally, the analysis of the survey data would benefit from a more nuanced exploration of correlations between demographic variables and responses. Such an analysis could help illuminate how different factors influence perceptions of NDD and sustainability practices. Future research might also adopt a longitudinal design to track changes over time, enabling a deeper understanding of how these educational strategies evolve and impact the broader ecological goals, as suggested by Dunne. By addressing these

limitations, subsequent studies can significantly advance the understanding of NDD and its role in shaping sustainable educational practices.

Conclusions and Recommendations:

This research has examined the potential of addressing NDD in children through the integration of nature-based educational frameworks within Wales's progressive sustainability agenda. It follows the perspective that challenging the entrenched mechanistic worldview underlying the current ecological crisis can contribute to long-term transformative solutions that support ecological goals. Through a legal doctrinal analysis of two key instruments—the Well-being of Future Generations Act (WBFGA, 2015) and The Curriculum for Wales (2022)—combined with qualitative insights from an interview with industry professional Richard Dunne and survey responses from 62 Welsh educational professionals, the study highlights the expansive benefits of reconnecting children with nature, including the potential to support broader sustainability efforts. This study has also identified several suggested avenues for improved effectiveness of relating Welsh policies.

Reflecting on the broader implications of this research, it is necessary to acknowledge its limitations. As previously highlighted, the study's scope was constrained by time and resources, which affected the sample size and diversity of perspectives captured. Expanding the methodology to include additional documents, interviews, and survey participants would further solidify the findings. Notably, this study did not incorporate children's perspectives. Future research that embraces the 'nothing about us without us' principle (Rahman *et al.*, 2022), ensuring that children's voices are included, could

add another dimension to this study that has not yet been explored. This would provide a more holistic understanding of how such interventions impact children's learning experiences, and environmental attitudes. Addressing these limitations will be crucial for subsequent studies seeking to build on this work, particularly those aiming to develop a more comprehensive, cross-cultural model of nature-based education. That being said, this research's novel intersection of inquiry provides a valuable foundation, and the benefit of pioneering inquiry cannot be understated.

This research initially set out to address three core research questions. Its use of the selected methodology allowed for it to remain focused on these questions throughout the research. Here is a summarised response to each of the questions:

RQ 1**:** The findings assert that addressing NDD in children has significant potential to support efforts to mitigate the ecological crisis by fostering pro-environmental attitudes and developing intrinsic motivations for environmental stewardship. This approach directly challenges the entrenched mechanistic worldview that underlies the ecological crisis.

RQ 2**:** The WBFGA (2015) and The Curriculum for Wales (2022) provide a supportive backdrop for strategies that address NDD. However, a significant gap remains between policy and practice, and improvements are necessary to ensure the effectiveness of supportive policies.

RQ 3: The main barriers to implementing NDD strategies in schools include rigid curricular demands, limited teacher training, infrastructural constraints, and resource and funding limitations. The main enablers include Wales's progressive policy landscape and the enthusiasm of both teachers and children.

These findings will now be explored further:

This research underscores that reconnecting children with nature can yield long-lasting benefits that extend into adulthood. Early experiences with natural environments are strongly linked to the development of pro-environmental attitudes and behaviours later in life. As such, nature-based educational interventions function as a form of preventative public health, addressing both cognitive and emotional deficits associated with NDD while also preparing future generations to tackle the ecological crisis. These interventions may also have a cascading effect within families and communities, as children who develop a passion for nature may influence the environmental practices of their social circles. This phenomenon has profound implications for both local and global sustainability efforts. By framing nature-connection as a cornerstone of lifelong learning and civic responsibility, this research presents a fresh perspective on sustainable development that prioritises relationality and long-term systemic change over short-term symptomatic remedies.

However, a crucial consideration is whether innovations in Wales can meaningfully contribute to global sustainability efforts, with Wales's relatively modest contribution to environmental degradation compared to other places (for instance, see, Worldometer, n.d.'s insights from 2022). While Wales alone cannot address the ecological crisis, its initiatives can serve as a replicable model for other regions. Policy diffusion suggests that innovations like these can act as catalysts for broader global change. Wales's progressive landscape, particularly the WBFGA (2015), has already influenced other regions (The Future Generations Commissioner for Wales, n.d.), underscoring the potential of these strategies to contribute effectively to broader goals. However, findings

may differ in contexts with less supportive policy environments, necessitating further research on the feasibility of similar initiatives in less environmentally progressive regions.

Additionally, projects like those conducted by Dunne have embraced the concept of Harmony, but implementing such ideas may encounter resistance in less receptive environments (Fitz-Henry, 2021). Therefore, a potential barrier occurs when considering the global potential of NDD-addressing strategies. In regions that might be more receptive to concepts like Harmony, like areas where indigenous traditions already promote a deep connection to nature, such initiatives arguably have less impact. As suggested throughout this research, the explicit mention of terms like Harmony can be omitted to mitigate these concerns, but the epistemological position of these projects may still cause contention. However, pioneering strategies in Wales can still provide valuable insights into the broader benefits of nature-based education, offering personal advantages for the Welsh public while also laying the groundwork for further research on global applicability. To maximise impact, further exploration is needed on how these innovations can be implemented in less accepting and more environmentally harmful societies.

This research demonstrates that educational settings in Wales have the potential to serve as vital intervention points for mitigating NDD, supported by the country's environmentally progressive legal framework. However, systemic barriers, including rigid curricular structures, limited teacher training, infrastructural constraints, and resource limitations, perpetuate a disconnect between policy and practice. Addressing these barriers requires targeted policy reforms. Wales's legal framework, as determined

by the legal doctrinal analysis, provides a strong foundation, but making the policy more explicit in operational terms could significantly enhance the implementation of nature-based interventions in schools. For example, revising the Curriculum for Wales (2022) to mandate a minimum number of outdoor learning hours would establish tangible benchmarks for environmental engagement, without compromising the flexibility of the framework that is heavily praised. Additionally, fostering partnerships between schools and local organisations to support specific nature-connecting education targets, through the WBFGA (2015), could help overcome resource and logistical constraints.

It has been clear that these amendments must be implemented alongside comprehensive teacher training to ensure the effectiveness of the strategies. This research has highlighted the enthusiasm of educators for such training and emphasised the importance of teacher engagement in the success of these initiatives. With these changes in place, improvements should be observed in student and teacher well-being, teacher retention, student engagement, and academic performance. These factors provide valuable incentives for the continued implementation of nature-based strategies, and could help to influence other regions to implement similar strategies. These insights have also highlighted the expansive nature of NDD addressing strategy benefits that benefit the local people as well as potentially global environmental efforts in the long term.

The integration of nature-based learning within existing curricular frameworks also raises important questions about the future role of formal education. Traditional pedagogical models, which rely heavily on standardised testing and classroom-based instruction, are increasingly being challenged by the need for experiential, holistic

learning approaches (Munna and Kalam, 2021). This study demonstrates that nature-based strategies can disrupt conventional educational paradigms, encouraging educators to reimagine the classroom as a dynamic, interactive space that extends beyond four walls. Such a shift not only addresses NDD but also cultivates creativity, critical thinking, and a deeper sense of place among students—these things have been consistently commended in discourse (for example, Lohmann-Hancock and Welton, 2020). This transformative potential is particularly significant in an era where global challenges such as climate change and biodiversity loss demand innovative, interdisciplinary responses. By positioning outdoor learning as central to the curriculum, educational institutions can play a pivotal role in shaping a future where sustainability is not just an aspirational goal but a lived reality.

Finally, this study highlights the need for ongoing dialogue between policymakers, educators, and community stakeholders. Bridging the gap between policy and practice requires not only technical adjustments, such as revising curricula and enhancing teacher training, but also a fundamental shift in societal values. By fostering cross-sector collaborations and encouraging collective problem-solving, Wales can develop a more cohesive and effective strategy for addressing NDD. Such partnerships are essential for mobilising the resources and expertise needed to implement innovative educational practices on a larger scale. Ultimately, these efforts can contribute to a broader societal transformation in which the principles of Harmony and sustainability are deeply embedded in everyday life.

In conclusion, this research has laid a strong foundation for understanding how innovative strategies that move beyond solely symptom-based approaches, can be

implemented to combat the ecological crisis by moving away from solely symptom-based approaches. In particular, it has elucidated how Wales's legal landscape can be leveraged to support such innovations. The evidence suggests that, by embracing a collaborative and legally anchored approach to nature-based education, Wales can not only mitigate NDD among its youth but also catalyse broader societal shifts toward sustainability. As policymakers, educators, and community stakeholders build on these insights, Wales's approach may serve as a replicable model for other regions seeking to bridge the gap between policy and practice. Ultimately, this research contributes to discourse that is paving the way for a more harmonious and sustainable future.

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Appendices:

A:

Declaration Form

Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Master's Degrees Dissertation

Declaration Form.

1. This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

2. This dissertation is being submitted in partial fulfilment of the requirements for the degree of Harmony and Sustainability: Theory and Practice

3. This dissertation is the result of my own independent work/investigation, except where otherwise stated. A reference list is appended.

4. I acknowledge the use of Grammarly on 18/03/2025 to proofread my work.

i. I confirm that I have not presented any AI generated text as my own work. I confirm I have copies of my drafts, notes, and other resources I used before, and after the use of AI tools which I may be asked to provide in evidence.

5. I hereby give consent for my dissertation, if accepted, to be available for photocopying, inter- library loan, and for deposit in the University's digital repository

Signed (candidate).....

Date.....26/03/2025.....

Supervisor's Declaration.

I am satisfied that this work is the result of the student's own efforts.

Signed (Supervisor).....

Date.....26/03/2025.....

B: The Survey

This survey is part of a dissertation study exploring how childhood connection and engagement with nature are perceived and addressed within schools in Wales. The study is specifically looking at children between the ages of 5 and 16. Your responses will help inform this research. Participation is voluntary, and all answers will remain confidential and anonymous. You may skip any question or withdraw from the survey at any time by exiting the form. Please note, the data we receive from the survey submissions are anonymous. Therefore, it will not be possible to identify and remove your data after submission.

Some questions may touch on topics such as environmental issues, school practices, and children's welfare, which could evoke concerns or reflection. Please note that this study focuses on understanding perspectives and practices rather than evaluating specific schools. Support information, including details about climate cafés where you can discuss concerns related to environmental or community well-being, will be provided at the end of the survey.

This study has been reviewed and approved by the University of Wales Trinity Saint David's ethics committee to ensure it meets high ethical standards.

If you have any questions or require further information, please contact Jennifer Williams [redacted] By proceeding with this survey, you consent to participate in the study.

Section 1: Personal Details

The following questions situate you within the educational framework and aim to understand your personal values and perspectives on the environment. Your responses will help provide valuable context for the study.

1.Please confirm your consent to participate in the study and your commitment to answering questions honestly and accurately to the best of your knowledge. (Required)

I confirm

2.Do you work in education in Wales?

Yes

No

3.What county do you work in?

4.What is your age?

18-24

25-34

35-44

45-54

55-64

65+

5.What is your role in education?

Classroom teacher

Administrator

Teaching Assistant/ HLTA

Senior Teacher (e.g., Deputy Headteacher)

Support Staff (e.g., Learning Support Assistant)

Additional Learning Needs Coordinator (ALNco, includes SENco)

Local Authority Education Officer

Education Consultant

Governor

6.What age children do you specifically work with. Please select all that apply

All primary school ages

All secondary school ages

Ages 5-6 (Year 1)

Ages 6-7 (Year 2)

Ages 7-8 (Year 3)

Ages 8-9 (Year 4)

Ages 9-10 (Year 5)

Ages 10-11 (Year 6)

11-12 (Year 7)

12-13 (Year 8)

13-14 (Year 9)

14-15 (Year 10)

15-16 (Year 11)

7.How long have you been working in the education in Wales?

Less that 1 year

1-3 years

4-6 years

7-10 years

11-15 years

16-20 years

Over 20 years

8.To what extent does your work involve direct engagement with the children?

A large extent

A moderate extent

A small extent

Not at all

I'm not sure

9.To what extent do you value environmental sustainability?

A large extent

A moderate extent

A small extent

Not at all

I'm not sure

10.To what extend are sustainable practices apart of your daily life?

A large extent

A moderate extent

A small extent

Not at all

I'm not sure

11.How familiar do you consider yourself to be with Nature-deficit disorder?

Very familiar

Somewhat familiar

I've heard of it, but not familiar

Not familiar at all

Section 2: Children's Connection to Nature

The following questions explore your insights into childhood connection with nature. Your answers will support this research in understanding current children's

engagement with the natural world.

Please answer based on your experience working in education in Wales.

12.To what extent do you believe children today spend time in nature?

A large extent

A moderate extent

A small extent

Not at all

I'm not sure

13.To what extent do you believe children today are knowledgeable about nature (e.g., knowing native plants, animals, or where food comes from)

A large extent

A moderate extent

A small extent

Not at all

I'm not sure

14.To what extent do you feel children today are emotionally connected to nature (e.g., a sense of belonging, appreciation, or care about the natural environment)

A large extent

A moderate extent

A small extent

Not at all

I'm not sure

15.To what extent do you feel children today have access to the natural world (e.g., accessible green spaces)

A large extent

A moderate extent

A small extent

Not at all

I'm not sure

16.To what extent do you feel children today show an interest in connecting with nature (e.g., enthusiasm for outdoor activities, curiosity about the natural world, or a desire to spend time in natural settings)

A large extent

A moderate extent

A small extent

Not at all

I'm not sure

Section 3 : School Practices

The following questions involve your current work practices that affect the children you work with. Your input will help us better understand how schools support children's engagement with the natural world.

Sustainability education involves teaching children about the environment, sustainable practices, and how their actions impact the planet. Examples include:

- Classroom lessons on climate change or energy conservation.
- Activities like recycling initiatives or creating eco-friendly art projects.
- Promoting habits such as reducing waste or saving energy.

Nature-based activities aim to connect children with the natural world to foster their well-being and environmental awareness. Examples include:

- Outdoor learning sessions in natural spaces.
- Gardening projects or tree planting.
- Exploring local wildlife or organising nature walks.

17.How would you rate your level of knowledge about incorporating outdoor learning or nature-based activities into classrooms?

Extensive

Moderate

Basic

Slim

None at all

I'm not sure

18.Has your place of work provided any professional development or training on sustainability and/or environmental education?

Yes, extensive training

Yes, some training

No, but I'd like training

No, and I'm not interested

I'm not sure

19.How important is it for you to prioritise sustainability and environmental education in the work you do that affects children?

Extremely important

Somewhat important

Neutral

Somewhat not important

Extremely not important

20.How important do you think your place of work finds it to prioritise sustainability and environmental education in practices that involve or affect the children?

Extremely important

Somewhat important

Neutral

Somewhat not important

Extremely not important

21.To what extent do you feel efforts to improve academic performance are prioritised over sustainability education or nature-connection efforts?

A large extent

A moderate extent

A small extent

Not at all

I'm not sure

22.How practical is it to implement sustainable practices into your daily work activities that affect children

Extremely practical

Somewhat practical

Neutral

Somewhat impractical

Extremely impractical

I'm not sure

23.What do you see as the key barriers to implementing sustainability education or nature-based activities for children?

24.What current practices does your place of work implement that incorporate sustainability education or nature-based learning for children?

Thank you for your participation!

If you are interested in learning more about fostering connections with nature or addressing concerns related to environmental well-being, you may find the following resources helpful:

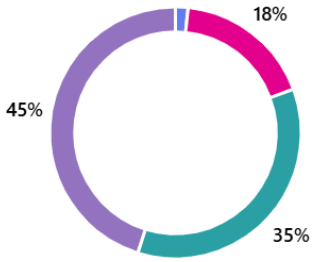
- Climate Café Network – A space for supportive, informal conversations about climate and community well-being. (https://climate.cafe/climate-cafe-locations/europe/wales/)
- The Harmony Project- An education charity working with schools and educators in the UK and around the world to help integrate principles of nature into the curriculum. (https://www.theharmonyproject.org.uk)

This study is not designed to address safeguarding concerns or evaluate specific school practices. If you have specific concerns about children's welfare, please consult appropriate resources or support services available in your area.

C: Survey Responses (excluding certain ones in line with GDPR Regulations such as demographic information)

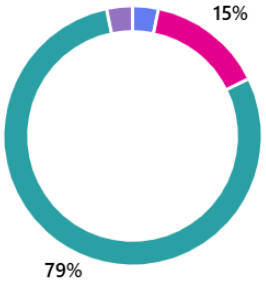
11. How familiar do you consider yourself to be with Nature-deficit disorder?

Very familiar	1
Somewhat familiar	11
I've heard of it, but not familiar	22
Not familiar at all	28



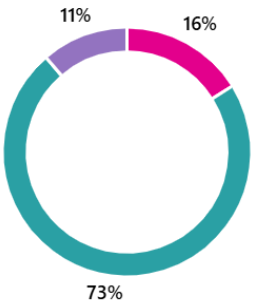
12. To what extent do you believe children today spend time in nature?

A large extent	2
A moderate extent	9
A small extent	49
Not at all	2
I'm not sure	0



13. To what extent do you believe children today are knowledgeable about nature (e.g., knowing native plants, animals, o r where food comes from)

A large extent	0
A moderate extent	10
A small extent	45
Not at all	7
I'm not sure	0

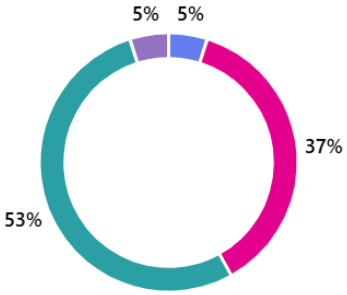


14. To what extent do you feel children today are emotionally connected to nature (e.g., a sense of belonging, appreciation, or care about the natural environment)

A large extent	0
A moderate extent	8
A small extent	46
Not at all	8
I'm not sure	0

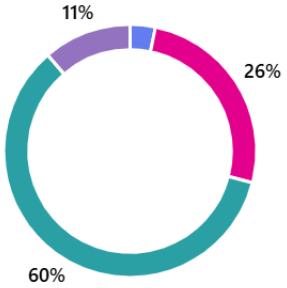
15. To what extent do you feel children today have access to the natural world (e.g., accessible green spaces)

A large extent	3
A moderate extent	23
A small extent	33
Not at all	3
I'm not sure	0



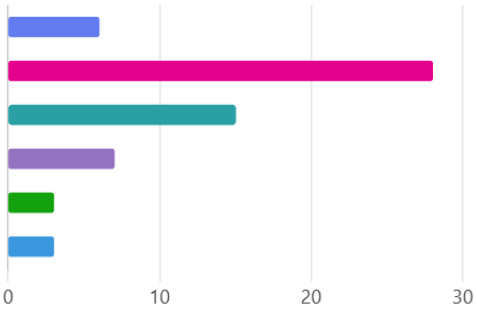
16. To what extent do you feel children today show an interest in connecting with nature (e.g., enthusiasm for outdoor activities, curiosity about the natural world, or a desire to spend time in natural settings)

A large extent	2
A moderate extent	16
A small extent	37
Not at all	7
I'm not sure	0



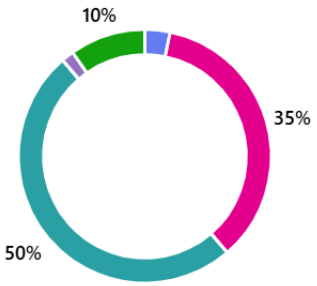
17. How would you rate your level of knowledge about incorporating outdoor learning or nature-based activities into cla ssrooms?

Extensive	6
Moderate	28
Basic	15
Slim	7
None at all	3
I'm not sure	3



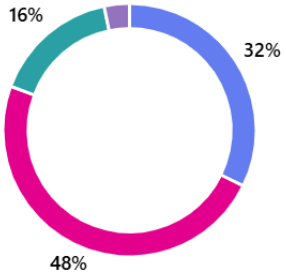
18. Has your place of work provided any professional development or training on sustainability and/or environmental ed ucation?

Yes, extensive training	2
Yes, some training	22
No, but I'd like training	31
No, and I'm not interested	1
I'm not sure	6



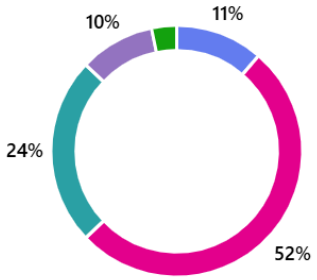
19. How important is it for you to prioritise sustainability and environmental education in the work you do that affects ch ildren?

Extremely important	20
Somewhat important	30
Neutral	10
Somewhat not important	2
Extremely not important	0



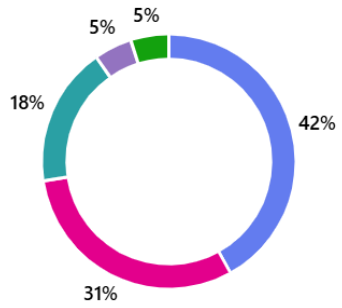
20. How important do you think your place of work finds it to prioritise sustainability and environmental education in pra ctices that involve or affect the children?

Extremely important	7
Somewhat important	32
Neutral	15
Somewhat not important	6
Extremely not important	2



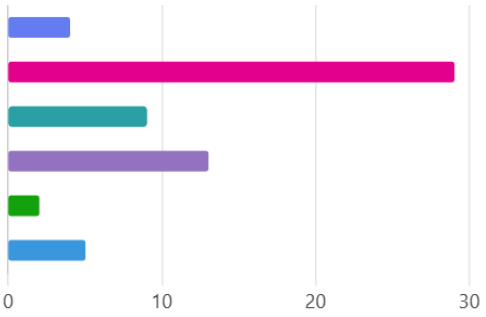
21. To what extent do you feel efforts to improve academic performance are prioritised over sustainability education or n ature-connection efforts?

A large extent	26
A moderate extent	19
A small extent	11
Not at all	3
I'm not sure	3



22. How practical is it to implement sustainable practices into your daily work activities that affect children

Extremely practical	4
Somewhat practical	29
Neutral	9
Somewhat impractical	13
Extremely impractical	2
I'm not sure	5



23. What do you see as the key barriers to implementing sustainability education or nature-based activities for children?

D:

Richard Dunne Interview

R= Richard Dunne I= Interviewer

I: So, I'm doing a dissertation project on the potential of addressing nature deficit disorder in children as a means of combating the ecological crisis through altering public perception and kind of nurturing the next generation's attitude towards the environment. I know that you have done like an awful lot of work with school curriculums. So basically, I was just hoping I could ask you a few questions and we could just yeah

R: Yeah, that's you fine. and it's absolutely the work that we are doing. So hope things that I can share are very relevant to what you're exploring, which is really important. I'm just going to find a quote, because I was speaking to someone earlier this week, I can find it, and they said if people don't know about understand or love nature, they are not going to care for it.

I: A hundred percent. That's really what the whole thing's about.

I: So, just before we begin, I just want to say, thank you for agreeing to participate in this interview. I just want to confirm that your participation is voluntary and that you can withdraw any time or you don't have to answer any questions if you don't want.

R: Yes

I: And I also just want to confirm that you're okay with your name being used in the research.

R: Yeah.

I: Perfect. Are there any questions you want to ask before we begin?

R: No, all good. looking forward to the questions.

I: Based off your experience, how prevalent would you say nature deficit disorder is among children today?

R: Well, I don't have the specific data on it, but my perception and my sense, and I will I will probably look here in England particularly because that's what I'm based, but of course I am working in Wales as well so they're probably my two reference points, but my sense is that partly because of the way the curriculum works in schools, which is very classroom based generally and very well, certainly here in England, very pressurised around data. Schools therefore don't want to they almost see learning and nature or outdoor learning as a distraction from the real learning. They wouldn't see it as just a better actually sometimes just a better way of learning. So I think that is one challenge that the actual education system is not enabling this kind of learning. I think on the other side as you know so well, for a lot of young people, whether it's younger children and just having a screen in front of them, uh on a tablet or even on a, you know,

them their parents' phone, and obviously has to get older than having their own screens. I think it's a massive, massive distraction and in fact, there's an event next week I can even send you the link. It's written voice about this whole world of what's called the anxious generation and it's looking at, you know, really, really concerning data around young people and lack of well-being and depression and lack of purpose coming out of living just on screen social media, you know, flicking, clicking, whatever. So I think that is the the other backdrop and probably the bigger backdrop, that if you've got one of these in front of you, you know, you're you've drawn into that world.

I: Yeah, massively. That sounds like a really interesting thing. If you wouldn't mind sending me over the link. Okay, could you please just describe the project that you're currently undertaking as part of the harmony project in in a hole and also more specifically with Welsh primary schools?

R: So I think the positive, particularly with Welsh primary schools, is that the new curriculum for Wales is much more owned, I think, by schools. It's about saying you develop a curriculum that works for your school in your village or town or city and for your community of people so there is a lovely word which you'll pronounce better than me. I think it's cae-nef-in, is it, which means or is CYNEFIN C Y N E F I N, and that means a sense of place. So it's a really lovely word. It's a very beautiful Welsh word, and I think it's a driver for a lot of what's what learning is about and Wales So I'm in I'm hopeful that with that message of schools being invited to make learning relevant to their local context, its history, its geography, its landscapes, its nature, its people, its communities, you know, building around that, you're going to get much more opportunity for learning in in the world around you. Ie a significant part of that hopefully in nature. So our work is

very complementary to that. So if I give you one example, not that far from where you are, in Pembrokeshire and particularly around Haverford West, where we've done a really lovely project with a consultant who maybe you should even speak to called [redacted] with a [redacted] and [redacted] is a consultant in education and she loves the work of the harmony project and she is translating it into a Welsh curriculum context. If I give you the specific example, she's just run last summer a really lovely project on on the local river the cleve river it's two rivers that come into one and the Cleve river is is a sick river. It's sick because of sewage and it's sick because of industrial farming dairy farming so cheap cheap food has a cost and industrial farming systems give us cheap food, but it usually has a cost of the environment and it usually has a cost to us ultimately if we're eating poor quality food so they've done a project. They did a project last summer, Jane did with 12 schools using our curriculum on rivers and exploring the story of their river, the health of their river, actually the sickness of their river. But also learning from their parents, grandparents about what the river was like when they were children. So that had a really nice historical element. That project was really successful. It had an exhibition in the summer at a community center with the children's work. There loads of examples you could probably reference them actually because it's a really great project. And Jane has just established a second cohort of 15 more primary schools, wanting to do the same project. And now we're building rivers into oceans and we're looking at woodlands and rainforest, the rainforests of Wales, temperate rainforest, so there are a lot we're basically taking in lots of different directions. So it's I would set, it's bringing the curriculum for Wales to life.

I: Yeah, it's honestly, it sounds really a fascinating and I I actually learnt quite a bit about it in my modules and um last year and like that's why I was so eager to kind of do this interview because it's really amazing work.

R: Well, yeah, I don't know if you want to speak to [redacted], but let me know at some point because she's very, very interesting and she's really passionate about this work as well.

I: Yeah, I'm absolutely open to using all of your networks if you can pass on my details. The next one is, could you please outline the key strategies or approaches that you use to connect students with nature?

R: Yeah, I think it's quite simple really. We're trying to look at and we're trying to help teachers see how they can take a lesson which might be just in a classroom into a lesson that has an element of nature connection or outdoor learning. Now we know that some teachers probably quite a lot of teachers don't really want to do that because they're here just sitting in in the classroom with their their class. But actually, if we can shift it and it may only be a short thing, it might be at the end of the lesson to just go out and do something outside in a circle. It might be a short activity to look for something or to you know do a little bit of research or something investigate something. So we're trying to give teachers as many opportunities as realistically possible to get a better balance between the classroom based learning and nature connection. We know the reality, of course, if you're taking children outside in the autumn day, you know, they've got to put their coats on, they may have to change their shoes. You know, it's about the hustle. So we are realistic about about that and we're saying it's not all the time, but we're trying to shift the balance. So there's more opportunity for that, particularly in the

in the nicer weather. So in in the summer months, that's the intention. So basically our lessons and our planning is trying to encourage teachers to do more of them.

I: Okay. Thank you. What are the main challenges you faced in implementing nature-based principles of harmony into school curriculums?

R: My background has been in primary education for many, many years, and I was a head teacher for 18 years, so I'm very aware of the need to make messages simple and easy to understand because if you're speaking to a group of primary age children, they've got to be really easy to understand. So I think we try really hard to make the message of harmony easy to understand, but the challenge is the mindset because, you know, schools do a lot of learning in very subject siloed ways so you do a mass lesson and you do a language lesson, then you do a history lesson, then you do an art lesson and so on science, etc. And often the link the link between them isn't there. So you jump one thing to the next. The next is quite random, actually as a child and you'll know this. As a child you're thinking, okay, I just did that and I'm doing this and I'm doing that. I'm kind of all over the place so we are trying to get teachers to move away from that kind of learning to something that's more coherent and joined up. So it makes sense. But the challenge is here getting people to think in a different way. I think, again, the curriculum of Wales is probably helping because it's not so subject specific. It's more around areas of learning. So I think that's helping, but often you have to almost get teachers to unlearn something to learn it.

I: Yeah, I really love that approach. I read about it and I think the first time was in uh the harmony debates and I think you spoke about asking a question like what is health and

approaching it from all the different subjects. And I think that is just an amazing way that everyone should be doing it.

R: Right, and I think if you take the theme or the question as the starting point, and then you draw in the elements that can enable an understanding of the question all that inquiry. It's a really lovely way for all of us to learn. I mean, not just children. I mean, it makes sense for us as adults to learn.

I: Right, that is life though, isn't it? Like you never spend your everyday life, in all these compartments, like everything is so interconnected. When I read it, I was like that just makes so much more sense. Like 100%.

R: I think that's it. It's about making learning makes sense. I mean, that's kind of our mantra to make learning makes sense for children because we want them. I mean, of course they're going to have a a disconnected or disjointed view of the world if they learn always in these different silos. So to see what you just said, the interconnectedness of things.

I: Yeah. Okay, so in your work at the Ashley Church of England primary school where you were the head teacher, um the work you did that I read that you had uh you you basically observed measurable outcomes after you did your work with the curriculum through like SAT results. And I'm just wondering if you've been able to observe any measurable outcomes with the students that you're working with in Wales

R: I think at this point, it's difficult to measure in a data sense um because you would really need to do a probably quite long-term study you can't get data over you know six weeks half a term you probably need to be working with schools and children for maybe

even a year or two years to really start to see the impact, but I think what we would explore would be attainment as one area so is it improving their understanding and their learning? The second will be wellbeing so are they enjoying their learning more because they're outside the classroom rather than inside and the third link to that is around attendance, particularly with children who struggle in school. So if they, you know, they might be children with a particular need, but if they're not coming into school regularly or consistently, we might see that they like coming in because they know they're going to do learning that's not as it usually is. So they're probably areas. I think the other area that's quite interesting is retention of staff because a lot of teachers, I think across the board, you know, in Wales and England are quite stressed by their workload, by managing behaviour, by managing parents, by all of those different areas. So if this can help them to enjoy learning more and therefore retain them, that's also good.

I: Yeah, absolutely. Another part of this has been giving out a surveys to teachers, who aren't part of any sort of project and we just um in Wales. And I happen to just have like a crazy amount of teachers in my family, which has been quite useful, but um, what you're saying like about, um the stress and stuff, um, I think you don't realize until you kind of really engage with these people, like a a lot of teachers and the whole school system just seems to be really struggling at the moment through, like, major stress, so it's I mean, stuff like this is not really difficult in some ways in terms of like resources, it's not super difficult to put these into schools and if it helps with that stuff, like there's it's almost like infinite um positives from it.

R: One of our teachers said to me last summer, I feel like I've got my mojo back because they were using this curriculum and she said I just feel like I like learning again. I like

being a teacher again and so we need that that love of learning and that joyfulness to come through the teacher. If the teacher's not enamoured with it or enjoying it, then it's going to be really hard for the children to be the same. So I would say, and, you know, when I was a head teacher, it was always about making sure my teachers were okay because if they're okay, then hopefully the learning will follow.

I: Okay. So I know you've spoke a little bit already about how the Welsh educational policies and stuff are quite useful, you've kind of touched on it, but well, this question just basically says, do you think that the principles of sustainability are effectively embedded in the current educational policies in Wales?

R: I love the wellbeing of future generations Act and I think that is a fantastic driver for everything that hopefully Wales now stands for and wants to do and I think Jane Davidson, who was at the University of Wales, uh she she was the one who pushed for that act to come through. She was very involved with this sustainability education. And I think it's visionary. I think it's an amazing thing to have done. so everything now is of course about well-being a future generations, both children and young people, but also about the future of the land nature, etc. So it's a very inclusive statement and act and I think that is such a driver now and guide for what people do. Probably the challenge still is getting people to really understand what that means and because you are now in Wales moving from the older system of what you did do to the new system of what you can now do with a curriculum for Wales, there is this this still this transition. People are still moving for one system into another and maybe in some cases not really moving very much. So that's what we're as I mentioned earlier, that's what we're hoping that our

harmony curriculum can do is to provide a framework that really sits very well within the curriculum for Wales.

I: So obviously, as I mentioned, um the research that I'm doing is looking at how this can be um how it could support the ecological crisis and so we it's looking at how it could be fully embedded within the educational framework rather than just like a handful of schools or whoever like want to join it and like we want it to kind of be part of the whole all of the policies. So just based off your experience in Wales, um what do you think are the key enablers and barriers to fully embedding it within education?

R: What we have to do, which is what we've been discussing, which is to be really clear about what the learning themes are ideally themes that are related to nature and the world around them and then to plan learning that connects into that and you can still have rigor. You can still have high academic attainments around that but it just makes learning more purposeful and if we can give young people children more opportunities to have a relationship with that world and start to actually really fall in love with it and be excited by it and be excited by seeing a butterfly or a beautiful flower meadow or just by being by the river or by the sea, collecting shells on the sea and different shames and whatever it is, the more they can do that and really connect to that the better. So I think again, it's this balance. It's not saying you can't be academically strong, but it is saying you can do it in a better way. And if you get that right then children will have a relationship with the world around them and then they'll care about it.

I: Yeah, well, that is all my questions. I suppose that I was wondering if there's anything that you feel um is relevant that I haven't asked about or anything that you wanted to add but otherwise that was me done.

R: I think the message now is what are schools or the question now is what are schools really doing? So if I give an example of a conversation I had just two days ago, there's a new school here in the Midlands in England that was burned down by an arson attack about three years ago. So they rebuilt the school and it's this beautiful biophilics school, a school that has all the design of which has been inspired by nature. So my question and I don't know the answer yet, I'm actually going to see the school in a couple of weeks' time is it's great you've got a beautiful new building and you've got a really nice eco nature to friendly design, but what's the learning You might have this amazing setting, but is the learning about nature inspiration nature connection or my view from just looking at their website now curriculum plants is it's not but well and I don't want to judge yet. So for me the question for you, I think is what actually is happening in these schools to prepare them to be leaders of a sustainable future? So when I was a head teacher, we used to take our students on an expedition to showman in the Alps. And we got funding for it locally to support families who may struggle would struggle with the cost. So we got the train to Paris. We went down to Anac and then we went on a coach into the mountains, the Alps. And on the first day we said, what do you need to be well? So let's explore that. They did amazing rock climbing on this beautiful rock face and they realized that, you know, alongside eating well, being safe, having clean water, that their wellbeing was also about realizing their potential, you know, caring for the world and for each other, all that kind of thing. The second day we said, okay, we're going to go into the mountains now we're going to track and we want to ask you to think about team welding. How do you make sure a team is well so obviously, you know, trekking the tmountains hard work, you know, you get fed up, you get tired, but what is it that keeps us going supports us being positive, you know singing a song, whatever it is. um and

then the third day was to say what's our world need to be well. So it was really lovely to get them to sit up high up in the mountains and look down on this valley and I'll send you a photo of it and then say okay, what does this world here need to be well? So think about five areas food healthy food systems, and of course, most of our food systems are not healthy at all. They're very industrial and use. food, water, healthy water systems and and water waste transport and clean energy.

I: So when you talk about nature-based principles of harmony, in your curriculums, are those the five things that you are kind of considering as well?

R: Good question, I would say the outcomes of this learning feed into those areas we've just discussed, those five areas. The principles of harmony are principles of nature. They are eternal, universal principles of like they are everywhere, and they have always been that so what we are saying with harmony, which is different from justice sustainability education program. And I see this all the time, is that those programs are just fixing the problems. So they're saying, all right, we've got loads of weight, like I'll beaches covered in plastic bottles and rubbish, how we going to fix that? That's fine, like you might do litipic. We're saying before we get to that point and all of our projects will have a sustainability action like that, we're saying before we get there, let's start to learn year on year repeatedly let's learn the principles of harmony, the principles of nature, which enable any system to be sustainable. So those principles are slightly different, so I'll give you, well, I'll tell you them very quickly. You may be aware of them. The first one is cycles, so nature is cyclical, and if a system is cyclical, it's sustainable. It never stops, keeps going. So we have to create circular systems, circular economies, the future, your future, and children's future has to be circular. So if they understand that that

sustainable systems work in cycles, which is what nature does every day, every season and year through plant life cycles through animal life cycles, through solar system cycles. They understand that life is cyclical. So year on year, we would give children a project of learning around the idea of a cycle. And as they get older, they go, oh, right, we've done a cycle project last year and like this and now we're doing one like this, and now I'm really starting to understand the value of cycles. We also look at diversity. So we say we're all different and that's good. So we're little ones. We would say it's good to be different. So we want them to value each other for a difference. We're same, the same in certain respects, but actually it's really lovely that we're all different. And wouldn't it be boring if we were all the same? then we can say, but also the natural world of which we are part, it's amazingly diverse. We call it biodiversity. So let's go and learn about how many different wildflowers there are, how many different butterflies there are, how many different trees in Wales there are how many different whatever it is, fish in the seas. So we can look at different species and and diversity within species. So the diversity message then tells them as you grow up, always value and celebrate diversity. That's a really good message so a third principle is interdependence, becoming a systems thinker, so seeing that everything like we were saying earlier with learning is interconnected Everything we say like this, we say everything is connected. to children then see that, unlike us are actually quite ridiculous education system that silos everything, we should join everything up and then we see how it works together. So that's a really lovely message so they learn about systems, ecosystems, community of systems, people, and they see that if we're going to be sustainable we have to work with sustainable systems, systems that work in harmony we would say. The fourth one is adaptation. So nature is adapted to its place. What you see in a desert or in a mountain

environment would be different from what you might see in aalley in Wales. So and all the species in that system are adapted and have involved and adapted to work in that place. So how do we adapt in our village in our town to make sure that our systems also work and if they're not working, what are we going to change? So adaptation is about change for the better. The fifth one is health, so what makes the system healthy? What makes me healthy? Like you said earlier, the inquiry on health? So I need quite a lot of things. We all need quite a lot of things to make us healthy. It's about our food, it's about exercise, it's about play and having time to play and enjoy our lives, whatever it is, that's all health. But then we can look at health in nature. Why are our rivers sick? Why are our oceans sick? Why is our lands sick? and so on and what can make it healthy? And the last one is very simply what we call oneness. So we say that we're all part of something greater. Now, you can give that so our view would be it doesn't matter what context it is. It might be a religious context an indigenous culture context a you know, community we're all part of something greater. With little ones, we would say you're in a class, your class is in a school, your school is in a community, your community is a country, our countries in a world and they're all circles. The oneness principle. So we want them to see that great traditions like Egyptians and Greeks and others, they always understood we were part of something greater, like this cosmos, this universe. um So, yeah, so that's quite an interesting one to explain with them. But every half term if they do one project linked to those, and then we draw out the sustainability areas like food and waste and energy. Then they basically a philosophy for life to help them to live is a sustainable way.

I: Have you found that you've had any sort of like friction from I mean, I completely agree with like I obviously studied harmony. I I like agree with the philosophy behind it, but I

just think that sometimes if if you say harmony, like I have noticed it since telling people that I'm studying harmony, it's like oh, that's very radical. and like people might not have a clear idea of what it is until you further explain, and obviously you're doing a whole project which is bringing it into curriculum. So is there been any sort of like, um criticism about, like invoking like epistemologies on children or like trying to force a worldview?

R: Not really? I say not really. I mean, you're right. People sometimes say, well, you know, what's that? So we tend to go through the lens of sustainability because people get sustainability, although I would argue that people often don't know quite what sustainability means. So, you know, you can turn the lights off and then you can live in a way that is burning a whole load of energy in other ways so it definitely needs some thinking through, but no, I I think so when people understand it, you know, no one has ever said to me what you're saying is not true or radical. I'm just explaining the principles of life. That's it. We are in the principles of life. So if you do it through that lens, I think people get there.

I: Yeah, it's just interesting because in my in the research I've I've kind of like looked into that because obviously like it's similar to like indigenous wisdoms and like the kind of resistance that that can that can get. So I've said that the approach is from, like you've just said, a sustainability lens, but being informed by harmony it to kind of like um almost like mitigate any potential friction that it might cause, but it's just interesting to know that you haven't had any.

R: I think interestingly, the only area where I think it's challenging is we might say we do say we are nature. In fact, it's a really good question to ask children. Are we nature? And our view would be one of the problems we face is that there's this disconnect from

nature and we who somehow see that we're separate from it. But we are nature, but not just a part of it, we are in nature. So, you know, our whole being has come from the earth, You know, we we are what we eat and and drink and so it's all come from nature and we will go back to that so the challenge then I think interestingly is around things like religion because a religious, if you take a church of church of Wales perspective, they might say uh or they don't agree with that. It's called a pantheistic view Pantheism is seeing us as part of nature so that could be a change. I've seen that's probably the only time that I've seen a potential fiction, but I would be very kind of open like that I'd say you know, we might say we are nature, you might say we are we are part of, you know, with reference to God. And to be honest, I don't really mind if people want to say it through that length, that's up to you fine. And and of course, other world religions like Buddhism, very nature connected, Islam interesting, is very nature connected. I mean, I'm working with the of Bristol prison and they do a lot of nature-based learning around our work. So I've just been in Bristol prison this week only for a couple of hours and must that um you know, it's really really interesting.

I: Yeah, it sounds really interesting you're doing like amazing stuff.

R: Well, I think just trying to help people as you said at the beginning, you know, we've got a bit of a crisis on our hands. We know that there are lots of things wrong and actually harmony just means getting on together as people and working in ways that get along with the natural world too. And they' it's I mean, it it's uh maybe a slightly grander word than health, but it means the same thing. You know, when things are in harmony, they are healthy. let me just end with that quote, when a system is in harmony, it is

healthy, when a system is healthy, it is sustainable. So if we want to create a sustainable future, we need to learn the principles of harmony.

I: is that is that you?

R: That's' me

I: I really love that. So, yeah. Well, thank you so much for talking to me and like thank you for all of your insights and stuff. It's really been interesting..

R: It's really lovely to meet you and let me know if you need anything else. um and I mean, I can link you to [redacted], but just, yeah, see, I mean, if it's something you want to do at some point, let me know., you just uh connect you at some whenever's ready.