NIHR | School for Public Health Research

Exploring the effectiveness of ‘Forest School’ on the health and development of pre-school aged children

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INTRODUCTION

HISTORICAL BACKGROUND OF FOREST SCHOOL

Despite the development of Forest School as a specific pedagogy being a relatively recent phenomenon, the movement is grounded in a rich history of outdoor and child-centred learning (FSA, n.d.).

Going back to the Victorian era, the United Kingdom (UK) has a rich heritage in taking children outdoors and engaging with nature (Cree & McCree, 2012). This heritage is inextricably linked to the Romantic movement, coined by a group of English intellectuals such as Wordsworth and Ruskin, in rebellion against Enlightenment rationalism and the industrial revolution (ibid). Romanticism exalted the sublimeness of nature, creative freedom and imagination which led to a construction of childhood as innocent and natural (Kehily & Montgomergy, 2009). Furthermore, romanticism was rooted in the same German Sturm and Drang movement from which the child-centred educators of the time: Pestalozzi, Froebel, and Steiner, emerged (Cree & McCree, 2012). These educators advocated the importance of childhood connection to nature, a key characteristic of Forest School today (Cudworth & Lumber, 2021).

Similarly in the United States, the American transcendentalists, such as John Muir, sought to challenge the trajectory of industrial capitalism through elucidating the importance of a ‘spiritual connection’ with the natural world (Brinkley, 2010).

The late 1800s and early 1900s, saw increasing attempts to connect children with nature such as Baden-Powell’s (1908) scouting movement. A number of educationalists such as Margaret McMillan, Maria Montessori, Susan Isaacs, and Kurt Hahn developed educational philosophies and practices which would pave the way to the progressive, child-centred foundations of Forest School pedagogy (Bradshaw, 2018).

However, Forest School as a specific practice has its roots in Scandinavia where children often spend their whole time at kindergarten outdoors (Turtle et al., 2015). The Forest School concept developed in Scandinavia around the 1950s such as through the development of the Skogsmulle school in Sweden and Metsamoori in Finland (Cree and McCree, 2012).

Forest School in Scandinavia differs from the traditional Hahnian roots of outdoor education and is instead informed by the Scandinavian philosophy of 'Friluftsliv' (Leather, 2018). 'Friluftsliv' translates as 'free air life' and refers to a lifestyle philosophy built on freedom in nature and a spiritual connection with landscape (Gelter, 2000). This philosophy permeates early years education in Scandinavia with emphasis placed on experiential learning and interaction with the outdoors (FSA, n.d.). Experiential learning, emerging from the work of John Dewey (1938), is a nuanced, educational phenomena that focusses on education through experience and personal discovery.

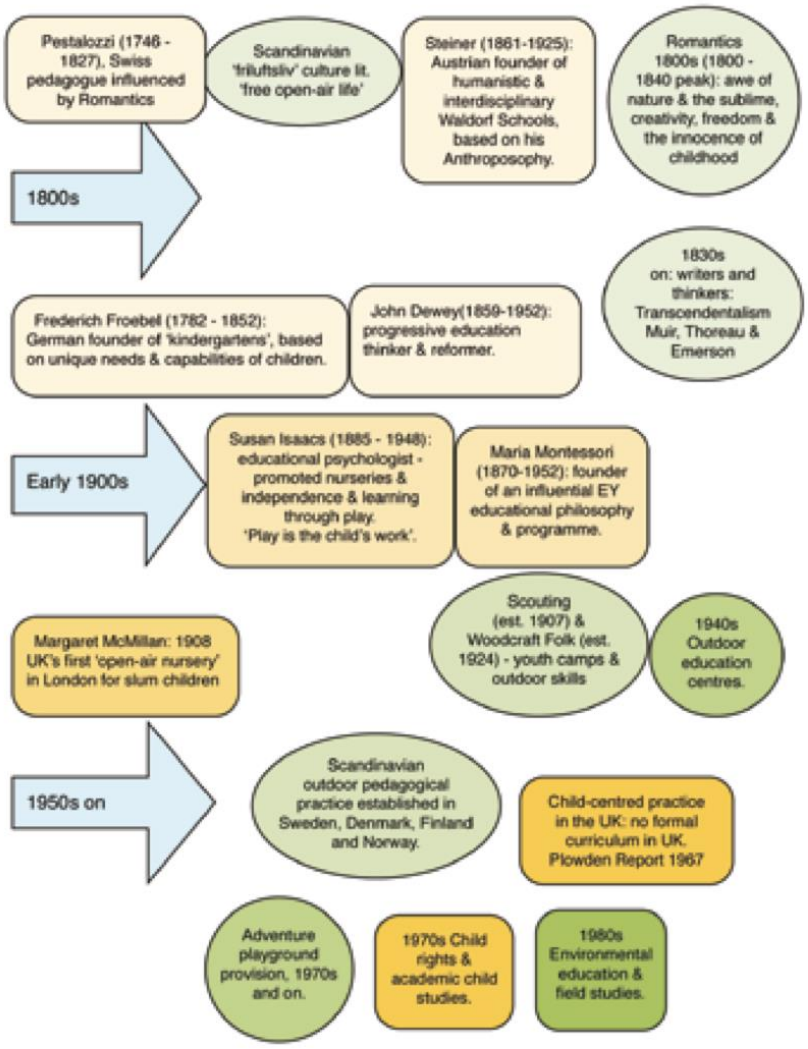

Figure 1: Historical antecedents of Forest Schools. Retrieved from Cree & McCree (2012).

The concept of Forest School was pioneered in the UK in 1993 when a group of Early Years Professionals from Bridgwater College, Somerset went on an exchange visit to Denmark (Murphy, 2020). They were inspired by the 'Friluftsliv' philosophy present in the pre-school education system and so developed their own form of Forest School back in the UK (Turtle et al., 2015).

Influenced by the Forest School training at Bridgwater College, various initiatives around the UK developed to deliver a form of Forest School (O'Brien and Murray, 2005). These included Forest Schools which were: privately ran, supported by Local Education Authorities and those which came about through the development of the Forest Education Initiative (FEI) (ibid).

The Forest Education Initiative (FEI) was set up in 1992 as a partnership between the Forestry Commission, Woodland Trust, Tree Council, British Trust for Conservation Volunteers, Groundwork, ConFor, Timber Trade Federation, Community Forests and Field Studies Council (O'Brien and Murray, 2005). The Forestry Commission was the main driver and funder of the FEI as it aimed to network and support Forest School clusters across the UK (Forest Research, n.d.).

Through the work of the FEI, the Forest School Network was established in the early 2000s (FSA, n.d.). The rapid development of Forest School as a grassroots movement was backed up by evaluative research into the effectiveness of Forest School – with a lot of the research being produced by the Forestry Commission (Cree and McCree, 2012). In 2002, the Forest School Network agreed upon a definition of Forest Schools and the principles and criteria that they should follow (O'Brien and Murray, 2005). Then, in 2008, the Forest School Special Interest Group (FSSIG) was set up within the Institute for Outdoor Learning (IOL), which played a key role in the establishment of the Forest School Association (FSA) in 2012 (Cree and McCree, 2012).

Today, there is still no centralised organisation for Forest School despite the practice being ubiquitous across the UK. The Forest School Association (FSA) remains one of the largest networks of Forest School practice but there are many others such as Archimedes Earth and the Outdoor and Sustainability Education Specialists (OASES) (Berrington, 2012).

Forest School in the UK is used predominantly in early years settings where contact with nature is seen as an "integral and vital component of education" (Turtle et al., 2015, p.2). In the UK, 'early years' normally refers to the 'Early Years Foundation Stage' of 0 to 5 years coinciding with children up to reception class (LOtC, n.d.). This definition of 'early years'

varies internationally. For example, in Scandinavia Forest Schools are a key part of 'kindergarten' where children attend up to age 7 before starting formal education (Cree and McCree, 2012).

Despite this, in the UK, there are many other groups for whom Forest School has been recognised as a beneficial practice such as those with Special Educational Needs and behavioural difficulties (Knight, 2009).

FOREST SCHOOL PEDAGOGY

Defining forest school

There are intranational and inter-organisational differences in the way that Forest School is defined and practiced. However, in the UK, Forest School pedagogy must meet the criteria of the training organisation which in general hold a similar definition and requirements of Forest School as the Forest School Association (FSA).

The FSA define Forest School as:

'An inspirational process, that offers ALL learners regular opportunities to achieve and develop confidence and self-esteem through hands-on learning experiences in a woodland or natural environment with trees' (Forest School Association, n.d.).

The 6 criteria of quality Forest School as defined by the FSA are as follows:

1. Forest School is a long-term process of regular sessions, rather than one-off or infrequent visits; the cycle of planning, observation, adaptation, and review links each session.
2. Forest School takes place in a woodland or natural environment to support the development of a lifelong relationship between the learner and the natural world.
3. Forest School uses a range of learner-centred processes to create a community for being, development and learning.
4. Forest School aims to promote the holistic development of all involved, fostering resilient, confident, independent, and creative learners.
5. Forest School offers learners the opportunity to take supported risks appropriate to the environment and to themselves.

6. Forest School is run by qualified Forest School practitioners, who continuously maintain and develop their professional practice.

(Forest School Association, n.d.)

It is these criteria which make Forest School different from other forms of Outdoor Education (O'Brien & Murray, 2005).

FOREST SCHOOLS AS A PUBLIC HEALTH INTERVENTION

The purpose of this literature review is to examine the effectiveness of Forest School on the health and development of pre-school aged children. If research shows Forest School to be effective, it provides evidence of their potential as a public health intervention.

For funding bodies like the 'Education Endowment Fund' to provide finances for such interventions, evidence of impact must be provided (EEF, n.d.). Hence such research is highly necessary, especially given the importance of such public health interventions in the context of the poor state of wellbeing and health of many children in the UK (UNICEF, 2007). As Sarah Knight (2016, p. 2) argues: "my concern is with the UK, where the strains of modern life are having deleterious effects on the health and well-being of many people. Forest School for all is not the only answer but it does offer benefits that all can access, which does increase its value." The benefit of Forest School is that it may offer a creative and innovative approach to solving inequalities in public health which pays attention to the need for interventions to be fun, engaging, and embodied (Kurtz, 2021).

CURRENT SOCIO-CULTURAL AND POLITICAL CLIMATE

In his seminal work 'Last Child in the Woods', Richard Louv (2008) introduces his concept of 'Nature Deficit Disorder'. This is developed from the work of the Harvard entomologist Edward O. Wilson who suggested that humans have an intrinsic need to be affiliated with the natural world (Kenny, 2010). Louv (2008) postulates that nature is so much part of our social context that a lack of connection to nature causes symptoms of 'nature-deficit disorder'.

Louv (2008) particularly highlights the issues of 'nature-deficit disorder' for children, arguing that a reduction in outdoor play can have negative impacts on children's wellbeing, health, and development. For Knight (2009a), there is a current crisis in the UK as children's lack of engagement with nature has contributed somewhat to issues of childhood obesity, poor social and emotional skills, and behavioural problems (Moss, 2012; Natural England, 2009).

Various socio-political factors have contributed to this reduction in engagement with the outdoors. Many children growing up in the UK until around the 1980s had huge freedom to play outdoors, often unaccompanied by adults (Gill, 2007). However, this has massively shifted after the last few decades with far less children spending time outside (Dodd et al., 2021). Since the 1970s the area that children roam without supervision has decreased by almost 90% (Monbiot, 2012). Clements (2004) argues that shift can be attributed to socio-cultural and economic changes such as changes to transport systems and recreational activities.

Another large socio-cultural factor for this decline in engagement with the outdoors is risk and perception of risk (Maynard, 2007b). Risk-consciousness has become all-pervasive and has led to a fear of letting children play in the outdoors and be unaccompanied (Gill, 2010). Although this perception of risk is founded on genuine concern and has reason not to be disregarded, there are ways and methods of balancing risk with reward (ibid). Some element of risk-taking is needed for children to understand safety and manage risks (Moss, 2012). Risk-taking also has health and developmental benefits, such as developing resilience, as well as having a positive impact on the growth of children's personality and character (Gill, 2007).

Much of the development of Forest School has come about in the context of these shifting dynamics. Forest School offers a way of managing risks to children, whilst also offering them the benefits of risk taking in an exciting and expansive environment (Morgan, 2018).

Another aspect of the UK's social and political climate that has led to decline in children's engagement with the outdoors is the hegemonic neoliberal agenda (Cudworth and Lumber, 2021). Mainstream learning environments have been conformed to specific spatial practices, embedded within the power relations of performativity culture and neoliberal policy (Cudworth, 2018; Ball, 2017). For the UK, the commodification and marketisation of education has led to a primacy of grades and testing (Leather, 2018). This, and the need for a standardisation across schools with the development of the National Curriculum in 1988 (Education Reform Act of 1988), has led to a decrease in value placed on outdoor education (Leather, 2018).

However, recognising the benefits of outdoor learning, schools have been encouraged to integrate elements of outdoor learning into the curriculum (DfES, 2006). This is especially the case for the Early Years Foundation Stage curriculum, covering children from birth to the end of reception year which places huge value on daily outdoor experiences for

children's learning and development (LOtC, n.d.). Forest School is one way in which schools have sought to re-address their provision of curriculum-based outdoor learning for children especially those in the pre-school age group (Cudworth & Lumber, 2021).

AIMS OF THE PROJECT

This project aimed to:

1. Discover what is known from the existing literature about the effectiveness of Forest School on a range of health and developmental indicators, including: physical activity, physical, cognitive, and social and emotional development, and wellbeing.

2. Identify characteristics (e.g., socioeconomic status, ethnicity) of the children who access the programme.

The literature review is supplemented by discussions with stakeholders and practitioners who lead and engage with the Forest School programme in the community.

THE EFFECTIVENESS OF FOREST SCHOOLS

METHOD

For the purposes of this study all literature outside of the UK has been excluded unless used to provide context. This is because Forest School in the UK is a specific pedagogy aligning with the FSA's definition of Forest School (Forest School Association, n.d.). Forest School on the international level takes many different forms such as the Australian 'bush school' (Cumming & Nash, 2015), Turkish Forest School (more similar to the Scandinavian method) (Dilek & Atasoy, 2020) and Forest School in North America (Bradshaw, 2018; Boileau & Dabaja, 2020; Kiewra & Veselack, 2016).

Furthermore, recent years have seen the development of new pedagogies similar to that of Forest School in the UK such as 'Beach Schools' (OASES, n.d.). Studies on these pedagogies have also been excluded for the purposes of keeping the literature review specific to Forest School.

Although some of the articles researched focused on a specific health and developmental indicators, many of them took a more holistic approach considering a variety of benefits of Forest School. Much of the rationale for this is due to the difficulty of compartmentalising health and developmental indicators. There is great interconnectivity between the different

benefits of Forest School. For example, whilst Coates and Pimlott-Wilson (2019) article can largely be categorised as focussing on the benefits of Forest School for learning, the article demonstrates the linkages that can be between learning and wellbeing, as well as the physical benefits of learning through play. Hence, for the sake of structure, the literature review groups the studies into holistic approaches, learning and cognition, wellbeing and connection to nature, physical activity, and emotional and social development (see Figure 2). However, the interconnectivity and interlinkages between these categories must be acknowledged. A full table of the health and developmental indicators discussed can be seen in Appendix 1 and 2.

Finally, only eleven studies in the literature discussed the effectiveness of Forest School for pre-school children (ages 3-5), despite this age group being the largest to access the intervention (Knight, 2016). This is the context of around thirty studies which consider the effectiveness of Forest School. Furthermore, only four studies in total focus specifically on the early years elucidating a clear area for future research. Hence, for the sake of this literature review, the eleven studies which consider pre-school children in their sample or were longitudinal in nature, with children starting out at pre-school age, will be discussed. However, in some places, other studies are drawn upon to provide context and background or to highlight areas for future research. It is also important to note, that due to the lack of research on Forest School, many of the research projects drawn upon vary from evaluative reports produced by Forest School practitioners to projects found in peer-reviewed academic journals.

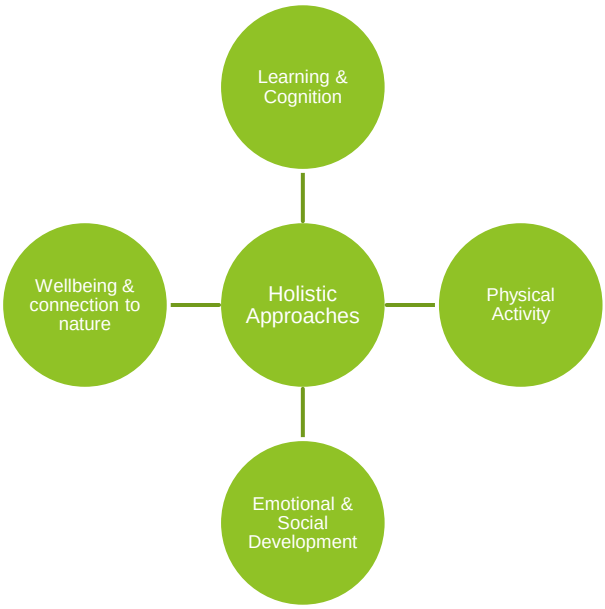

Figure 2: Health and developmental indicators explored in the included studies'

HOLISTIC APPROACHES

Many of the studies investigating the effectiveness of Forest School on different health and developmental indicators take a holistic approach to their enquiry. This is where instead of focusing specifically on one particular health or developmental indicator, they consider a plethora of Forest School benefits. The advantage of this approach is that it acknowledges the interconnectivity of different health and development benefits, seeing different benefits not in isolation but as intrinsically dependent on a wide range of factors.

Early Years

One such study was conducted by Massey (2005), which took the form of a longitudinal, participatory case study and aimed to examine the benefits of Forest School on pre-school children. The study's sample included eight children aged 3 – 4 years old in Worcestershire and spanned the course of an academic year. The case study used a mixed-methods approach, using a combination of questionnaires, informal interviews, anecdotal logs, camcorder recorded observations, involvement time observations and photographs.

Massey (2005) draws attention to a range of health and developmental indicators that could be identified in the data. The children appeared to develop both personally and socially through the development of confidence, independence, and self-esteem. They also developed in their friendships and relationships, for example the children started to ask other children for help in activities (Massey, 2005, p. 4). Furthermore, the children refined skills in language and communication particularly with regards to finding a context that utilised their language development. Finally, the children benefited from the advancement of learning and cognitive skills such as problem solving and decision making. For example, Massey (2005) describes how from the enjoyment of splashing in puddles the children began to ask questions of where puddles came from and why they disappear. Massey (2005) argues that these skills developed through the provision of an environment in which the children could take risks and make mistakes. This acknowledges that so much learning happens when children are taken beyond their 'comfort zone' (Gill, 2010).

It is this idea that Attwood (2010, p. 21) builds upon, arguing that Forest School tested children's: "self-reliance and personal resilience through pushing them into unfamiliar territory with new structures and new possibilities." Attwood (2010) also investigated the benefits of Forest School on a pre-school age sample (aged 3-4 years), although Attwood's study is much shorter in length considering benefits over a six-week period in Twerton, Bath. The methodology included: observations, a strengths and difficulties questionnaire (SDQ)

and a Leuven involvement scale (LIS). The data produced was then analysed both qualitatively and qualitatively through thematic analysis and statistical testing.

Results from the SDQ demonstrated that, although the tool is useful for exploring specific behaviours in certain children, the tool was not sensitive enough to explore any significant behavioural change in the majority of the children. Two of the boys involved in the project did show a positive reduction in behavioural difficulties in the SDQ, but this would need to be compared to a control group of children undertaking regular nursery sessions to see if Forest School was the reason for the change. Similarly, to the SDQ, data from the LIS was not incorporated into the overall findings made from the project since the results from the Leuven scale were 'somewhat erratic' (Attwood, 2010, p. 14). This is because there was inconsistency in the recorded information and a lack of experience in how to take the scores; for example, in some cases not enough readings were taken.

However, observations of the children showed that the most significant changes were in levels of self-esteem and confidence; the development of physical skills and the demonstration of an improved relationship with and understanding of the outdoors. Some changes were also observed in levels of creativity and imagination; levels of motivation and concentration and the development of language and communication skills. The least change was seen in the ability to work co-operatively and gain an awareness of others, which is interesting given the findings of Massey (2005), which showed this to be one of the most significant areas of development. Attwood (2010) concludes that Forest School is indeed a beneficial intervention for pre-school children, although the children involved benefitted to varying degrees. Attwood (2010) also highlights, although only anecdotally, that some of the experiences in Forest School had longer term significance, with benefits only becoming apparent after the conclusion of the project.

Children and Young People

Many of the studies that explore the effectiveness of Forest School consider both pre-school aged children and older children in their sample. These studies have been included given the low propensity of studies which focus specifically on the early years.

For example, one of the seminal research projects on Forest School was conducted by Murray and O'Brien (2005) and funded by the Forestry Commission. The study included two phases. The first phase was undertaken in Wales and utilised a participatory approach to develop a 'theory of change' about how Forest School has an impact on the children involved. This phase drew together Forest School leaders, teachers, and community

representatives in two case study areas in north and south Wales to develop six propositions that practitioners believed were important changes for the Forest School programmes to be deemed as effective. These propositions were:

- Increases the self-esteem and self-confidence of individuals who take part
- Improves an individual's ability to work co-operatively and increases their awareness of others
- Counters a lack of motivation and negative attitude towards learning
- Encourages ownership and pride in the local environment
- Encourages an improved relationship with, and better understanding of, the outdoors
- Increases the skills and knowledge of the individuals who take part

The second phase of the research aimed to explore whether these changes could be observed in a different Forest School setting. This followed three case study settings: two Early Years groups in Oxfordshire and Worcestershire and a Forest School in Somerset which focused on teenagers with emotional and behavioural difficulties. In total, 24 children's progress was tracked over a period of eight months. Again, the study used a mixed-methods approach utilising methodologies including a storyboard exercise, onsite data collection and analysis, reflection posters by practitioners and additional feedback from parents and teachers in the form of questionnaires and interviews. All three case study locations undertook the initial stage of the evaluation (the storyboard exercise) but time-constraints meant that the group from Somerset did not continue as part of the project. Due to this, an additional early years group from Shropshire joined the research project to undertake the subsequent evaluation methodologies.

Findings from the second phase showed that change could be observed in all the areas proposed in phase one. These changes are specifically grouped into eight themes which emerged from the data: confidence, social skills, language and communication, motivation and concentration, physical skills, knowledge and understanding, new perspectives and ripple effects beyond Forest School. The changes reported were from the early years groups, since the adolescents from Somerset were not present later in the study. Murray and O'Brien (2005) conclude that some of the children displayed significant and surprising changes in behaviour which can be wholly or at least partly attributable to their involvement in Forest School. A limitation of the study is that Murray and O'Brien (2005) do not comment

on which particular changes were the most significant and surprising. Furthermore, for the observed changes it is difficult to assess whether change occurred because of the Forest School intervention or through natural development. This is the issue of the counterfactual, whereby in naturalistic research it is not possible to determine what the outcome would be had the intervention not taken place. Although control groups can be used to provide comparison, since all 'natural development' happens in context and is influenced by a multiplicity of variables, it cannot be determined whether Forest School is the cause of any changes. But, overall, Murray and O'Brien (2005) argue that Forest School is a highly effective intervention that allows children to express themselves physically and verbally and develop a wide range of skills and competencies.

From the themes that emerged from Murray and O'Brien's (2005) research, Berrington (2012) interviewed eight Forest School practioners in Bradford asking for evidence of the themes. The interviewer asked practitioners to qualify how they knew Forest School had made an impact and what aspects of Forest school had caused the changes. Berrington (2012) acknowledges the limitations of the anecdotal nature of the evidence in this study but concludes that evidence of impact could be seen in all eight themes. Berrington (2012) proposes that although the advantage of the study was that it covered several different Forest Schools, none of the Forest School offered interventions of a considerable time period. Therefore, there is a need for larger-scale, longitudinal studies, even if such research designs are costly to run.

Another study examining both a pre-school age sample alongside older children is a 2019 study by Coates and Pimlott-Wilson. This study investigated the effectiveness of Forest School for two schools in the East Midlands: one which provided Forest School to Year 4 pupils (8–9-year-olds) and the other to the Foundation Year (4–5-year-olds). The study is positioned within the ontological paradigm of social constructivism, and engages with an exploratory, phenomenological research design. Semi-structured interviews were conducted with 33 children, across both groups, who had recently completed a six-week Forest School programme. Head-teachers and Forest School practitioners were also interviewed. The children were also asked to engage with participatory activities including a word-association task and drawing task for the younger children. Photographs were also taken of the school and Forest School. The data was then analysed through rigorous qualitative, thematic analysis from which emerged themes of a break from routine, learning through play and collaboration and teamwork.

From these themes, Coates and Pimlott-Wilson (2019) conclude that Forest School should be used in conjunction with mainstream school settings as Forest School contributes to the social, cognitive, emotional, and physical development of children. They argue this is through a learning-through play, experiential pedagogy. As previously described experiential learning is the process by which children learn through self-discovery (Dewey, 1938). For Coates and Pimlott-Wilson (2019) Forest School equips children with skills and capacities needed for learning, such as the development of creativity and problem-solving. It also breaks down the boundaries and conventions of traditional schooling, encouraging children to enjoy and reflect on their own learning. This enactment of play-pedagogy hence instils in children a natural curiosity and desire to learn, central to what Claxton (2010) describes as 'building learning power'. Furthermore, Coates and Pimlott-Wilson (2019) describe how Forest School expands children's learning beyond the academic such as through the development of physical literacy, the forging of stronger social support networks and the provision of core social skills such as conflict management and negotiation.

LEARNING AND COGNITION

Early Years

In his (2006) TED talk, Sir Ken Robinson argued that: 'We don't grow into creativity, we grow out of it. Or rather, we get educated out of it'. Robinson (2001) postulates the inextricability of creativity and learning, especially in the contemporary world which needs innovative and adaptable thinkers. However, he argues that many schools stifle creative capacity in students (Robinson, 2006).

In their research, Kenny (2010) draws on Robinson (2001) arguing that Forest School is one pedagogy which can support such dispositions of creativity and 'generative thinking' that are needed for the post-industrial workforce.

Kenny's (2010) research takes the form of an interpretive, ethnographic case study. The rationale behind this was to remain congruent with the child-centred principles of Forest School, leading the researcher to choose an interpretive framework. This framework sought to use a smaller sample size to understand deeply the phenomena of Forest School, rather than making generalisations which would suggest Forest School curriculum to be: "ordered, predetermined, uniform, predictable and largely behaviourist in outcome" (Cohen, 2000: 32). This allows the experience of being part of Forest School to be researched, rather than simply focussing on outcomes and impacts, hence highlighting the importance of

interpretivist studies in this field of research. The research investigated the experience of Forest School of 10 reception class children (5 girls and 5 boys) in Bath over five weeks.

The study aimed to explore if Forest School could contribute to the learning, wellbeing, and development of the young children. It also considered whether Forest School could meet the requirements of key statutory frameworks of the EYFS (Early Years Foundation Stage), hence why this study has been grouped under learning and cognition. The research used a mixed-methods approach, attempting robust triangulation through the use of:

- Leuven Involvement and Wellbeing Scales
- Strengths and Difficulties Questionnaire (SDQ)
- Observations
- Review comments
- EYFS Scale Point Data

Kenny's (2010) study concluded that there was compelling evidence of the impact of Forest School for reception aged children. A significant difference between normal school and Forest School based learning was shown in the data for the involvement and wellbeing scales demonstrating that Forest School effectively produced an optimal environment in which the children could learn. This was especially the case for several of the children who had recorded low levels of academic achievement, who had very high levels of involvement and wellbeing in Forest School. This suggests that Forest School, if used over a longer period of time, has potential to contribute to the closing of the attainment gap between pupils.

A similar link is made between learning and wellbeing in a study by Barrable and Arvanitis (2019). This research was anecdotal in nature, considering Forest School literature through the lens of self-determination theory (SDT). Considering Forest School mainly as an intervention for younger children, the researcher's draw on Ryan and Deci's (2017) conceptualisation of SDT to understand how Forest School provides an optimal environment for learning. SDT understands humans to be active, growth-orientated organisms who develop intrinsic motivation for learning when the core psychological needs of autonomy, competence and relatedness are met (Deci & Ryan, 2000).

Barrable and Arvanitis (2019) conclude that Forest School pedagogy utilises these optimal conditions for learning, helping learners to be excited and engaged. They consider Forest School as a 'specialised learning approach', linked with 'constructivist' pedagogy. This is a 'meaning making theory', which sees learners as co-constructers of knowledge, rather than

receivers (Richardson, 2003). Children, in this case, learn through their interactions with other people and their environment. Forest School draws on this educational philosophy, originating in the 'experiential learning' philosophy of John Dewey (Ord and Leather, 2011) along with Frobel and Steiner. Hence, through the lens of self-determination theory and experiential learning, Forest School can be viewed as an effective pedagogy for the development of learning and cognition in pre-school children.

Children and Young People

Research by Harris (2018) conceptualises the characteristics of Forest School as an 'outdoor learning space,' exploring how the learning space of Forest School shapes the experience of learners and Forest School leaders as they engage in learning outside the classroom.

The research takes a qualitative, theory-building approach, starting with observations of children attending Forest School and then a series of semi-structured interviews with Forest School practitioners. 20 interviews were untaken on the phone with Forest School leaders (13 female and 7 male) from five different Forest School cluster groups. The advantage of this study is that a range of different Forest School models are included in the findings, along with the sample spanning varying spatial locations from urban to rural. All the Forest School leaders had been practising for a minimum of three years and had focused mainly on teaching Forest School to primary aged children (4-11).

Harris (2018) found that the outdoor space provided new opportunities for the children to interact and learn. Similarly, to the findings of Barrable and Arvanitis (2019, Harris (2018) found that Forest School provided a space in which learners and educators could co-create knowledge. The concept of 'freedom' emerged from thematic analysis of the interview data, through the way that the metaphorical space of the outdoor learning environment challenged the dichotomy between teacher and learner. In contrast to the materiality of the classroom and its associated constraints of behavioural expectations, time pressures and demands of the national curriculum, the Forest School learning environment provided a more flexible and responsive learning environment.

Bradshaw (2018) argues that the freedom provided by Forest School is the condition which allows children to take risks, providing them with agency for their own learning and hence take responsibility for their educational experience. Thus, Forest School pedagogy has the potential to provide a nourishing and exciting learning climate in which children can develop

the dispositions for learning needed to be a 'life-long learner'. This is exactly the learning climate which Claxton (2010) suggests as capable of 'building learning power'.

WELLBEING AND CONNECTION TO NATURE

Wellbeing is an inherently contested term, consisting of a 'complex terminology landscape' (Hartwell, 2013, p. 230). The notion of wellbeing has historical routes, such as Aristotle's idea of 'eudaimonia' or 'human flourishing' (MacKian, 2009). However, it is of growing interest in the contemporary climate, especially within research (Hartwell, 2013). The table shown in Figure 3 demonstrates a comprehensive overview of the meaning of wellbeing in the post-modern era.

From this we can understand wellbeing as a concept composed of a myriad of elements, elucidating the interconnectivity of the concept to all the aspects of the benefits of Forest School. Wellbeing can be considered intrinsic to the learning process, as researched by Kenny (2010), as well as being critical to physical health and emotional and social development.

However, a key theme emerging from the Forest School literature is the inextricability of wellbeing and connection to nature, as highlighted by Louv's (2008) 'Nature-Deficit-Disorder.' This suggests that Forests, or indeed other outdoor spaces, have an ability to promote wellbeing. Forests, hence, may be described as a 'therapeutic landscape' to use Gesler's (2003; 2005) term. For Gesler (2003), the natural environment has a 'healing' quality that allows it to contribute to not only physical health but also mental, emotional, and spiritual health.

Furthermore, a key area of concern that arose from the literature was a need for children to connect to nature in the context of climate change, with some articles highlighting how children today have far less contact with the outdoors and therefore feel less of an imperative to conserve the environment. This idea is also present in the literature such as Turtle, Convery and Convery's (2015) study which showed how Forest School was effective at developing a 'pro-environmental' attitude in children. They found that there was a statistically significant difference in environmental attitude between children who had participated in Forest School and those who had not. Therefore, interventions, like Forest School, are not only important for the wellbeing of our children but for the wellbeing of the planet.

The link between environmental connection and wellbeing is something that has been explored relatively recently in Forest School literature. This is interesting given the growing

interest in wellbeing in a context of a nation-wide mental health crisis in the wake of Covid-19. Here, Forest School is explored as an intervention for mental and emotional health, given the 'healing' nature of the forest environment.

Table 1 Elemental table of well-being

Element	*Key attributes*	*Explanation*
Physical	Health, illness, fitness, disability	Although health is only one possible, and not necessary, condition of well-being, the body nonetheless represents a key site for the enactment, performance, and securing of well-being. Hence, e.g., the notion of designing 'therapeutic landscapes' to enhance well-being and hasten recovery from ill-health and surgery. Nonetheless it is undoubtedly possible to experience a sense of well-being during periods of acute illness. People in the situation of long-term illness often end up with a profound sense of well-being on many levels because they have more to come to terms with and have been forced to develop ways of being which most people have never had to contemplate. Thus a subjectively assessed sense of well-being can transcend physiological state. This is also being acknowledged in studies of health and place which are seeking increasingly to move notions of 'health' beyond medicalized constructions.
Social	Relationships at personal, community, and society level	Social connectedness can lead to both individual well-being and community or social well-being. This aspect is reflected in an increasing interest in interconnectedness, interdependence, and notions of 'social capital' which have pushed social well-being center-stage. Here the argument is that weakening of social relations has led to a degradation of social networks and the benefits they accrue. This discourse has also infiltrated educational agendas with national governments, local authorities, and individual schools and workplaces recognizing and acting upon the significance of well-being to the smooth running of institutions, communities, and families.
Economic	Consumption, wealth, material advancement, career, work	Economic comfort and good health do not automatically equate with a sense of well-being. Conversely, some who experience what has been identified as a quantifiably poor quality of life may still feel a sense of well-being. The idea of economic well-being can be tied to the national economy, or focus in upon the individual self, particularly in the context of the workplace. Increasingly in a Western context the workplace is being seen as a place where the individual should not have his/her well-being undermined-both for the employees' dignity and for the economic success of the employer. Indeed measures to promote well-being in the workplace, from Tai Chi classes to the creation of therapeutic outdoor spaces, have been adopted as one strategy toward increased productivity in the workplace.
Political	Democracy, dignity, choice, influence	The right to dignity, choice, and an opportunity to make change is a central part of well-being. The well-being agenda is now also a big part of political strategy. Politicians and think tanks in countries as far apart as England, Finland, and Australia are bringing well-being and happiness to the political arena, while others, e.g., Bhutan have always held it centrally. From implicitly addressing it-through, e.g., health, wealth, and housing-to explicit use of the term 'well-being' and a wider sense of 'happiness' itself.
Environmental	Home, living, nature, global	Living environment has long been seen as an issue for health and well-being, from the pioneering work of people like Edwin Chadwick. Although the negative effects of poor housing on well-being continue to be documented, even relatively good-quality housing is now being highlighted as potentially damaging to inhabitants well-being. New housing developments, e.g., have been shown to undermine the well-being of young families with lack of gardens, parks, and play areas. Wider reflections of the importance of environment to well-being are reflected in the development of such measures as NEF's Happy Planet Index.
Emotional	Self-image, personal growth, self-esteem	The Western individual, emerging through the subjective turn and consolidated through the reflexivity of contemporary society is at the heart of current conceptualizations of well-being. Here well-being implies a sense of agency and the ability to live a life that is experienced as meaningful. However the obsessive consumption driven individualization permeating Western society also means the widespread promotion of regimes of health, well-being, mind, and the body beautiful are frequently motivated by fear campaigns that create false needs and induce feelings of personal and emotional ineptitude, thereby undermining emotional well-being.
Spiritual	Spirituality, faith, inner peace, life path	Historically spiritual awareness and development was a fundamental part of well-being, be this through self-exploration, holistic treatments for illness, or as part of organized institutional religion. However, with the rise of rationality and modernity, a practical drive to find well-being rooted in the empirically observable physical body lost this edge. To some extent however spiritual well-being is reemerging as an essential part of the overall mix. Western society now sees a mix of serious spiritual path finding, as well as an element of susceptibility to the latest consumer trend in the search for spiritual fulfilment.

Figure 3: Aspects of wellbeing. Retrieved from: MacKian (2009)

Children and Young People

NB. Kenny (2010) is the only literature on this topic relating specifically to early years.

A theoretical, meta-analysis by Cudworth and Lumber (2021) considers the importance of the 'place' of Forest School, for providing a location of belonging and where children can connect to nature. They argue that the sense of place and attachment the children gain to the Forest in turn leads to the promotion of good mental health and wellbeing. Cudworth and Lumber (2021) aim to understand the spatialities of Forest School so as to frame the development of a connection to nature within a socio-spatial analytic. They conclude that Forest School provides many wellbeing and health benefits such as reducing anxiety, producing vitality and personal growth, and promoting happiness and life satisfaction.

Whilst this study may seem overly idealistic, a study by Tiplady and Menter (2021) investigated evidence for how Forest School supported wellbeing. The study focused specifically on the emotional wellbeing of groups of children and young people who were unable to access mainstream education in the UK due to severe anxiety and/or emotional, social, and behavioural difficulties. It was conducted in the north-east of the UK over the course of one year and intended to build confidence and wellbeing in the pupils.

The sample included students from two schools and studied around 25 pupils including some in the early years. However, a limitation of this study was that given the nature of the sample, some pupils left during the year and others joined the group later on. The fluctuation in size of sample, may have altered the group dynamic and reduced the volume of data produced. Using a mixed-methods approach, the study investigated the Forest School process through ethnography of the Forest School sessions, including participant observation, fieldnotes and informal interviewing as well as in-depth, semi-structured interviews with practitioners and school staff. The data was then analysed qualitatively through thematic analysis. The analysis identified four inter-related themes: engagement and enjoyment, relationships and interactions with others, perception of self and impact beyond Forest School.

Tiplady and Menter's (2021) study proposed a 'theory of change' in which Forest School would have an impact on the overall wellbeing and emotional health of the participants. They conclude that after one year of the study, there was not enough evidence that there was a significant impact on the emotional wellbeing of all the children and young people involved. However, the data did show that the impact was significant in specific ways and different depending on the child. They therefore propose Forest School as learner-led pedagogy in

which pupils can ‘take what they need’. For example, some of the pupils made significant progress in their skills in interacting with peers whilst others made progress in their appreciation of the forest as a place where they could relax.

Tiplady and Menter (2021) argue that as of yet there is no full meta-analysis of the impact of Forest School, elucidating the importance of this literature review in drawing together previously completed research. Furthermore, they contend that more longitudinal research is needed to provide evidence of the benefit of Forest School.

Despite this, one piece of longitudinal research was conducted over the course of three years by McCree, Cutting and Sherwin (2018) in south-west England. The study tracked 11 children (some starting in their early years) over the three years while they attended weekly Forest School sessions. The project was developed by the Wildlife Trust Youth Wellbeing Team who aimed to investigate the wellbeing benefits of Forest School for children who were disadvantaged on multiple axes i.e., socially, behaviourally, and economically. The study used a mixed-methods approach of various qualitative and quantitative techniques to allow for triangulation in attempt to improve validity and reduce bias. Data collection techniques included:

- All children interviewed every year using child-centred methods
- Two children selected randomly for further twice-yearly interviews to produce two in depth case studies. These interviews were conducted in a ‘den’ where the children completed drawing activities as prompts to help them share their experiences verbally
- Evaluation events were held for the parents at school including questionnaires and semi-structured focus groups
- Baseline and post-project questionnaires were collected from children, parents, and staff
- Further observations were made of the Forest School sessions with Leuven involvement scales used for wellbeing and involvement
- Quantitative data was also collected including the children’s school attendance and attainment along with a Connection to Nature Index applied on exit.

The rich data provided evidence of impact on the children’s wellbeing and academic development. Whilst a link can clearly be made between this study and learning and cognition, it is grouped under wellbeing and connection to nature. This is because the article links the development of self-regulation and resilience to the improvement of the children’s grades. The children also developed in confidence and their physical and social wellbeing.

As a result, the children attended class more regularly and their academic attainment across all subjects compared favourably with their equivalent peers.

McCree, Cutting and Sherwin (2018) conclude that through the children's participation, a gap was closed between the 'disadvantaged' cohort and other pupils in the school with regards to their attainment and academic development. They therefore highly recommend Forest School as an intervention for disadvantaged children to succeed at school. However, more research is certainly need in proving the link between wellbeing and academic attainment.

Social and Emotional Development

This research has not grouped any studies particularly under the rubric of social and emotional development. However, Tiplady and Menter (2021) and McCree, Cutting and Sherwin's (2018) studies, whilst considered through the lens of wellbeing, are intricately linked social and emotional development. Furthermore, many of the holistic studies consider aspects of social and emotional development such as the refinement of skills in communication and collaboration and the growth of attributes such as confidence and independence (Massey, 2005; Attwood, 2010).

However, some studies of older children show Forest School to be specifically beneficial for children's social and emotional development. For example, Swarbrick, Eastwood & Tutton (2004) use anecdotal evidence to demonstrate how Forest School develops emotional attributes such as self-esteem and social skills like teamwork.

Furthermore, a seminal study cited regularly in the literature is Roe and Aspinall's (2011) study of the restorative outcomes of Forest School for children aged 11. The study, based on an area of deprived, urban Scotland, investigated how Forest School could lead to the recovery of emotional and cognitive resources in children of different behaviour states. They concluded that Forest School had huge potential as a 'restorative environment'.

An interesting area for future research could be to see if these findings are reproducible with an early years sample. In an attempt not to generalize, these studies do not prove that Forest School is beneficial for the social and emotional development of pre-school children.

PHYSICAL ACTIVITY

Childhood obesity is considered to be one of the most serious global public health challenges in the 21st century (WHO, 2014). Obesity also causes concern for a plethora of other health problems. Statistics from 2012 show that around 28% of children aged 2 -15 were classed as obese or overweight (HSE, 2012), and this has only got worse over the last 10 years. A key solution to reducing levels of obesity in children and hence improving public health is through increasing levels of physical activity in children and young people (Austin, Knowles, and Sayers, 2013).

Forest School has huge potential as a physical activity intervention, providing a fun and exciting environment that encourages children to be active (Ephgrave, 2018). Regular physical activities provided at Forest School along with uneven terrain provide opportunities for both gross and fine motor skill development and improvements in stamina (ibid). Bilton (2002) argues that physical activity in an outdoor environment fulfils our human need for excitement and challenge at the same time as developing: agility, stamina, coordination, and strength. Forest School also allows children the space to move around freely, which is crucial to their physical development (Maynard, 2007).

As of yet, there are no studies which explore the effectiveness of Forest School at improving pre-school children's levels of physical activity, again elucidating a clear area for future research.

Some studies have been conducted with older children, such as Lovell (2009) who found through quantitative and qualitative analysis that Forest School resulted in higher levels of physical activity than both regular school days and days with physical education. However, Austin, Knowles, and Sayers (2013) found that Forest School increased physical activity levels compared to normal school days, but levels were similar to days with physical education. Despite this, there are other interesting findings such as Trapasso et al. (2018), investigating Forest School in the north-west, who found that both girls and boys enjoyed Forest School days more than both normal days and days with physical education. This is important, as enjoyment entails engagement with the intervention which is a critical precursor to other outcomes such as physical literacy. Furthermore, Lovell (2009) found that there were certain barriers to physical activity such as bad weather which were not relevant to Forest School. Whilst these three studies consider children of ages 7 to 11, future research must consider the impact of Forest School on levels of physical activity in pre-school children.

Accessibility of Forest School

The second aim of the project is to identify characteristics, such socioeconomic status and ethnicity of children, who access the Forest School programme.

Interestingly, this topic was hardly discussed in the literature with no articles discussing accessibility to Forest School specifically. Furthermore, in the literature on the effectiveness of Forest School, hardly any of the research went into any depth on the characteristics of children used in their sample. However, a trend did appear in that some of the later research, such as McCree, Cutting & Sherwin (2018) and Coates & Pimlott-Wilson (2019), started to discuss elements of characteristics of children who were accessing the programme. These elements included number of children with Special Educational Needs (SEN), number of children on Free School Meals (FSMs) and percentage of children of white ethnic origin.

It is imperative that research is done into this area since, even if Forest School is a highly effective health intervention, it will only exacerbate social inequalities if it is not accessible by all. This includes allowing Forest School to be accessed by all children regardless of axes of subjugation like race, class, and gender. A key area of interest may be to consider the relationship between intersectionality and access to Forest School. For example, a study by Natural England (2016) found that access to the natural environment by low income and black, Asian and minority ethnic (BAME) families was a huge area of concern. It found that children from BAME households were less likely to visit the natural environment (56%) compared to non-BAME households (74%). Furthermore, children from higher income families were more likely to visit the natural environment (77%) that lower income households (65%) (Natural England, 2016, p. 2). As well as this, it is also essential to consider the engagement groups have with Forest School. Just because Forest School is accessible to certain groups does not mean that it will be engaged with. Research must also consider how the natural environment is being engaged with by certain demographics, especially where such engagement breaks family norms.

This section will firstly cover what is available in the literature with regards to who is accessing Forest School and then explore the barriers to accessing Forest School. Given the lack of available literature on this topic, the views of practitioners will be incorporated into this section.

FINDINGS

In 'Forest School in practice: for all ages' Sarah Knight (2016) presents the findings of a questionnaire circulated of the 220 attendees of the 2015 FSA conference. Although this data is seriously limited in that only 59 responses were collected and due to the fact that it only represents one Forest School organisation, it still represents a good overview of who is accessing Forest School in the UK.

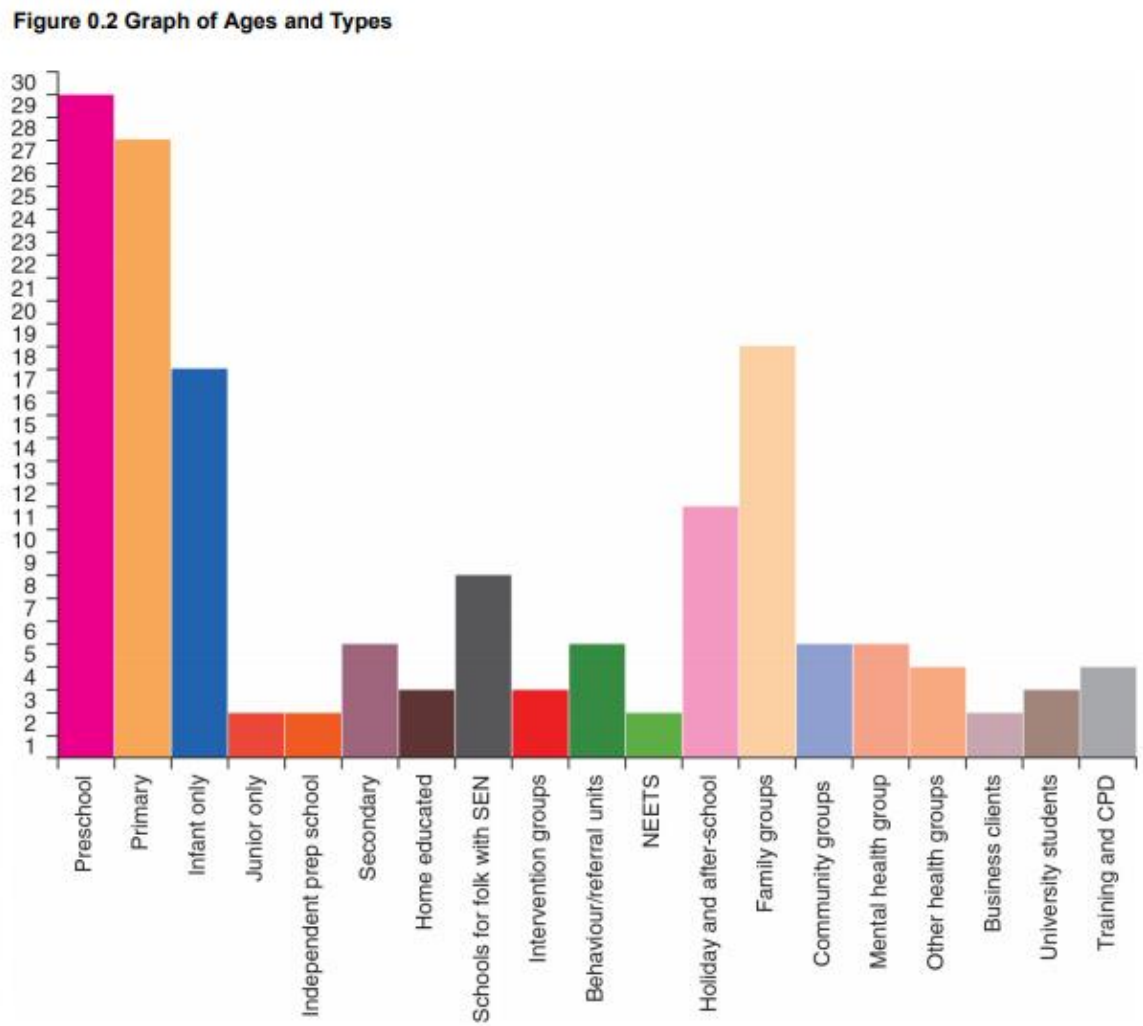

Figure 4. Graph of groups accessing Forest School. Retrieved from: Knight (2016).

The graph shows that a large diversity of groups in the UK access Forest School. Preschool is by far the largest group with 4 to 5 years olds remaining the most likely to participate in Forest School (Knight, 2016). However, Forest School seemingly appears to be accessible to all ages of children and young people in the UK ranging from the early years to teenagers, as well as adults and families (Murray & O'Brien, 2005)

Forest School appears to be accessed by children from all parts of the UK given the varying spatialities Forest School research covers. This includes the north-west (Trapasso et al, 2018), north-east (Tiplady & Menter, 2021), south-west (Kenny, 2010; Attwood, 2010), south-east (Harris, 2018), West-Midlands (Massey, 2005), East-Midlands (Coates & Pimlott-Wilson, 2019), north and south Wales (Murray & O'Brien, 2005) and Scotland (Roe and Aspinall, 2011).

Furthermore, anecdotal evidence from conversations with practitioners in the north-east of England suggests how Forest School could be more readily accessed in rural areas, with expansive open areas of woodland forest, but efforts were being made in urban areas too. For example, Harris (2018) describes how Forest School is being accessed by urban and rural areas alike. Roe and Aspinall's (2011) study was conducted on a Forest School accessed by two schools located in 'deprived urban areas of central Scotland.' Similarly, Attwood's (2010) study in Bath included many children who, prior to the research project, had little or no experience of play in natural outdoor spaces. Similarly, anecdotal evidence from the 'Forest School Play Project' in Bradford illuminated how, despite the urban landscape of Bradford, local parks often provide suitable areas for Forest School to be ran. However, the project believes Forest School is better practiced in larger, wilder areas and so often uses a mini-bus to transport children from the inner-city out into rural Yorkshire for Forest School sessions.

Deprivation and lack of access to funding is a huge barrier in access to Forest School, this is especially the case given the high cost of training to become a Forest school practitioner. For example, a full day of CPD for a school with Forest School provider OASES costs £500 (OASES, n.d.). However, OASES, has a 'model for sustaining practice' to make Forest School more accessible for lower-income areas. This model demonstrates how only one teacher in a school needs to be Forest School trained. The trained teacher can disseminate Forest School ideas to other teachers in the school so that all classes can participate in Forest School lessons. Then if the school wants to run a higher risk activity, such as making a fire or using sharp tools, then the trained teacher would run the session so that a duty of

care could be proved if necessary. Furthermore, since teachers move around jobs in different geographical areas, when a teacher leaves a school which has practiced Forest School, they then take their skills to the next school they go to. This means teachers with Forest School skills may move into schools which cannot necessarily afford the Forest School training. It is this model of sustaining practice, that leads OASES to view themselves more as Forest school facilitators for teachers rather than Forest School practitioners.

As well as this, funding appears to be available in some more deprived areas in the UK for the training of Forest School practitioners. For example, Berrington's (2012) study in Bradford highlighted how funding from Early Years Childcare and Play and Bradford Council's Workforce Development had provided free of subsidized places for over 100 people to take Forest School training. Berrington (2012) describes how, despite being a relatively deprived and urban area, Bradford has huge provision for Forest School. The Bradford Forest School Network, hosted by Bradford Community Development Project, had around 100 members at the time when the research was conducted and still a growing and thriving community today.

As highlighted in Figure 4, Forest School appears to be readily available for children with SEN and behavioural difficulties (Knight, 2016). This can be seen in the number of studies which consider the effectiveness of Forest School as an intervention for children in this group. For example, both the studies conducted by Tiplady and Menter (2021) and McCree, Cutting and Sherwin (2018) researched Forest School that was being provides to children with social and behavioural needs. However, whilst McCree, Cutting and Sherwin's (2018) researched children participating in Forest School from a school that had average levels of children with SEN and on Free School Meals (FSMs), the study conducted by Coates and Pimlott-Wilson (2019) was based on a school that had a below average uptake of FSMs and lower than average numbers of children with SEN.

Furthermore, Coates and Pimlott-Wilson (2019) and Kenny (2010) described how the schools participating in Forest School in their studies had a predominantly white student body. This perhaps suggests that Forest School is not as accessible to children of ethnic minorities.

However, this is extremely difficult to determine from the literature since only later studies start to consider the demographics of their samples. Just because there is research done on a particular demographic does not mean that the demographic is accessing Forest School in all areas of the UK. This could be said for the studies on children who are from

disadvantaged backgrounds. Whilst there is research to suggest Forest School is an effective intervention for schools in more deprived areas, this does not mean there is provision for schools in all these areas. Specific research must therefore be done into who is accessing the Forest School programme.

Despite this, anecdotal evidence shows that Forest School is being accessed by both children from disadvantaged backgrounds and children from ethnic minorities. For example, the 'Forest School Play Project' focuses specifically on children from disadvantaged backgrounds, since the programme is fully funded by bodies like the National Lottery Fund. In Bradford, this encompasses a demographic from a wide range of ethnic backgrounds including Pakistani, Polish, Bengali, and Romanian families. Due to cultural differences and socio-economic factors, often the children accessing the programme have hardly ever had access to open, outdoor spaces. The 'Forest School Play Project' is a fully funded, social enterprise, demonstrating how, where there is funding, Forest School is being accessed by disadvantaged children and children of ethnic minorities.

BARRIERS TO ACCESSING FOREST SCHOOL

Another area of interest hardly present in the Forest School literature is that of the barriers that prevent access to Forest School. Understanding the barriers to accessing such an intervention is critical to elucidating how accessibility could be improved.

One of the only articles in the literature that considers this topic is by Leather (2018) who offers a 'critique of Forest School'. Leather (2018) illuminates three issues surrounding Forest School. The first of these is the notion that Forest School is a social construction with a particular underpinning history and philosophy. This means that many practitioners are trained to deliver Forest School activities but have a lack of understanding of the underpinning values. Subsequently, this is problematic since it may lead to a difference in the quality of Forest School pedagogy being delivered. Given the financial barriers to Forest School, as previously described, difference in quality in Forest School practice could cause schools in more deprived areas to be disadvantaged. The fact that the children have access to the intervention may obscure the divergence in quality of Forest School pedagogy received.

A similar issue to this highlighted by Leather (2018) is that of the child-centred learning approach. Leather (2018) argues that a barrier to the implementation of Forest School is the difficulty of explaining the approach to parents and other professionals, especially when

Forest School pedagogy is vastly different to many of the discourses surrounding educational practice in the UK. For example, Leather (2018) highlights how the idea of 'Friluftsliv' may create a dissonance for UK educators. Furthermore, these issues were also highlighted through discussion with Forest School practitioners. These discussions elucidated how one of the largest barriers to the uptake of Forest School was explaining the importance of the child-centred pedagogy to teachers and parents. Practitioners explained how teachers and parents found it difficult to see the benefit of the unstructured play time that is central to Forest School practice. For the practitioners, further research is needed to present the evidence of impact to parents and teachers, especially head-teachers. Although based on practice in Canada, Boileau and Dabaja (2020) outline the presence of similar issues such as the lack of public understanding of Forest School and perception of risk. The need for schools to conform to standards of health and safety presents a huge obstacle to Forest School practice. Boileau and Dabaja (2020) also argue that there are pragmatic barriers to the uptake of Forest School such as the practice placing excess pressure on teachers with administrative work; difficulties in finding an appropriate site and problems with the use of Forest School sites like the lack of toilet facilities. These problems were also apparent in a recent Early Years survey conducted by RISE, a non-profit organisation in the north-east of England.

The final issue presented by Leather (2018) is that of the commodification of Forest School under the UK education systems hegemonic neoliberal ideology. Leather (2018) postulates that there is a risk of Forest School becoming standardised which would hence obscure its underpinning philosophy of creativity and freedom. Furthermore, if the market decides that Forest School should be the 'measure of competence' in outdoor learning, then this may mean other forms of outdoor learning are side-lined, losing access to funding and insurance qualifications. This in turn would reduce the accessibility of outdoor learning as only advantaged schools could offer the desired practice. Problematically, this goes against Forest School ethos. As discussion with practitioners highlighted, Forest School is no 'magical' form of learning, but simply a method by which children can be encouraged to get outside and learning in nature in a way that is designed to be accessible by schools. A similar argument is made by Sarah Knight (2018) who writes a response to Leather's (2018) criticisms. She argues that Forest School is one among many valuable approaches and that she would like to imagine a future where children and adults have as many opportunities as possible to engage with the outdoors.

The issues discussed by Leather (2018) are important when considering the future of Forest School practice. They each have implications for who can access the Forest School programme. Other areas of interest that could be explored in future research include the access of Forest School to children who are disabled or those who are on a pupil premium. Research could also consider differences in accessibility to Forest School between those that live in rural and urban areas. Spatial variations in access could be evaluated through the use of Geographical Information Systems such as Arc-GIS.

CONCLUSIONS

SUMMARY OF FINDINGS

It is difficult to make overarching conclusions about the effectiveness of Forest School for the early years given the size of the evidence base of research. With only 4 studies on the early years and 11 on children and young people (including early years), there is still much work to be done in the field of Forest School research.

Findings by the body of research previously done, suggest that Forest School may be a creative and innovative public health intervention. Considering Kurtz's (2021) vision of public health, viewing bodies as healthy and enjoyable, Forest School may offer a new approach to closing health inequalities. Research highlights Forest School as effective in improving social, emotional, and cognitive skills; physical activity and character traits such as confidence and resilience. But, not only this but it maintains Forest School as something fun and enjoyable, promoting wellbeing and imagination. These outcomes are foundational precursors for all the other health and developmental outputs since it is the initial engagement with Forest School learning that facilitates the development of various skills and capacities. This holistic approach to public health, understands health not to be a categorised, independent aspect of quality of life but is something interconnected to all aspects of what it means to be human. Teaching our children to enjoy being outside and thrive in natural environments has the potential to lead to a life-long desire for healthy living and connectedness with the world around us.

Despite the current socio-cultural climate, it is imperative that some of the most difficult global issues facing our world are tackled. Forest School may well have its part to play in the solutions of these issues. In a globe where the climate is changing, educational pedagogy that encourages an appreciation of nature and love of the natural world is key to the cultivation of a generation of thinkers curious about how to approach climate change.

Furthermore, the advent of Covid-19 has challenged how we view public health and reconceptualised many of the ways we relate to other people and nature. Whilst Covid-19 may have led to an obsession with cleanliness and hygiene, it has also presented the value of spending time outside. Relating to other people outdoors not only reduces our chances of contracting diseases, but it also promotes good physical and mental wellbeing which is critical to improving our bodies' chances of coping with illness.

AREAS FOR FUTURE RESEARCH

Many limitations of the current research on the effectiveness of Forest School and areas where future research is needed have been highlighted through this report. However, the following table provides an overview of some of the key limitations of the current research and makes suggestions of how future research could tackle these issues.

Discussions with practitioners elucidated the necessity for further research to be conducted. Practitioners described how the lack of a solid evidence base for the effectiveness of Forest School was a barrier to accessing funding for the practice to continue. This was especially in relation to the propensity of anecdotal and qualitative studies in contrast to quantitative, longitudinal studies. Furthermore, practitioners described how research was needed in order to provide evidence of the benefits of the practice to schools, in particular to head-teachers. Given time constraints and the need to align educational practice with the national curriculum, research is needed to demonstrate why Forest School should be provided for children in their early years.

Another area of interest may be consideration of the type of research design needed to best investigate Forest School. Given the breadth of ontologies and epistemologies used within Forest School research, there is an apparent tension between different research designs. Some studies conclude the need for longitudinal studies and randomised controlled trials whereas others argue that Forest School is better investigated through a phenomenological, interpretivist approach. Although in the vast ecosystem of educational and health research both have their place, some work needs to be done in considering the aims and outcomes of Forest School research and what such research is trying to achieve. For example, if longitudinal research is needed merely to prove the benefits of Forest School for academic attainment, perhaps research and funding is better placed challenging this culture rather than contributing to it.

Issue	Further Research
High propensity of studies with qualitative data analysis only (Murphy, 2020)	Need for research of a quantitative nature & consideration of impact on educational attainment
Emphasis on case study research designs that are short term	Need for longitudinal studies (Boileau & Dabaja, 2020).
Many studies are conducted on very small sample sizes and conclusions are generalized (Trapasso et al. 2018).	There is a need for future research to be conducted on larger sample sizes and conducted in different areas so that the reproducibility of findings can be tested. Generalisations should also not be made from the results. For example, just because the results show something to be the case for one particular age group this does not mean it can be extrapolated for all age groups
No studies on a pre-school age sample compare findings to a control group	In the study by Attwood (2010), conclusions were not made from the Strengths and Difficulties Questionnaire due to the absence of a control group. Future studies should compare benefits produced from Forest School with a control group to prove that it is Forest School causing the change rather than the natural development of children. Comparison groups should also be used to compare the effectiveness of Forest School in contrast to other forms of outdoor education.
Studies often take a holistic approach or consider a large range of social and developmental indicators	Some studies are needed that look specifically at the benefits of Forest School on physical activity and social & emotional development
Many of the studies make over-stated assumptions, such as correlation proves causation.	Research must consider health and developmental indicators in the context of the natural growth and development of pre-school children. The development of children's social, emotional, cognitive, or physical activity may not be related to the

	attendance of Forest School but instead due to other factors or their natural development. Whilst the counterfactual means it is impossible to fully isolate these indicators, this needs to be taken into more consideration in future research.
Hardly any studies (4) consider pre-school children specifically	Some more research needs to consider the effectiveness of Forest School for pre-school children
Very little information is mentioned about the demographics of children accessing Forest School	Research is needed to understand the accessibility of Forest School. It also needs to assess the extent to which Forest School is engaged with. Accessibility does not necessarily entail engagement.
Hardly any studies consider barriers to accessing Forest School	Future research could consider the barriers that prevent children from accessing Forest School and consider how Forest School pedagogy could be improved considering the criticisms of Leather (2018).
No research has been done comparing Forest School to other forms of outdoor education	Current research highlights many of the benefits of Forest School but it is difficult to extrapolate whether it is Forest School specifically that is producing these benefits or if it is simply spending time outside. Future research needs to consider what aspects of Forest School are stimulating benefits in children. Forest School also needs to be compared to other forms of outdoor education. This is important because Forest School has many barriers which could be overcome if the practice could be altered.
Research is often done by Forest School practitioners and is often funded by interested parties like the Forestry Commission e.g., Murray and O'Brien (2005). This introduces bias into the study since Forest School practitioners and associated stakeholders will be keen to find Forest School to be a highly	There is need for more sophisticated studies which triangulate multiple data sets over time. Studies should be done which include both independent researchers and practitioners in the field. Research can then incorporate the indispensable insight of practitioners, especially given the emergence of research frameworks like

effective pedagogy as the continuation of their practice depends on it (Austin, Knowles & Sayers, 2013).	'action research' and 'practitioner research', and the relatively non-biased research of independent parties.

Figure 5: Future Research into Forest School based on gaps made apparent from engagement with the current evidence base and discussion with practitioners.

IMPLICATIONS FOR POLICY AND PRACTICE

Despite the necessity for further research, implications for policy and practice can still be produced from the current evidence base.

One key area emerging from the literature was the need for a self-appraisal methodology to be used by practitioners. This is where practitioners are able to evaluate the efficacy of their own practice through considering the presence or absence of certain outcomes. The self-appraisal methodology could utilise frameworks such as that produced by Slade, Lowery and Bland (2013) which can be seen in Figure 6 below. This evaluative material was adapted from the 'Characteristics of Effective Learning' framework (Early Education, 2012). Slade, Lowery and Bland (2013) argue that the development of evaluation toolkits for teachers and Forest School practitioners can enable schools to carry out small scale research projects. This allows Forest School leaders to evaluate their own practice but also add to the growing body of research on Forest School.

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ENGAGEMENT

Finding out and exploring

- Showing curiosity about objects, events, people
- Using senses to explore the world around them
- Engaging in open-ended activity
- Showing particular interests

Playing with what they know

- Pretending objects are things from their experience
- Representing their experiences in play
- Taking on a role in their play
- Acting out experiences with other people

Being willing to 'have a go'

- Initiating activities
- Seeking challenge
- Showing a 'can do' attitude
- Taking a risk, engaging in new experiences and learning by trial and error

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MOTIVATION

Being involved and concentrating

- Maintaining focus on activity for a period of time
- Showing high levels of energy, fascination
- Not easily distracted
- Paying attention to details

Keep on trying

- Persisting with activity when challenges occur
- Showing a belief that more effort or a different approach will pay off
- Bouncing back after difficulties

Enjoying achieving what they set out to do

- Showing satisfaction in meeting their own goals
- Being proud of how they accomplish something – not just the end result
- Enjoying meeting challenges for their own sake rather than external rewards or praise

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CREATIVE AND CRITICAL THINKING

Having their own ideas

- Thinking of ideas
- Finding a way to solve problems
- Finding new ways to do things

Making links

- Making links and noticing patterns in their experience
- Making predictions
- Testing their ideas
- Developing ideas of grouping, sequencing, cause and effect

Choosing new ways to do things

- Planning, making decisions about how to approach a task, solving a problem and reaching a goal
- Checking how well their activities are going
- Changing strategy as needed
- Reviewing how well the approach worked

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PERSONAL AND SOCIAL DEVELOPMENT

Making relationships

- Co-operating in an activity; taking turns
- Negotiating with peers
- Showing empathy towards others' needs and feelings
- Developing positive relationships

Self-confidence and self-awareness

- Trying new activities
- Expressing personal preferences
- Verbalising own ideas confidently
- Selecting resources
- Showing appropriate levels of independence and help-seeking

Managing feelings and behaviour

- Verbalise understanding of own feelings, behaviour and its consequences
- Working in a small or large group
- Following rules
- Showing adaptability

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Figure 6: Evaluation toolkit for Forest School developed by Slade, Lowery and Bland (2013).

As well as the need for the evaluation, Slade, Lowery and Bland (2013) also make more pragmatic suggestions for future practice. Through interviewing parents and staff, they found that children would receive greater benefit from Forest School if they could be involved with a greater longevity of sessions or if sessions could be distributed through-out the year. This is so that different seasonal opportunities could be utilised, and children could experience the Forest in different conditions. This finding is interesting as the UK model of Forest School, as described by the FSA (n.d.), is characterised by a long-term process that happens over at least two seasons. Hence, Slade, Lowery and Bland's (2013) suggestion highlights the importance of keeping to the specific Forest School pedagogy and keeping up to date with the latest Forest School guidance.

Another suggestion made by Slade, Lowery and Bland (2013) is the need for parental involvement in Forest School. As previously described, the lack of understanding of Forest School philosophy and ethos by parents and teachers is in many cases a barrier to the uptake of Forest School. Therefore, it is important that parents are well-informed about the purposes of the practice and that parents have the opportunity to view the practice itself. This was also illuminated as critical through discussions with practitioners, who often encourage parents to be involved in the sessions. Practitioners argued that for Forest School to have 'ripple effects' beyond the sessions, it is important they are engaged with and inspired by the practice. Through parental involvement, parents are more likely to provide opportunities for outdoor learning outside of school hours, hence encouraging families to have a healthy, active lifestyle and to create a learning climate for their children.

A final suggestion made by Slade, Lowery and Bland (2013) is that Forest School sessions should be planned through liaising with school teachers and parents, meaning that the level of structure within a Forest School session can be gauged. Tensions were apparent in the interview data in relation to the level of freedom children should have whilst at Forest School. This is something that was also observed from the Forest School practitioners, as there was huge differentiation in the level of 'free-time' versus 'activity time' in the practitioners' session styles. Although there are certainly benefits of both, it is important that Forest School practitioners are able to gauge their practice based on the cohort of children they are working with. For example, when working with a group of children who do not regularly have access to a natural environment then it may be beneficial for more emphasis to be placed on free time, providing the children with the opportunity to explore and discover the natural world for themselves. In contrast, if working with a group of children who often spend time in natural spaces, then more emphasis could be given to structured activities. Through this, time is

given to changing the children's perspective of the natural world around them and teaching them skills which they may not be able to gain independently.

Whilst the current evidence base highlights these as recommendations for practice, areas of improvement for policy emerged from discussions with practitioners. From one discussion arose the necessity of a systematic way of ensuring Forest School standards. As there is no central body of Forest School, there is no current way of maintaining standards in Forest School practice or what could be described as an 'OFSTED' equivalent. Furthermore, there is a huge variety in the quality of the sessions being produced. To circumvent this issue, as described by the practitioner, there could be different 'levels of Forest School' awarded to schools (and perhaps practitioners) based on what is practiced in the Forest School and how often it is done. This accreditation could then be given for a certain length of time and then re-evaluated. For example, a school could hold a 'Forest School Gold Level' for the period of 3 years.

Finally, another issue arising from discussions with practitioners was the need for quality outdoor spaces where Forest School could be held. There are tensions between Forest School practitioners who would like natural spaces to be left 'wild' and local councils and authorities who would rather such spaces be managed and maintained. Thus, there is a need for policy to evaluate the use and potential-use of different outdoor spaces and manage the area in alignment with this. This is especially the case in urban areas where local parks are often the most accessible location for Forest School sessions to be run.

To conclude, both the current evidence base and discussions with practitioners, highlight that Forest School is something that should continue. Although there is a need for more research into the effectiveness of Forest School, the absence of any evidence that suggests that Forest School is in any way harmful means that currently there is no reason why the practice should not continue. Having been practiced in the UK for now over 20 years, there are certainly barriers to practice and ways that the practice could be improved but overall, there is no evidence that harm has been produced as a result of Forest School. Since, the literary evidence base and anecdotal evidence from practitioners and stakeholders suggest that Forest School is beneficial, it is hence worthwhile to continue to promote the practice across the UK. Forest School appears to be an effective intervention at contributing to the holistic development of children. This is in a way that provides them with an array of cognitive, emotional, and social skills needed both for learning, and hence academic attainment, and development beyond the classroom. However, Forest School is also an

opportunity to increase the overall wellbeing of children, encouraging them to live, healthy active lifestyles and take enjoyment from the world around them. Since happiness and wellbeing produce an optimal environment for learning, these outcomes hence are integrated into a virtuous circle. This, along with other benefits such as developing an appreciation for nature, central to tackling climate change, means Forest School may go some way to producing a brighter, happier, and healthier future.

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APPENDIX

APPENDIX 1: TABLE OF STUDIES

		Studies included in literature review									
Health & Developmental Indicators	**Massey (2005)**	**Murray & O'Brien (2005)**	**Attwood (2010)**	**Kenny (2010)**	**Berrington (2012)**	**Harris (2018)**	**McCree, Cutting and Sherwin (2018)**	**Coates and Pimlott-Wilson (2019)**	**Barrable & Arvanitis (2019)**	**Tiplady & Menter (2021)**	**Cudworth & Lumber (2021)**
Learning & Cognition	■	■	■	■	■	■	■	■	■		
Wellbeing & Connection to nature	■	■	■	■			■			■	■
Social and emotional development	■	■	■	■	■		■	■		■	
Physical Activity		■	■		■			■			

Blue square = study contains health/ developmental indicator

N.B. other studies have been included to provide context for some of the discussions in this report.

APPENDIX 2: STUDY DETAILS OF INCLUDED STUDIES

Study details	Characteristics of included children	Study methodology	Outcome measures	Study results
Massey (2005). Worcestershire		Longitudinal, participatory case study. Conducted over one year. Sample included eight 3–4-year-olds. Mixed-methods approach, using a combination of questionnaires, informal interviews, anecdotal logs, camcorder recorded observations, involvement time observations and photographs.	Holistic development.	Developed confidence, self-esteem & independence. Grew in friendships & relationships Provided context for language development. Developed problem solving & decision-making skills.
Murray & O'Brien (2005). Wales and the UK.		Participatory approach. 2 phases. First phase development of propositions of the benefits of Forest School and the second phase tested the propositions. 24 children's progress tracked over 8 months. Mixed-methods approach, including storyboard exercise, onsite data collection and analysis, reflection posters by practitioners and additional feedback from parents and teachers in the form of questionnaires and interviews.	Holistic development.	Forest School is a highly effective intervention. Some children displayed significant & surprising behavioural change.
Attwood (2010). Twerton, Bath	Children involved in project had limited or no experience of play in natural outdoor spaces.	Conducted over six weeks. Sample pre-school age (3-4 years). methodology included: observations, a strengths and difficulties questionnaire (SDQ) and a Leuven involvement scale (LIS). The data produced was then analysed both qualitatively and qualitatively through thematic analysis and statistical testing.	Holistic development.	Most significant change in self-esteem & confidence; physical skills and relationship with the outdoors. Some changes were also observed in levels of creativity and imagination; levels of motivation and concentration and the development of language and communication skills. The least change was seen in the ability to work co-operatively and gain an awareness of others.

Kenny (2010). Bath, Somerset	School participating in the study consisted of pupils who were nearly all of 'White British descent'.	Interpretive, ethnographic case study. Conducted over 5 weeks. Mixed-methods approach (various methodologies). Quantitative and qualitative analysis.	Learning, wellbeing and development.	Forest School beneficial for wellbeing and learning.
Berrington (2012). Bradford		Interviews with 8 Forest School practitioners. Anecdotal, qualitative.	Holistic development.	
Harris (2018). South East England.		Qualitative, theory building approach. Semi-structured interviews with FS practitioners from different cluster groups. 20 people in sample.	Learning and cognition	Benefits of FS as an outdoor learning space. Forest School provided children with new opportunities to interact and learn. Challenged dichotomy between teacher and learner.
McCree, Cutting and Sherwin (2018). South-west England.	School participating in study had similar to national average levels of children on FSM and children with SEN	Longitudinal study. Study tracked 11 children, some in their early years. Mixed methods approach (various methodologies). Analysed quantitatively and qualitatively.	Wellbeing and learning.	Positive impact on wellbeing. Developed self-regulation & resilience. Increase in attendance and academic attainment.
Coates and Pimlott-Wilson (2019). East Midlands.	School participating in study had a predominately white student body; below average uptake of FSM and lower than average numbers of children with SEN.	Exploratory, phenomenological. Conducted over Six weeks. 2 schools one providing Forest School to Year 4 (8–9-year-olds) and one providing it to the Foundation Year (4-5 year olds). Semi-structured interviews with 33 children as well as head-teachers and practitioners. Participatory activities were included in the interviews & photographs were taken. Interview data analysed qualitatively through thematic analysis.	Holistic development.	Experiential learning. Forest School inspires curiosity & desire to learn.
Barrable & Arvanitis (2019)		Anecdotal. Forest School as an intervention for younger children.	Learning and Cognition.	Development of intrinsic motivation. Self-determination theory. Forest School helps produce the optimal conditions for learning.

Tiplady & Menter (2021) North East England	Children with social, emotional & behavioral difficulties	Conducted over one year. Sample included 25 pupils of different ages including those in their early years. Mixed-methods – ethnography & semi-structured interviews. Analysed qualitatively.	Emotional wellbeing.	Not enough evidence that there was a significant impact on the emotional wellbeing of all the children and young people involved. Data did show that the impact was significant in specific ways and different depending on the child.
Cudworth & Lumber (2021)		Meta-analysis, anecdotal.	Learning and sense of place. Wellbeing.	Importance of connection to nature, belonging and sense of place.

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The information in this report/brochure is correct at the time of printing.