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Micro-dosing forest school? Children tell us what they think

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Abstract

Researchers from the School of Education and the Department of Social Work and Social Care have facilitated a number of forest school days with children from a local primary school on Kingston University grounds over a period of three years. These experiences give children an opportunity to engage in learning in the outdoors, which has clear cognitive and social developmental benefits. The forest school approach in England has been adapted from the Scandinavian pedagogy and retains the underpinning principles of child-led, enquiry-based and social learning. The fundamentals of forest school are to help children's holistic development, enabling them to become confident, independent and creative participants. Our time with the children offered an experience or taster of what forest schools can offer. We listened and responded to children's voices using appreciative inquiry methods. Forest schools and outdoor learning are very much

part of the social pedagogy tradition, but we do not pretend to have delivered a fully formed forest school experience. Children responded in ways that we had not anticipated. While it was clear that they valued the natural world and were adamant that it should be protected, they brought their own frames of reference to this in novel and unexpected ways. We concluded that forest school experiences, even in micro-doses, enable children's creativity and self-expression and have a contribution to make to future ecologies of learning and awareness of the natural environment and importance of protecting it. We also reflect on the relationship with the school, relative deprivation in the school community and the pre-existing environmental education and awareness in the classes.

Keywords social pedagogy; forest school; children; appreciative inquiry

Introduction and overview of research project

Researchers from the School of Education and the Department of Social Work and Social Care have facilitated a number of forest school (FS) days on Kingston University grounds over a period of three years. These taster sessions give children an opportunity to engage in learning in the outdoors, which is considered to have cognitive and social developmental benefits (Waite, 2010). This research centres on one particular session that was held with a class of year 3 children. We use appreciative inquiry to explore the children's responses to their experience alongside observations and impressions of the participating adults (Cooperrider and Whitney, 2005). The FS approach in England has been adapted from Scandinavian pedagogy in practice but retains the underpinning theories of child-led, enquiry-based and social learning (Harris, 2017; Mackinder, 2017). The key principles of FS are to assist children to develop holistically, enabling them to become confident, independent and creative participants (Forest School Association, n.d.). Our time facilitating the school offered an experience or taster of what FS can offer. As well as drawing on FS ethos, the researchers listened and responded to pupil voice within this research. The United Nations Convention on the Rights of the Child (United Nations, 1989, articles 12 and 13) states that children have the right to express their ideas and that their views should be taken into consideration. We consider that FS and outdoor learning are very much part of the social pedagogy tradition, but we do not pretend to have delivered a fully formed FS experience. Examining positive childhood experiences (Kallapiran et al., 2025) is in our view worthwhile in and of itself. We are, however, particularly interested in children's connections with the natural world and have therefore investigated whether even micro-doses of FS would impact on their environmental awareness and sense of place.

The rationale for the research is rooted in our views about children and learning. We believe that children should be asked about what and how they want to learn and that teachers are most effective when they know the impact of what they deliver (Hattie, 2012). Informal feedback from children and school staff following on from FS sessions that had been held in the three years leading up to this particular piece of research identified that children enjoyed the sessions and that a different type of learning was taking place. We believed that something unique and special was happening during these days when the children explored the freedom of play and interacted with nature. It was recognised, however, that our impressions from these micro-doses of FS were based on anecdotal evidence and we therefore planned to gather more structured data at a subsequent FS day that could be analysed rigorously and set within a theoretical context. Appreciative inquiry is an action research method intended to capture the views and experiences of participants, which focuses on assets rather than deficits of the explored experiences. Appreciative inquiry has been adapted for children in education settings (for example, Davies, 2013 and Lewis, 2015) as a social constructivist approach as initially described by Vygotsky (1978). In this paradigm, the research effort moves from collecting data to the collaborative creation of meaning between children, researchers and teachers. Our findings were emergent rather than deterministic and some of the outcomes were unexpected.

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Theoretical underpinnings

Defining forest school

FS has been explored and developed as a pedagogy in the UK since the early 1990s (Knight, 2009; O'Brien and Murray, 2007) and mirrors to some extent the increased understanding and profile of social pedagogy (Cameron et al., 2011; Hatton, 2013). Scandinavian uteskole provides the inspiration for much of what has developed in the UK, although the particular context and culture of UK FS is quite different in many respects (Waite et al., 2016). Although interpreted differently by diverse researchers and commentators, FSs have commonalities incorporating a child-centred approach that recognises children as unique individuals and competent explorers of the world that they live in. Adults are facilitators and power is shared as children learn holistically through play, curiosity and hands-on experiential learning in a safe, nurturing environment. The aim of FS is for participants to become healthy, resilient, creative learners who feel connected to, and understand their place within, the natural environment (Forest School Association, n.d.). Ideally FS sessions are regular and long-term; however, one of the driving factors leading to this research article is to explore whether a micro-dose of the FS experience can enable children to connect with nature and to begin to understand their place within it.

Environmental awareness and sense of place

Lifestyles in England have changed significantly in recent years, particularly due to the impact that technology has on work, play and social interactions. One outcome of this is the 'severing of the bond between children and the natural environment' (Rodrigues et al., 2016, p. 2). Mycock (2020) suggests that FS offers an opportunity to entirely rethink pedagogy in the Anthropocene era, offering ways of reconnecting children with nature as an autotelic practice, that is something engaged in without consideration of external reward or motivation: 'Learning is no longer a process that is pre-defined but is motivated and initiated by an individual's material surroundings that spark thoughts and actions' (p. 6). This chimes with Salonen et al.'s (2024) ideas of a 'planetary citizenship where the boundary between humans and the rest of nature disappears' (p. 2).

There are significant benefits of being outside in nature, for children in particular, as these experiences benefit them cognitively, physically, socially, emotionally and spiritually. Children who play in nature can develop an understanding and love of it that can subsequently lead to a respect and desire to protect the natural environment (Rodrigues et al., 2016). This environmental literacy (Rodrigues et al., 2016) is also encouraged by, among others, David Attenborough, who has stated that 'bringing nature into the classroom can kindle a fascination and passion for the diversity of life on earth and can motivate a sense of responsibility to safeguard it' (https://Foundationyears.org.uk). This has led researchers such as Tiriba (2010) and Sunnevåg and Nordahl (2008) to identify ways of enabling children to reconnect with nature, become active citizens and develop their knowledge of the environment and their place within it.

Coates and Pimlott-Wilson (2019) find that playing in nature helps children to become more aware of the environment and specifically to understand their body's place within it. This relationship with nature and the emerging sense of place can impact positively in emotional and physical ways and lead to the development of strong social and personal connections (Mackinder, 2017). It has been suggested that these relationships improve in the context of the natural environment due to the relaxed nature of the activities taking place there and the time that is allowed for interaction (Knight, 2009; Hill, 2013).

Social pedagogy

Social pedagogy is a well-established tradition with its own academic and research literature, which has gained currency in the UK more recently (Cameron et al., 2011; Hatton, 2013). Social-constructivist theory overlaps with social pedagogy and very much underpins the FS approach. Children are recognised as meaning-makers and competent learners (Malaguzzi, 2012). They learn within a community that explores together, drawing on curiosity and hands-on experience. Active participation is a key element of FS where ideas and meaning are shaped within a shared space (Dewey, 1956). The child is actively engaged in the real world as opposed to passively receiving instruction, bringing their own knowledge and cultural nuances to the process (Blackham et al., 2023). Communication is key and power is shared as adults become co-learners and facilitators during this process of co-construction (Bruner, 1985; Vygotsky,

1978). 'By changing the power paradigms, learners and facilitators engage in new ways of pedagogy, promoting congruence and trust' (Blackham et al., 2023, p. 166). This equal relationship is key in FS where side-by-side playing is a common feature, and children have the opportunities to lead and to teach their peers or adults.

Play

The ethos of freedom within FS allows children to explore their space and interact with it in a way that has meaning and interest for them. This particular 'learning atmosphere' (Blackham et al., 2023, p. 162) encourages children to make their own choices and to develop holistically through play, often in contrast to classroom learning that is directed and timetabled by adults. Coates and Pimlott-Wilson (2019) conclude that FS sessions can be seen as a break from routine and an opportunity for children to be in the present moment with time to integrate outside experiences into their existing schemas (Piaget et al., 1929). Play is recognised as a principal tool for experiential learning (Waite, 2010) encompassing elements of problem solving, decision making, exploration, imagination and creativity. There is also a highly social aspect of play as children interact with peers and adults, developing their thinking and social and emotional skills (Rogoff, 2008). Friedman et al.'s (2022) case study with autistic children identified that FS offers opportunities to play and to experiment with interaction in a 'low-stakes environment' (p. 17) enabling children to manage their emotions and to self-regulate. Leather (2018) also explores this element of play and experimentation although he also specifically links talk to the process, identifying that the freedom to physically and socially explore and interact enables children to 'own' the space.

Risk

Activities within FS encourage children to develop self-awareness through risk-taking (Knight, 2011). The exploratory ethos and freedom to take considered risks provides children with the opportunities to discover how their bodies work, how they fit into the natural space around them and how they can control actions and emotions (Brussoni et al., 2015). These risks will vary from child to child; it might be jumping from a tree, using a tool, holding an insect, or simply being in a woodland space or walking on uneven ground. Harper and Obee (2020) note the risk-averse context of Western approaches to child-learning and play and suggest that, 'a lack of risky, unstructured and sometimes even unsupervised play, may, in fact, be at a cost to healthy child development (e.g., reduced capacity for judgement, creativity, confidence and potentially increase phobias), and that the perception, or actual risk of injury is an essential element' (p. 184).

Harper and Obee go on to suggest that children's play spaces are designed to minimise risk of injury rather than to support child development, and in interviews with forest and nature school practitioners, found that: 'There was a distinct underlying assumption that children are competent beings; that they have the knowledge, skills, and abilities to manage in activities and environments they are exposed to when developmental norms are taken into consideration' (p. 188).

In a similar manner, Savery et al. (2016) argue that within the FS environment in particular, children are provided with a 'healthy approach' (p. 4) to risk taking through opportunities that allow them to identify, assess and manage situations based on knowledge of their own bodies and needs alongside an understanding of the natural environment.

Ethical approval

Ethical approval for the project was agreed by the Kingston University Research Ethics Committee. We received consent to proceed with the project through our initial contact with the school's senior management team and worked with the class teachers and teaching assistants to obtain signed and dated assent from parents and carers and consent from the individual children. Consents and assents included permission to use information gathered in the findings phase, including some feedback in the form of pictures. We received no funding for this project. The researchers have links with the school through previous FS days with a range of classes.

The school

The school is a local authority grant-maintained one-form-entry primary school in south London, retaining an 'Outstanding' grading in the most recent report from the Office for Standards in Education, Children's Services and Skills. The FS cohort were all year 3 pupils, aged between seven and eight years. The class is divided in two for teaching purposes, with two class teachers, two teaching assistants and an emotional literacy support assistant. The school offers a wide range of teaching and pastoral activity and has links with other local primary and secondary schools, with some links to private providers in the local area. It is a UNICEF's rights-respecting school; inclusion and diversity are actively celebrated and supported. The school has around 240 pupils, of which around 34 per cent are eligible for pupil premium payments, which reflects some of the disadvantage that the school community experiences and is much higher than the national rate of around 24 per cent (Clark, 2024; Department for Education, 2024).

The Department for Education (2024) publishes detailed information for all maintained schools in England. We do not provide links to the relevant data page as that would run the risk of breaching the confidentiality of pupils, parents and staff. The data shows that there are slightly more girls than boys in the school. Pupils with special education needs and disabilities (SEND) who have an education, health and care plan represent 4.7 per cent of the school population, which is nearly double the national average of 2.5 per cent. Pupils who have English and an additional language (EAL) represent 67 per cent of the population, far exceeding the national average of 22 per cent and even the London average of 44 per cent. In this particular class, more than half of pupils are eligible for free school meals (53 per cent), there are higher levels of SEND (40 per cent) and of EAL (87 per cent). Statistics only tell part of the story; our impression is of a lively and creative class who have strong support from their teachers, teaching assistants and the wider school community, including of course their parents and carers.

Appreciative inquiry

As noted earlier we recognise that children are 'competent social actors' (Dockett et al., 2011, p. 13). We have chosen appreciative inquiry as our research method as it has been previously adapted for children in education settings (Davies, 2013; Lewis, 2015), and we acknowledge the influence of social constructivist theories as initially described by Vygotsky (1978). We believe that this research method strongly aligns with social pedagogy traditions and practices.

As described by Cooperrider and Srivastva (1987) appreciative inquiry is an action research method of enquiry that focuses on recognising what is working well, what has enabled this to happen and what would contribute to its improvement. There are four stages in the process, as described by Bushe (2011):

1. *discovery phase*: define what we are learning about
2. *dream phase*: discover our findings
3. *design phase*: envisage how we could develop what we are doing
4. *destiny phase*: disseminate the results.

In our example, the discovery phase includes both the actual FS experience and the first part of the worksheet that we designed to get the children's feedback and ideas. We will briefly describe how the day went and then move on to the appreciative inquiry element of the project.

The discovery phase

Setting up the FS day involved working with staff to ensure we obtained written permission from parents and carers to go ahead, and at the same time ensuring everyone, including the children, were provided with information about the research element. We planned travel arrangements and what children would need to participate (appropriate clothing and lunch). The pupils travelled to the Kingston Hill campus by public transport and walked to the site. Our usual site had not been used since the pandemic and was somewhat overgrown and lacked sufficient space to be able to freely move around. Fortunately, the campus has quite extensive grounds, so we decided in advance to use another site. The area is large, fairly open and surrounded by trees (see Figure 1). There is no such thing as an ideal FS site. Interactions, learning and play are created by the participants, so the change was not significant.

Figure 1. The forest school site

We had a purposely limited plan for the day and knew that it would include a quick briefing about what the children could and could not do in the space, and how to be careful around fire when toasting smores (toasted marshmallows in biscuits). We suggested some activities that they might enjoy, but the main aim of our sessions is to let children create their own spontaneous play. Our experience is that children are endlessly creative in these spaces and we are reminded of Malaguzzi's 100 languages of children (Edwards et al., 2012) that highlights the numerous ways in which children are capable of drawing on their own resources when engaging in learning and creativity. On previous occasions children tend to make use of what they find on the site in creative ways, with minimal adult suggestions.

We collected the children from the bus stop outside the university. In previous years we had discussed the journey many times with different staff, and had been worried about the connections, taking children across busy roads and so forth. That was very much an adult perspective, and not at all what the children were interested in, which was the adventure of going on a journey. They are generally excited about going to a new place and ask many questions. We ensure everyone goes to the toilet before we go to the site and there are some health-and-safety issues that we must take into account. As noted by Beck and Ritter (1992) modernity creates the risk society, which extends into learning contexts. We had already completed the required risk assessments (both in the school and at the university) and we moved on to telling the children (and adults) about the boundaries of our site, rules of fire and related risks. Most of these were presented as a game; for example, if a child was further away from the group than they should be, we practised as a whole group shouting back so we could find them. We had one structured activity – making smores – and the rest of our time was dedicated to the children making their own use of the space as they saw fit. Rather than being dismissive of health and safety we can use it as a valid expression of pastoral care as described by Kyriacou (2009) as long as we maintain a social pedagogical ethos.

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As equal participants in the FS our Haltung (Charfe and Gardner, 2020) should of course encourage us to welcome and celebrate the fact that children bring their own worldview to any situation, even where, as we hopefully demonstrate below, what they bring might not fit comfortably with the expectations of FS. We have seen all sorts of play types (Paatsch et al., 2023) on our FS days and celebrate them all. The most important thing is that these are child-led. It is inspiring to see the creativity that children bring to unstructured play with minimal boundaries. Minimal equipment is also involved as we generally bring very little, apart from some string and scissors on occasion. Sticks are of course freely available but only allowed if foraged, and these are put to a lot of different uses. The principles of FS focus us on respecting the environment and leaving the site as we find it (Knight, 2009). This was explained to the children and modelled throughout the session. For the majority of the children the woods were an unknown environment and for all the children FS was a new experience, so it was necessary for the adults to support them in understanding how to respect the trees, plants and animals living in this space. Our expectations in this regard were high as we hoped that through this experience the children would develop a love of the natural environment and ultimately want to protect it, and indeed our assumption was that this would be their starting point in any event. Some examples of activities from this particular day include the following.

A mature tree had been blown over on the site and was at an angle to the ground. The children started to climb this and soon found how high they could get with some testing and discussion. Once they were at a suitable launching pad it was a short step to jumping off. A queue quickly formed to take turns, but this also involved some adaptations. The boys started to jump in the style of football players' goal-scoring celebrations and shouted out who they were imitating as they went. They seemed to have a huge store of these celebrations as they rarely repeated footballers' names, and the activity went on for quite some time; they might have been thinking about this while in the queue. While this activity mostly involved the boys, some of the girls also took part. One girl with limited mobility was determined to take part and was unquestioningly supported by all concerned to do so.

The children also created bug hotels and various improvised structures in the space (see Figure 2). From previous days we know that children often start off concerned about dirt and touching insects (see Figure 3), but this generally wears off after a time. Children become engaged in finding bugs and insects, digging for them or finding them in trees and often overcome their initial fear and *share* them. Bugs, such as woodlice (see Figure 2), are passed from hand to hand, invariably with a lot of care. On this particular day they found quite a few small caterpillars and, as they often do, spontaneously created bug hotels (see Figure 3). These developed into increasingly complex structures, and this was a common pattern for all their activities. Children's creativity, when allowed with minimal instructions and no particular end in mind, flourishes. Play is both solitary and social, with discussions, explanations and interactions freely taking place with minimal adult input.

Figure 2. Finding minibeasts

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Figure 3. Creating bug hotels

The most structured activity is the use of fire. We bring a small fire pit, and every child gets to make a smore. This is much more regulated than anything else we do and naturally requires preparation and detailed safety instructions for the children. We also have to ensure that the marshmallows and biscuits we use are all halal.

The appreciative inquiry class activity

Discovery phase

We arranged to meet with those children who had attended the FS in their classroom at their school. We described the discovery phase to the children, outlining what we were going to do and reiterating the format and the rationale for the research project. We included our intention to publish the research. We started by providing reminders of their experiences in the form of photographs from the event and introduced them to the task. We asked the children what they thought about FS and to write about this on simple forms that we provided for the dream phase. The pupils all engaged with this, assisted by the class teachers and researchers. They adapted the worksheet spontaneously by adding pictures. We took some brief notes, but our main focus was on helping the children complete the task. We facilitated whole-class discussion between each phase.

Dream phase

The children were overwhelmingly positive about their day, and this was reflected in their dream notes. As previously, the children often added pictures to their answers. We noted the frequency of keywords, most commonly mentions of bugs, insects and caterpillars (x13). Ideas about taking care of and looking after insects (and bugs and caterpillars) were also strongly represented (x9): 'You don't hurt caterpillars and spiders and different types of insects' (C22).

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Design phase

We asked children to create newspaper headlines as a way of enabling them to tell other people about FS. The intention here was to stimulate discussion and to focus in on what was most important to them about their experience.

Destiny phase

This final stage consisted of asking the children how they see FS develop further: 'What else could we do to improve FS?' 'What would you like to tell people about how to run FSs?' In this way the children had an opportunity to give their views on FSs to people outside the school environment.

We then generated a whole-class discussion about what the children had written to define the most important aspects of FS. Based on this discussion, we asked the children to create their newspaper headlines as a way of enabling them to tell other people about FS and how to improve it (design phase). The aim here was to envisage how we could improve the delivery of FS.

Data findings

The first stage of analysis of the questions from the children's forms that were completed in the second discovery phase was to identify keywords that had been used and to note their usage frequency. Data gathered from observations of, and interactions with, the children were also drawn on to provide triangulation when discussing and further analysing the findings (see Table 1).

Table 1. Frequency of keywords

Keywords	Q1	Q2	Q3	Q4	Q5
Bug, insects, caterpillar	11	2	13	2	9
Tree, jump, climb	16	4	3		3
Marshmallows	15	2		2	3
Football, sport		8			
Playground, slide, swing		14			
Animal homes		3			
Having fun			9	2	8
Super, fantastic				12	3

Question 1: 'The thing I liked best about forest school was …'

The children identified that they had enjoyed all the activities they engaged in during the FS taster day. Words that had the highest frequency of use in the forms were 'climbing and jumping', 'marshmallows', 'bug hotel' and 'caterpillars'. Children were also observed participating enthusiastically in these activities by the researchers, as described in the first discovery phase. Other words used fairly frequently were 'building a city', 'playing with a friend' and 'digging'; one child stated that 'no boring work' was the best thing: 'The tree climbing and making cities for a bug and roasting marshmallows' (see Figure 4).

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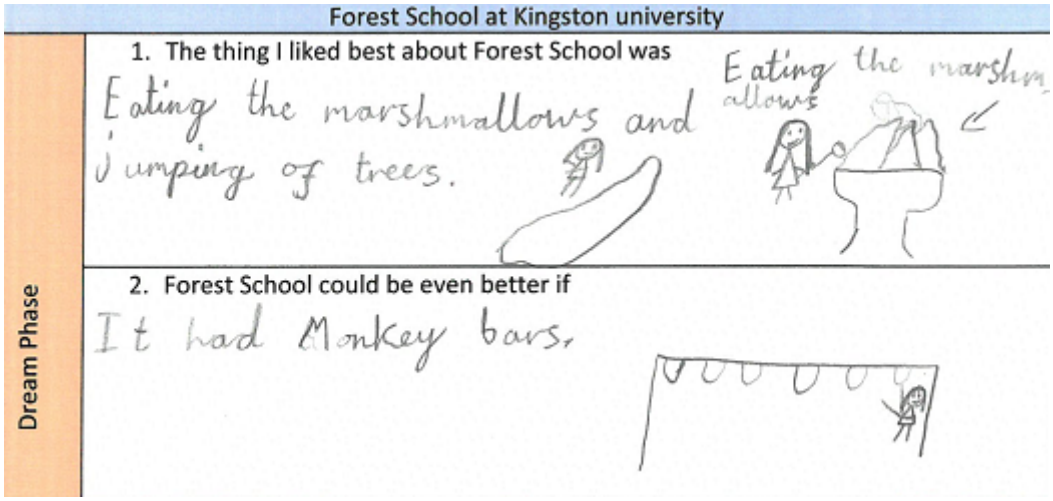
Figure 4. Child's feedback to question 1



Question 2: 'Forest school would be even better if …'

Answers to this question were varied and included practical elements, such as having lunch inside and having more marshmallows to toast. Some answers were creative but demonstrated a lack of understanding (or perhaps a sense of humour!) from the children with regard to the natural environment of this particular FS; for example, one child said that they would like to have sloths in the woods, and another asked for softer branches. The majority of answers to this question focused on play equipment such as slides, monkey bars, a football pitch, trampoline, bikes and scooters (see Figure 5). Children clearly bring their own context. Some children showed concern for the insects and animals in the woodland and stated that it would be better if there were more 'things' for the animals, with one child in particular suggesting a bug house: 'There was a little playground and a challenge which we have to build with sticks in groups'; and 'It had a swing or football pitch or the branches could have been a little softer.'

Figure 5. Child's feedback to question 2

Question 3: 'I think the most important things about forest school are …'

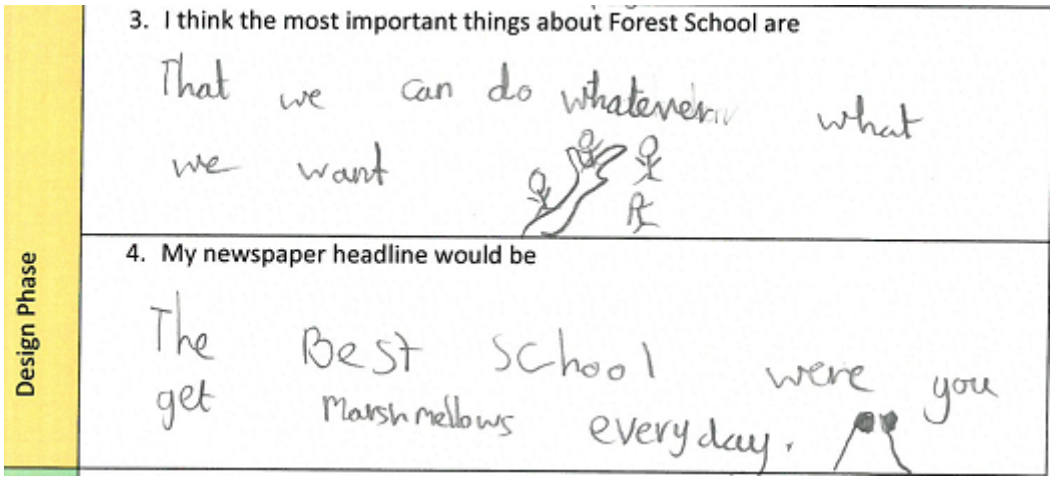
Again, the answers here were predominantly (16 of 27 responses) concerned with taking care of the space, and the insects and bugs in particular (see Figure 6). Having fun was mentioned 13 times with some overlaps: 'that we can do whatever what we want' and 'learning and exploring'. This was also confirmed by observations and discussions had with the children and their teachers at the FS as well as during the researchers' visit to the school afterwards. A few responses noted the importance of having adults around and being conscious of 'dangerous things'.

Figure 6. Child's feedback to question 3

Question 4: 'My newspaper headline would be …'

As might be expected some headlines were along the lines of 'THE BEST TRIP EVER IN WORLD HISTORY Y3s !!!' Many responses were about having fun, eating marshmallows and relaxing and not having to do lessons (see Figure 7). Again, children brought in their own social context, borrowing from social media and pop culture: 'The Forest School and [school name] collab'. Several responses reiterated the themes of taking care of the natural environment and insects in particular: 'Super school. Save insects'; 'Forest School lets you eat marshmallows!!!'; 'You don't need to do lessons'; 'Relaxing Forest School. FUN!'; 'The exploring Forest School'; and 'Many people should take care of animals and creatures to make sure no one should kill living creatures and take care of them.'

Figure 7. Child's feedback to question 4



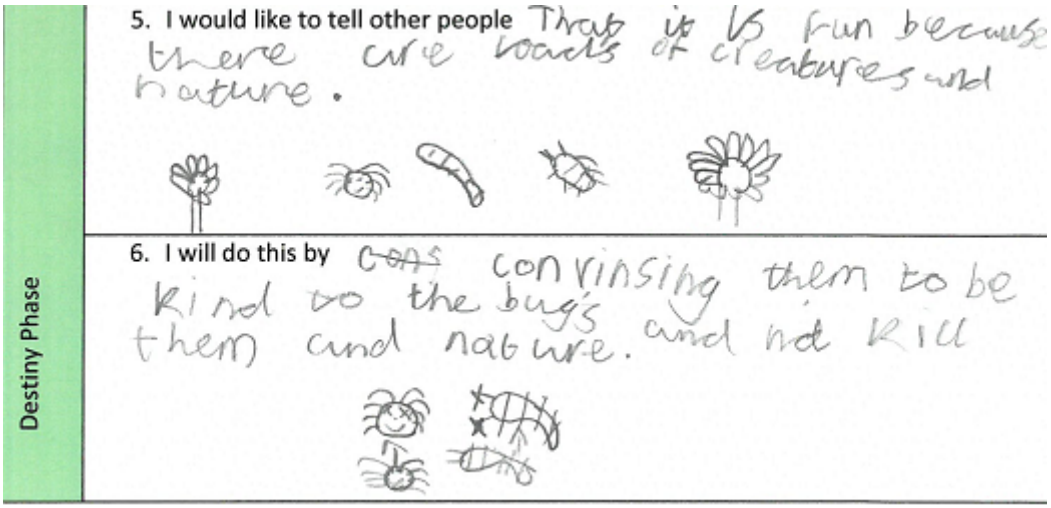
Question 5: 'I would like to tell other people …'

Again, similar themes emerge here about having fun, eating marshmallows, climbing trees and looking after insects. One child interpreted the question as wanting to tell 'my mum'. There were some interesting comments from children who had taken away new learning that they wanted to share, for example: 'if you like bugs there are many, if you don't they don't bite. You can terrifically toast marshmallows.'

Again, a sense of enthusiasm was a constant, and sometimes indications of a lack of previous engagement in the natural environment: 'that I went to Forest School and it was so amazing you should have seen it you can climb the logs' and 'that it is fun because there are loads of creatures and nature' (see Figure 8).

They also want others to know about the variety of bugs that are there, that they are safe to be with and that they need looking after: 'To make insects live for many years.'

Figure 8. Child's feedback to question 5



Question 6: 'I will do this by …'

This question was different in context from the other five on the form as it related specifically to the destiny phase. The children identified a variety of ways that they wanted to share their thoughts about FS, but the clear message coming through was that they very much wanted others to know about their experience and what they had learned from it: 'I will do this by telling people it is amazing and talking on the news' (see Figure 9). The children were very inventive in the range of ways they wanted to tell other people, including inviting 'random visitors', going to different people in different places to spread the word (Luton was mentioned for some reason), making a fun poster, getting a microphone and going on stage, telling stories, going on the news, posting it (presumably on social media), using billboards and writing a leaflet. Some children responded in this section with the message that they would share and the key themes coming through from this were about care for the environment, play, exploration and having fun: 'Convincing them to go to the amazing Forest School with me and I can give them a letter. DON'T KILL INSECTS!'; 'Using that time to play and my favourite bit eating MARSHAMLLOW [MARSHMALLOWS]!'; 'convincing people that it is super fun you should go there'; 'convincing them to be kind to the bugs and not to kill them and nature'; and 'talk to people to go there and look carefully so the tiny insects won't die.'

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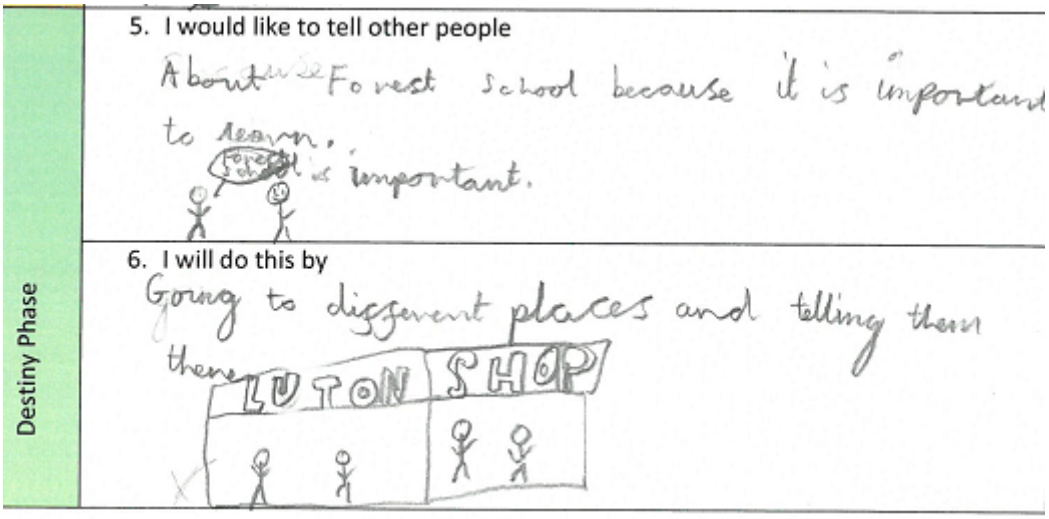
Figure 9. Child's feedback to question 6



Discussion

Environmental awareness and sense of place

All the 'best' things involved movement and senses; children were engaging in hands-on experiential learning, which was clearly a source of enjoyment. Social constructivist theory (Dewey, 1956; Vygotsky, 1978) was evident in the FS experience as children were actively learning within a social context. Talk was key alongside non-verbal communication in all activities as children made plans, shared their findings or encouraged each other to join in or take risks.

Children may not have been aware during this short space of time that they were finding their place and space in the environment, but it was evident, from our anecdotal feedback, admittedly with little or no analysis, to the adults observing and interacting with the children during and after the session that this had taken place. The children were navigating natural elements, finding out what could and could not be done with them, and learning how they as humans fitted within an ecological system; thus developing their 'environmental literacy' (Rodrigues et al., 2016).

It was observed that many of the children were not familiar with insects; they were initially unable to name them and some were wary of getting too close or picking them up. However, as the experience of this developed during the session, many of the children demonstrated high levels of interest and concern for these creatures (see the section 'First discovery phase'). Answers to questions on the form showed that this experience was memorable and that they held a respect for the natural environment. It is not possible to assess how a micro-dose of FS will affect these children's environmental views in the long term, but it is evident that this one experience has developed their knowledge of nature and at this time has impacted on their values and concerns for bugs in particular (Sunnevåg and Nordahl, 2008).

Social pedagogy

Children demonstrated that they were bringing their own lived experiences to the FS and drawing on terms of reference that were familiar to them (such as playground experiences) when trying to further develop the environment. It is not possible to state why this took place, but it could be that the children wanted to make the environment more familiar to them and to bring their own interests into the FS. It could also be that the children don't regularly have access to these play materials and saw the ethos of freedom, choice and enjoyment of the FS as an opportunity of accessing experiences that they would like to have. This aspect reflects Blackham et al.'s (2023) research, which identifies that, through active exploration at FS, children were bringing their own understanding, culture and personal nuances into their play and communication. It was evident through the answers given by the children on the form that

their experience at FS had been hands-on and exploratory. Their drawings and comments demonstrate curiosity and meaning making (Malaguzzi in Edwards et al., 2012). Observations made by the researchers in the forest and during the discussions at school also recognised that key aspects of social pedagogy were consistently underpinning the experience in line with the theories of Dewey (1956) and Vygotsky (1978) in particular. The children did not comment specifically about working and problem solving with others (adults included), but it was evident to the researchers that there was strong communication and co-construction of ideas in the forest; this ethos then continued during the feedback session in school.

Play

Children seemed to highlight the experiences that they had never had or rarely had before; exploration and new learning was key to this. The children engaged in the session through play, and in line with Waite's (2010) research, we recognised that this was their key tool for experiential learning. It was observed that initially they were unsure how to use the freedom and space allowed to them, but that, at varying paces and with different levels of support, they embraced the non-timetabled, non-directed learning that was offered to them. Blackham et al. (2023) identified that the ethos of FS contrasts with the more traditional learning that usually takes place in the classroom and that it leads to more holistic learning. This was evidenced through the activities that children engaged in during the micro-dose session. For example, when a small group of children were constructing a city using natural resources they used science, maths, technology and imagination to build structures; shared space and resources with others and communicated both verbally and non-verbally in order to plan and problem solve.

Risk

Much of the data regarding risk taking came from observations made by the researchers and teachers. As adults, we were aware that the children were out of the normal classroom environment and that most activities were new and to a certain degree challenging for them, therefore presenting an element of risk. For example, children were observed backing away from insects under a log at the start of the session but then picking up woodlice and allowing them to crawl up their arms later on during the day. The risks varied from child to child: some related to the bugs, others to climbing and jumping from the tree with different levels of support. Knight (2011) states that children have their own unique measures of risk and this was clearly demonstrated during the session. Teachers commented that children's behaviour was good, that they were sharing space and self- and co-regulating effectively in the outdoor environment. This resonates with Leather (2018)'s research findings that the forest offers a 'low-stakes' environment providing opportunities for physical, social and emotional development. Children did not comment specifically on the concept of 'risk taking', danger or challenge, although they did talk and write about exploring, having fun, climbing, jumping and toasting marshmallows. The children could not specifically identify risk using verbal or written vocabulary; however, they recognised that learning in the forest was very different from learning in the classroom and that they all felt happy and good about the adventures that they had had. Harper and Obee's (2020) research suggests that children are capable of managing themselves when given the opportunity in a supported and safe environment. Their findings align very much with the researchers' thoughts on this micro-dose of FS pedagogy experienced by these children.

Conclusions

This research aimed to listen and respond to pupil voice during and after a FS session, focusing on environmental awareness and sense of place in particular. Appreciative inquiry was used to capture the children's views and interpretations of their experiences as a means of finding information and collaborative creation of meaning. We recognise that a limiting factor of the project is that the data comes from only one session of FS and a follow-up discussion with the children who participated. This micro-dose of exploring in the outdoors, however, has yielded insightful findings about how the children engaged with the natural environment and their own interpretation of this. Children quickly developed a respect and interest in the natural world and started to explore their place within it, physically, cognitively and creatively. The children showed themselves to be active creators of play and constructed their own understandings of risk as competent actors. This led to the 'unexpected' outcomes in the research whereby children brought their own knowledge and cultural nuances to the session, both while engaging

with nature and when reflecting on the experience afterwards; giving a true child's perspective rather than the child's response that might have been 'expected' by the adults. There are clear limitations to the project; we are unable to see the longer-term effects of this micro-dose of FS on the children's engagement with the natural environment, and this is a small-scale qualitative study that does not pretend to generalisability. We suggest that further research with a group of children over an extended period would allow tracking of children's active learning and thinking processes over time and provide additional rich data to be explored. It would also be beneficial to explore further the perspective of teachers and other adults who are present at the FS sessions.

Declarations and conflicts of interest

Research ethics statement

The authors declare that research ethics approval for this article was provided by the Kingston University Research Ethics Committee.

Consent for publication statement

The author declares that research participants' informed consent to publication of findings – including photos, videos and any personal or identifiable information – was secured prior to publication.

Conflicts of interest statement

The authors declare no conflicts of interest with this work. All efforts to sufficiently anonymise the authors during peer review of this article have been made. The authors declare no further conflicts with this article.

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