

Can play in a natural environment have a positive effect on involvement and wellbeing within the Early Years compared to the indoors?

Abstract

Does experiencing a natural environment and being within greenery, carrying out gardening and exploring with sticks and stones promote involvement and wellbeing for young children?

Outdoor learning is not a new concept, Froebel (1782-1852), Montessori (1870-1952), Piaget (1896-1980), Steiner (1861-1925) and the Greek Philosopher Plato, all highlight the importance and benefits of learning in the outside world, loose parts, and greenery. Natural environments provide a calmer, quieter, and safer environment, providing natural items that are loose parts and promoting children's holistic development through encouraging a wide range of play types.

With promising research suggesting exposure to green/natural environments positively impacts mental health, although a natural environment. However, Nature and the outdoors is not equally available to all children, for many reasons, such as some urban schools may not have access to a natural environment and may be limited to a concrete playground. Many children may not experience the outdoors and nature, as childhood has been seen as changing, children are experiencing less traditional childhood activities and more technology (McDowall-Clark, 2020; Bond, 2014).

The research will take place in several schools and nurseries with children aged between 3 – 7 years old, comparing indoor play with one class and play outdoors with the other, with the focus on involvement and wellbeing.

Evidence will be gathered via mixed methods of research, using the qualitative Mosaic method, providing data through children's drawings, photographs, and informal interviews alongside the quantitative approach using the Likert Scale and Leuven Scale.

Triangulation will be achieved by sending out questionnaires to practitioners and parents/carers to capture their views on outdoor learning.

Key words: natural, greenery, wellbeing, involvement, outdoor, mosaic method.

Literature Review

Nature and Greenery benefits; Involvement, attention.

Can being within a natural environment with green spaces be a natural calming aid to promote curiosity, foster happiness, and wellbeing, for young children?

There are many studies that show natural environments have a soothing effect on young children. Research has shown that being within nature and green spaces seems to increase children's wellbeing by providing a calmer, quieter, and safer environment, therefore, children respond with less hyperactive behavioural traits (Kuo, Barnes & Jordan, 2019). This suggests nature has a calming influence with a beneficial effect on attention, involvement, and cognitive skills (Dockx *et al.* 2022; Fyfe-Johnson, *et al.* 2021). United Nation Children's Fund (UNICEF, 2020, p4), report children's experiences of playing outside and having the choice, increases their happiness and wellbeing. Furthermore, Piaget's (cited in Aubrey & Riley, 2016) theory that children are intrigued by their environment, by being physical and interacting with the environment from an early age develops the child's curiosity and learning.

Xiao, *et al.* (2021) study emphasizes the impact and importance of the sense of belonging within the community and argues that it can influence wellbeing and physically.

Maslow's theory would agree, stating the sense of belonging is feeling as an equal within a group, and sits within the area of physiological needs, along with feeling safe, and having needs met (Aubrey and Riley, 2017).

Within green and natural spaces, young children are encouraged to be calm, thus enhancing children's curiosity, imagination, creativity, happiness, and wellbeing, this then optimises their holistic development and mental health (Tovey, 2017).

Moreover, from being happier and curious, there is evidence that children are more physical within nature and greenery, therefore showing positive health exposure (James, *et al.* 2015).

Physical; health/well-being

The outdoors particularly a natural setting such as the woods, offers great physical opportunities helping to build gross motor skills, for example; jumping off logs, crawling under broken branches or carrying and lifting rocks, branches etc. The outdoor space provides children with multisensory experiences and physical activity, therefore encouraging children through play to explore and be curious (Tinney, 2020).

Additionally, Dockx *et al.* (2022) state, having exposure to nature and green spaces, supports the development of a stronger immune system, and a resilience to illness, compared to those who rarely come outdoors, according to World Health Organisation (WHO, 2019) there are concerns of the amount of inactivity of young children, and recommend children between 1 and 5 years old should have no more than 60 minutes of sedentary screen time, and at least 180 minutes of physical exercise throughout their day, as early childhood is where physical, motor and cognitive development is rapid, and foundations are developed for future habits.

Natural Resources Wales (n.d), claim the benefits of being in the woods for a day, would be 2.7 times more active than a normal school day. Additionally, being in a natural environment (a field, a park etc.), provides children with a health benefit, not only supporting a healthy immune system, but physical health, with physical activity offered in an abundance, children are surrounded by large space providing opportunities to run, jump etc and boasts multi-sensory experiences, being outdoors also provides the ability to set foundations for the child, for their future selves.

Authentic resources, natural loose parts, curiosity

Natural environments offer rich sensory experiences that simulates children's curiosity, for example, textures, sounds, colours, and the opportunities to explore imaginative play, and physical activity. Hargraves (2020), Identifies the Steiner Approach emphasises the importance of the outdoors, using authentic resources directed by their own interests, for example making a den from sticks, and moss.

McMillan (1919, cited in Murphy, 2022) stated the outdoors was critical for stimulation, exploration and experimenting through first hand experiences, which also provides ample physical activity. Additionally, children within the natural environment have opportunities to many authentic loose parts, developing the child holistically, but to name a few, curiosity, imagination, problem solving (Caldwell, H *et al.* 2023). Furthermore, The Welsh Curriculum (2022) highlight the importance of providing children with authentic, real-life resources and experiences, allowing children to create a relationship with their environment and develop a love for their world around them. Furthermore, children when engaged in learning that is presented as play, learning is likely to be higher and children are more engaged and interested in the activity, therefore the child is happier (Howard & McInnes, 2013).

Play in general has been much researched, considering the benefits on positive health and wellbeing. However, only 10 percent of children today play within the natural environment, compared to when adults were young, 40 percent (Dillon, 2014). According to Stead (2019) fewer children feel connected to nature, stating the fear and danger of strangers, traffic, and the lack of green spaces to access, he also highlights the increased usage of technology.

Summary

This literature review highlights the importance of children feeling safe and having the sense of belonging with others and the environment. Therefore, once children feel they belong, there are many benefits they can have and will thrive in natural environments. Benefitting physically, cognitively, emotionally, and socially. Integrating nature into children's daily lives is not just beneficial but essential to foster their holistic development and wellbeing for their future. Therefore, the natural environment enables children to reap the profound benefits that nature has to offer, providing authentic resources, loose parts and fostering positive relationships to be formed within the outdoor environment for life. Additionally, another benefit is increased physical health and a stronger immune system.

Methodological Considerations

This research aims to identify whether children are happier and engaged with their learning and develop holistically within their environment when outdoors, compared to a standard classroom. The research question is would the outdoors make a difference to children wellbeing, are children more engaged and involved when surrounded by greenery or natural spaces, with loose parts and authentic resources?

Sample

The research will be based in Cardiff, a city in Wales, UK, it will involve approximately 320 children aged between 3 and 7 from 8 different primary schools with a nursery. Some schools are in Victorian buildings with very little green spaces/natural areas, just a playground of concrete. Whereas other schools have ample green spaces, field, gardens, forest school, animals, etc. Some areas are known as disadvantaged and other areas are not, where children will experience differences from where they live and the experiences they encounter.

The research will be focused on the early years; nursery to year 2. The schools invited to take part have two classes in a year group, one class will experience more outdoor play, compared to the other given the same opportunities but indoors for a session (1 hour – 2 hours) every week, during the Spring – Summer term, where the weather will be warmer and fewer rainy days.

In each setting 5 children will be randomly selected from each class (of 30), to be the focus children. As random sampling is considered as more reliable (Hammond and Wellington, 2021). The random sampling will reduce the possibility of bias as children that may be viewed by staff as good participants will not be favoured over others (the Halo Effect) making the research more generalised and accurate. However, focus

groups, would allow powerful rich research through observations, the concern within groups some children may hold back, not wanting to talk within a group.

This research is with children from the age of 3 to 7 years old, prior this research, it would be good practice and Cohan (2017) emphasises the importance of building a good relationship prior to collecting qualitative research, to ensure a good rapport, therefore reducing the chances of tampered research, from the Hawthorne effect.

The Hawthorne effect originated in the 1920's, from being observed the workers changed their behaviour and increased their productivity and performance. Taking this into account when observing, participants need to feel relaxed and have well established relationships prior to the observations, this could take, days, weeks or even months (Oswald, Sherratt and Smith, 2014).

Method

This early year's research, starting with 3-year-olds, will look at the importance of providing opportunities and ways to listen and respond to the child's view (The Hundred Languages of Childhood Malaguzzi, 1996, in McDowall-Clark 2020. p130). The children will be given opportunities to draw, talk, take photos. While practitioners will take photos, observations and fill out the Leuven scale.

Therefore, the research approach will be mixed methods incorporating both qualitative and quantitative. The mosaic approach will provide qualitative data and a questionnaire will provide quantitative data. The mosaic approach allows the researcher to capture and live the experience alongside the child, and more importantly a large focus on the child's voice to be heard, verbally or nonverbally, supporting children with additional learning needs or English as a second language, from the use of photographs, drawings and interviews supporting rich holistic data (Harcourt, Perry & Waller, 2011; Clark and Moss, 2017).

Before the research begins, a questionnaire will be provided to parents and practitioners, gathering their views and perceptions of outdoor learning compared to indoors.

Throughout the research blends, quantitative and qualitative data, known as mixed methods in research, with the addition of Triangulation, involving mixed methods, and incorporating perspectives of others, i.e. questionnaires from parents and practitioners. This approach ensures greater accuracy and credibility by checking different perceptions and views and ensuring the data is the same between two or more sources (Walker & Solvason, 2014B; Bell & Waters, 2017; Roberts-Holmes, G, 2018). Newby (2014) emphasises that qualitative and quantitative methods together cannot validate each other but reinforce the data by comparison.

Mosaic Approach vs Ethnography

Choosing the Mosaic approach is relaxed, flexible and offers many non-verbal methods to listen to the child. Whereas ethnography method is similar in taking photos and interviews, observing and notetaking, it is a whole-body immersion (Madden, 2017). Furthermore, Hammond and Wellington (2017) state observations from ethnography can become too narrated, overly descriptive, and factual. Speldewinde (2022) describes his experience and identifies that when observing children in the outdoor setting there can be too many 'potential directions' but this provides rich and useful research, also encountering moments where children would invite the observer into their activity, highlighting the importance of knowing where to stand and not to refuse interaction, yet not be a part of changing it.

Moreover, from being immersed there is a higher chance of the researcher becoming bias. Ensuring the researcher remains neutral to attributes, reduces the 'Halo Effect' providing the research with a non-biased view. Thus, not allowing previous judgements of individuals which hinders the research, from the impression of something or someone

influencing the perception (Gabrieli, *et al.* 2021). For example, assuming a 'girly girl' in a pretty dress and shiny shoes, will not like or want to join in with outdoor learning, not want to get dirty, yet they may be the ones that are straight in the mud and getting dirty. There could be many areas around this, parenting, life experiences, disadvantaged.

The Mosaic approach enables the perspective of the child and their experiences, slowing down the research, reducing adult assumptions and allowing a more natural day to day experience, providing unique, genuine views (Clark and Moss, 2017; Mukherji and Albon. (2018). However, Lyndon (2019) identifies that some perceive the Mosaic approach to take advantage of the nature of school children, in a school setting, for their willingness to take part, and emphasises the chance of misinterpretation of the data causing the children to complete tasks as it is expected or apart of their day to day in school life causing tokenism.

Observations and Leuven scale

Observations offer the researcher a deeper understanding of what happens by watching the children and listening is a qualitative method (Newby, 2014). Staff will complete a record of this using a quantitative tool such as the Leuven Scale, created by Ferre Leavers (1994), to measure child involvement in free play within the outdoors natural early years environment. This has descriptors for each level; level 5 highest level of involvement to level 1 the least, the same for wellbeing (MacRae and Jones, 2019). Limitations to the Leuven scale, especially if the child has educational needs, or disabilities as behaviours show differently and may not appear on the scale.

Using observations, in a non-structured manner, allows the researcher to be a participant in the play, and note taking when required, but mainly using the Leuven Scale, the data can be triangulated and combined with the other sources of mixed methods within the mosaic approach.

Photographs, Map making and Drawings

During the process of the research children will be provided with opportunities of nonverbal processes which can reinforce the child's view and perception. The children will have access to using a camera, being able to capture what is important to them at that time; people, objects, area, enabling a child-centred approach and enabling an insight in to what the child enjoys, likes, dislikes, in a natural way as they can also capture interactions, and emotions (Newby, 2014). However, Sontag (1977, cited in Yamada-Rice, 2017), children taking photographs, may not show true reflection as the children maybe more interested in the device than the activity itself.

Additionally, they will be provided with drawing materials because this naturally engages children, drawing what matters to them and offering opportunities for talking, a conversation, not just answering questions in a relaxed more therapeutic way (McDougall, 2019). Furthermore, a study by Webber (2020), highlighting the benefits of drawing allowing the child to relax, before entering a conversation, especially with a child with Autistic Spectrum Disorder (ASD).

Both photographs and drawings can be collated into a book or map. However, map or book making, makes great use of photographs and drawings, but is time consuming, photo boards on the other hand, take less time, children's photos will be printed, and organised with the child, providing time to talk about the images (Lyndon, 2019).

Interview and questionnaire/survey/Likert Scale

This research will use simplified quantitative methods in the form of a questionnaire. The limitations of questionnaires are they are time consuming in formulating questions, piloting them, adjusting etc and then implementing them. The results will gather surface level information and tend to ask closed questions, and literacy and cognitive skills also play a part in questionnaires (Bartram, 2019). The advantages are they can effectively gather mass data from a wider sample. As this research is aimed for children within the

early years, their literacy skills and understanding are not developed enough for formal questionnaires to be used but a simple adult led survey could be completed with the child either rating their experience of outdoor play using a Likert scale or emotion symbols.

Informal conversations will be used with children one-to-one similar to unstructured interviews. This will provide rich qualitative views through a natural conversation, it is an accessible method for this research, by asking simple questions and listening to their views, will provide an insight of how the child is thinking and feeling (Winwood, 2019). During these one-to-one conversations this provides an opportunity to use a quantitative method, by asking the children to rate their enjoyment on a 1-5 Likert scale (Hammond & Wellington, 2021, pp. 156). However, due to limited language or cognitive development, or children may answer what they believe they should choose (Halo effect), the data may not be as accurate, therefore, the Likert Scale will need differentiating for the different ages and needs (Mellor and Moore, 2014) or the use of an emotional scale, with images of happy and sad, with the same value of 1-5.

Ethical Considerations

This study will use the mosaic method, between two classes in schools and nursery's, comparing free play indoors and outdoors, looking at whether the outdoors has a positive effect on involvement and wellbeing. The mosaic method consists of mini-informal interviews with children aged between 3 and 7, as well as supporting evidence using the Likert Scale, drawings, photographs, book/board work and observations using the Leuven Scale. There is also a pre and post questionnaire for parents and practitioners, to gain their views and opinions on outdoor experiences and learning.

The possible benefits of this study will be finding out the views of parents and practitioners, establishing if there are any negative views about outdoor learning that need addressing. This study will help provide evidence of the profound opportunities outdoor learning has holistically. The study will also enhance and encourage outdoor learning, providing children with physical exercise, igniting their creativity and imagination from using loose parts, creating overall calmer and happier children. No incentives will be offered other than the positive benefits and increased understanding the research hopes to provide.

Consent and participation

British Guidelines for Education Research (BERA, 2024; GDPR, 2018) suggest researchers should obtain consent at the start of the study, providing participants with information ensuring they are fully aware of what is involved and made aware they are able to withdraw their consent at any time. Bell and Waters, (2017) suggest participants should sign with a signature that they understand and consent to partake in the research, this can be done electronically or on paper. Considering this study is for 3–7-year-olds, their parents or carers will be providing consent on their behalf due to their age (NSPCC, 2023).

The world is a multi-cultural place, with different languages, therefore BERA (2024) draw attention to possible misinterpretations and effects of translation. Considering this, the parents will be provided with consent papers and information in their mother tongue, for some, an interpreter may be required to ensure parents understand.

Information the parents/carers will need to be aware of is what the research entails, what is expected from them and their child, the risks and that participation is voluntary. (NSPCC, 2023).

Keeping this in mind, after an end date for the consent to be provided, if any has not, a courtesy call or a copy of the letter can go home, if again this has not been completed, this could be a sign they do not want to participate or understand fully, for some people this may be confrontational, and they do not want to address this issue. Moreover, if a child does not want to give assent, this overrides the parental consent (NSPCC, 2023).

As the letters and consent are to go to all participants, if any have not provided consent to the study, these children will not be a part of the randomly selected sample.

According to BERA (2024, pp.16) these participants can still be present, and interactions with the randomly selected participants can be observed but will be completely anonymised. All signed consent received via paper should be scanned and an electronic copy kept, and the paper copy shredded, whereas electronic letters are to be downloaded (GDPA, 2018),

Confidentiality and Anonymity.

Confidentiality is ensuring the participant they will not be identified in the research whereas anonymity is ensures that even the researcher is cannot identify the participant (Bell and Waters, 2017). Within the research the participants will be promised confidentiality as the randomly selected children will be given Child A, B, C names, and only the researcher will know which children are a part of the research.

Anonymity within this study will be provided as questionnaires will be anonymous, the child will not be described, named, nor the school or area identified. However, the researcher, will be working closely with the children and will be able to identify the individuals and so will the school community, for example, Teacher, Teaching Assistant, will be aware (BERA, 2024). Additionally, if a child were to disclose a safeguarding matter, the researcher has a duty of care to follow the settings procedures, reporting to the designated safeguarded officer. Regarding the safeguarding of data UWTSD (2022) state that researchers are to discuss matters with the University's Data Protection Officer, who will support the researcher as well as follow legal and ethical obligations.

Reduce risk

Participant

Research with children can be beneficial, to gather information and hear their voices, however, the need to be honest and open with children and their parents is important and ensuring during the research process children should feel respected, safe and their wellbeing should not be hindered (NSPCC, 2023; BERA, 2024).

No harm should come to any of the participants, in accordance with University of Wales Trinity Saint David (UWTSD, 2022), research with children will require an ethics form approval, to ensure minimal risk to children, or to those with learning disabilities.

However, if a child were to disclose information, following the settings safeguarding procedure is vital.

The researcher

The researcher should be familiar with BERA (2024) as its priorities are the welfare of researcher as well as the participants, linking to safeguarding policies, the Data Protection Act, 2018 and GDPR.

The researcher will be organised, know the settings safeguarding lead and protocol following the Data Protection Act 2018, be truthful and accurate when using data or information from participants (UWTSD, 2022). Furthermore, respecting the rights of participants privacy (GDPR, 2018). Consent forms will be saved electronically, all data the children produce, i.e. photographs, drawings, and map/board walls that the children have taken and made will be downloaded also, being saved in a secure and password protected folder, identified and organised by the given code to the child (BERA, 2024; GDPR, 2018).

Additionally, good communication is essential, to establishing an accurate and trustworthy research, ensure the setting fully understands the purpose of the research, and that it is confidential. Colleagues will be asked for information relating to the children on a need-to-know basis ensuring any risk factors are identified (BERA, 2024; UWTSD, 2022). Moreover, researchers are to take responsibilities for liaising with the head teacher and other professionals throughout the study (Universities UK, 2019)

The researcher, following all the policies and procedures in consideration of ethical considerations will ensure reduced risk of misconduct in terms of fabrications, plagiarism or misrepresenting of data (Universities UK, 2019).

The University

Student researchers need to be mindful of Data Protection Legislation, emphasising the researcher needing to keep the data fair, transparent and accurate maintaining a professional, ethical manor, considering are representing the university (UWTSD, 2022). Additionally, Risk assessments, as stated previously, UWTSD stated when working with children an ethical approval would be required, and some research may require a risk assessment. Moreover, researchers through high standards will be representing the university needs to be, honest, be caring and respectful, ensuring the researcher is aware of all the policies as the university have robust and fair processes to investigate any misconduct.

Reference List

Aubrey, K. and Riley, A. (2017) *Understanding and Using Challenging Educational Theories*. London: SAGE Publications. pp. 5-17.

Bartram, B. (2019) 'Using Questionnaires' in Lampert, M. *Practical Research Methods in Education*. Oxon: Routledge, pp. 1-11.

Bell, J. and Waters, S (2017) *Doing Your Research Project: A Guide for First-time Researchers*. London: McGraw-Hill Education.

Bond, E. (2014) 'Understanding Childhood' in *Childhood, Mobile Technologies and Everyday Experiences*. London: Palgrave Macmillan, pp. 9-40.

British Educational Research Association (BERA). (2024) *Ethical Guidelines for Educational Research*. 5th edn. Available at: www.bera.ac.uk/publication/ethical-guidelines-for-educational-research-2024 (Accessed 30 May 2024).

Caldwell, H. (2023) 'Impact of an outdoor loose parts play intervention on Nova Scotian preschoolers' physical literacy: mixed methods randomized controlled trial', *BMC Public Health*, 23(1), p. 1126. Available at: <https://doi.org/10.1186/s12889-023-16030-x>.

Clarke, A and Moss, P. (2017) *Listening to Young Children: A Guide to Understanding and Using the Mosaic Approach*. 3rd edn. London: Jessica Kingsley Publishers.

Cohen, L. (2017) *Research Methods in Education*. London: Routledge.

Dettweiler, U., Becker, C., Auestad, B.H., Simon, P and Kirsch, P. (2017) 'Stress in school. some empirical hints on the circadian cortisol rhythm of children in outdoor and indoor classes,' *International Journal of Environmental Research and Public Health*, 14 (5), pp.475. Available at: <http://doi.org/10.3390/ijerph14050475> .

Dillon, J. (2014) 'The benefits of engaging with nature through learning in natural environments', *ECOS challenging conservation*, 35(2). Available at: <https://www.ecos.org.uk/ecos-35-2-summer-2014-the-benefits-of-engaging-with-nature-through-learning-in-natural-environments-justin-dillon/>

Dockx, Y., Bijmens, E-M., Luyten, L., Peusens, M., Provost, E., Rasking, L., Sleurs, H., Hogervorst, J., Plusquin, M., Casas, L and New route T-S. (2020) 'Early life exposure to residential green space impact cognitive functioning in children aged 4-6 years', *Environment Interational*, 161. Available at: <https://doi.org/10.1016/j.envint.2022.107094>.

James, P, Banay, R, Hart, J and Laden, F. (2015) 'A Review of the Healthy Benefits of Greenness', *Current Epidemiol Report*, 2(2), pp. 131-142. Available at: <https://doi.org/10.1007/s40471-015-0043-7>.

Fyfe-Johnson, A., Hazlehurst, M., Perrins, S., Bratman, G., Thomas, R., Garrett, K., Hafferty, K., Cullas, T., Marcuse, E and Tandon, P. (2021) 'Nature and children health: S systematic review', *Pediatrics*, 148(4). Available at: <http://doi.org/10.1542/peds.2020-049155>.

GDPA. (2018) *Managing User Research Data and Participant Privacy*. GOV.UK. Available at: <https://www.gov.uk/service-manual/user-research/managing-user-research-data-participant-privacy> (Accessed: 30 May 2024).

Hammond, M and Wellington, J. (2017) *Research Methods: The Key Concepts*. 2nd edn. Oxon: Rouledge.

Hargraves, V. (2020) *The Steiner Approach*. Available at: <https://theeducationhub.org.nz/the-steiner-approach/> (Accessed: 28 May 2025).

Howard, J. and McInnes, K. (2013) 'The impact of children's perception of an activity as play rather than not play on emotional wellbeing', *Child: Care, Health and Development*, 39(5), 737-742. Available at: <https://doi.org/10.1111/j.1365-2214.2012.01405.x>.

Leeson, C. (2014) 'Asking difficult questions: exploring research methods with children on painful issues', *International Journal of Research and Method in Education*, 37(2), pp. 206-222. Available at: <https://doi.org/10.1080/1743727X.2013.820643>

Lyndon, H. (2019) 'Mosaic: Participatory research in the early years' in Lampert, M. *Practical Research Methods in Education*. Oxon: Routledge, pp. 103-113.

Kuo, M. Barnes, M and Jordan, C. (2019) 'Do experiences within nature promote learning? Converging evidence of a cause-and-effect relationship' *Frontiers in Psychology*. Available at: <https://doi.org/10.3389/fpsyg.2019.00305>.

MacRae, C. and Jones, L. (2019) 'A Philosophical Reflection on the Leuven Scale and Young Children's Expressions of Involvement.

McDougall, J. (2019) 'Doing text: Madness in the methods' in Lampert, M. *Practical Research Methods in Education*. Oxon: Routledge, pp. 76 - 87

Madden, R. (2017) *Being Ethnographic: A Guide to the Theory and Practice of Ethnography*. 2nd ed. London: SAGE Publications.

McDowall-Clark, R. (2020) *Childhood in Society for the Early Years*. 4th edn. London: SAGE Publications.

Mellor, D and Moore, K. (2013) 'The Use of Likert Scales with Children, *Journal of Paediatric Psychology*, 39(3), pp. 369-379. Available at: <https://doi.org/10.1093/jpepsy/jst079>.

Mukherji, P. and Albon, D. (2018) 'Research Methods in Early Childhood. 3rd ed. London: Sage Publications', *International Journal of Qualitative Studies in*

Education, 36(2), pp.234-246. Available at:

<https://doi.org/10.1080/09518398.2020.1828650>.

Natural Resource Wales. (n.d) Being in the natural environment can increase childhood physical activity. Available at: <https://cdn.cyfoethnaturiol.cymru/media/689710/natural-environment-can-increase-physical-activity.pdf> (Accessed: 22 May 2024).

Newby, P. (2019) *Research Methods for Education*. 2nd edn. Oxon: Routledge.

NSPCC. (2023) *Research with Children: Ethics, Safety and Promoting Inclusion*, NSPCC Learning. Available at: <https://learning.nspcc.org.uk/research-resources/briefings/research-with-children-ethics-safety-promoting-inclusion>. (Accessed: 30 May 2024).

Oswald, D. Sherratt, F. and Smith, S. (2014) 'Handling the Hawthorne Effect: The challenges surrounding participant observer', *Review of Social Studies (RoSS): Methodological Choices and Challenges*, 1(1), pp. 53-73. Available at:

https://www.pure.ed.ac.uk/ws/portalfiles/portal/21376155/Hawthorne_RoSS_copy.pdf

Prins, J (2022) 'Nature play in early childhood education: A systematic review and meta ethnography of qualitative research', *Frontiers in Psychology*, 13. Available at: <https://doi.org/10.3389/fpsyg.2022.995164>.

Roberts-Holmes, G. (2018) *Doing Your Early Years Research project: a step-by-step guide*. London: SAGE Publications.

Speldewinde, C. (2022) 'Where to stand? Researcher involvement in early education outdoor setting,' *Educational Research*, 64(2), pp. 208-223. Available at: <http://doi.org/10.1080/00131881.2022.2064323>

Stead, M. (2019) Why children are spending less time outside – and what we can do about it. Available at: <https://www.wwt.org.uk/news-and-stories/news/why-children-are-spending-less-time-outside-and-what-we-can-do-about-it>. (Accessed: 29 May 2024).

Tinney, G. (2022) 'Outdoor Play' in Waters-Davies, J. *Introduction to Play*. London: SAGE, pp. 108-120.

Tovey, H. (2017) Outdoor Play. Available at: <https://www.froebel.org.uk/training-and-resources/pamphlets> (Accessed 19 May 2024).

Universities UK. (2019) *The Concordat to Support Research Integrity*. London. Available at: <https://www.universitiesuk.ac.uk/sites/default/files/field/downloads/2021-08/Updated%20FINAL-the-concordat-to-support-research-integrity.pdf> (Accessed: 31 May 2024).

UWTSD. (2022) *Research Integrity and Ethics: University of Wales Trinity Saint David*. Available at: <https://www.uwtsd.ac.uk/research/research-integrity-and-ethics> (Accessed: 25 May 2024).

Walker, R and Solvason, C. (2014) *Success with Your Early Years Research Project*. London: SAGE Publications.

Webber, L. (2020) 'Researching with children using Skype interviews and drawings: Methodological and ethical issues explored', *Journal of Early Childhood Research*, 18(4). Available at: <https://doi-org.ezproxy.uwtsd.ac.uk/10.1177/1476718X20938084>.

Winwood, J. (2019). 'Using Interviews' in Lampert, M. *Practical Research Methods in Education*. Oxon: Routledge, pp. 12-22.

World Health Association (WHO). (2019). Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age. Available at:

<https://iris.who.int/bitstream/handle/10665/311664/9789241550536-eng.pdf?sequence=1&isAllowed=y> (Accessed: 22 May 2024).

Xiao, Y. Miao, S. Zhang, Y. Chen, H. and WU, W. (2021). 'Exploring the health effects of neighbourhood greenness on Lilong residents in Shanghai', *Urban Forestry & Urban Greening*, 66, pp. 127-383. Available at: <https://doi.org/10.1016/j.ufug.2021.127383>.

Yamanda-Rice, D. (2017) 'Using Visual and Digital Research Methods with Young Children', in Christensen, P and James, A. *Research with Children: Perspectives and Practices*. Oxon: Routledge.