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An Evaluation of Forest School for Nursery Aged Children

by

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Glossary

ANOVA	Analysis of Variance
ASQ	Ages and Stages Questionnaire
ASQ-SE	Ages and Stages Questionnaire: Social-Emotional
BAS	British Ability Scales
BITSEA	Brief Infant and Toddler Social and Emotional Assessment
BPS	British Psychological Society
BTech	Bachelor of Technology
DECA-P2	The Devereux Early Childhood Assessment Preschool Program 2nd Edition
DfE	Department for Education
DfES	Department for Education and Skills
ECAT	Every Child a Talker
ECERS	Early Childhood Environment Rating Scale
EP	Educational Psychologist
EYFS	Early Years Foundation Stage
FOCUS	Focus on the Outcomes of Communication Under Six
FSA	Forest School Association
FSL	Forest School Leader
IBM	International Business Machines
IPA	Interpretative Phenomenological Analysis
IQM	Inclusion Quality Mark
LA	Local Authority
LOtCM	Learning Outside the Classroom Manifesto
MACL	Mood Adjective Checklist
NACE	National Association for Able Children in Education
NVQ	National Vocational Qualification
OAE	Outdoor Adventure Education
Ofsted	Office for Standards in Education
RCT	Randomised Control Trial
TEP	Trainee Educational Psychologist
SEN	Special Educational Needs
SCED	Single Case Experimental Design
SL	Speech and Language
SPSS	Statistical Package for the Social Sciences
UK	United Kingdom
UNICEF	United Nations International Children's Fund
VABS-II	Vineland Adaptive Behavior Scales

Abstract

Forest School promotes a child-led approach to education, through frequent learning in an outdoor woodland area. It was developed in the United Kingdom based on the early years practices employed in Denmark. The existing research has begun to generate some evidence of the positive outcomes of Forest School. There appears to be growing confidence in Forest School that is primarily based on non- experimental qualitative research. Therefore, the current research aimed to evaluate the impact of Forest School for nursery aged children, using experimental, outcome-focussed evaluation methods. The study utilised a pragmatic approach, employing a sequential mixed methods study design; the primary focus being the quasi-experimental element of the design, that included 11 children in both the experimental and control groups. The specific research outcomes were developed in collaboration with nursery staff using focus groups, thus, questionnaires were developed to measure social and emotional well-being and communication, pre- and post-intervention. This data is complemented by three case studies of children that participated in Forest School; analysed and presented using activity theory.

The quantitative results indicate that both the control group and experimental group made significant gains in social and emotional well-being and communication, suggesting that Forest School did not have a significant effect. The qualitative data, however, highlighted a range of outcomes and provided interesting information regarding the mediating factors which influence the children's Forest School experiences. The possible reasons for the quantitative outcomes are discussed, including the unique ethos and general outdoor practices used at the nursery setting in which the research took place. The data has also been considered in relation to the methodological weaknesses, such as diffusion of treatment, which may account for the disparity between the data and previous research. Although it cannot be concluded that the Forest School had a significant impact on the children that engaged in the sessions, the current research suggests that the use of general outdoor learning practices and teaching by Forest School trained staff had a positive impact on the social and emotional well-being and communication for all children.

1 Introduction

1.1 Researcher Interests and Background to the Study

The purpose of the current study was to evaluate the impact of Forest School for nursery aged children. The study was undertaken by a trainee educational psychologist (TEP) completing the Doctorate in Applied Educational Psychology at the University of Nottingham. The researcher developed an interest in Forest School following a visit to Maplefield Nursery[1], to observe Forest School as part of a doctoral training task. The Forest School Leaders (FSLs) spoke enthusiastically about the approach, and the visit inspired the researcher to investigate the impact of Forest School further. The Head Teacher was open to the idea of an evaluative research project being undertaken in their setting.

1.2 Stakeholders

The current research was conducted whilst the TEP was on placement in a local authority (LA); a large county in the East Midlands.

Staff at Maplefield Nursery were key stakeholders of the Forest School programme. The Head Teacher was a central stakeholder, given the investments made to train staff to become FSLs and deliver the weekly programme to the nursery children. Two FSLs were involved directly with the research, as they completed diaries and engaged in pre-intervention and post-intervention interviews.

Parents of the participants (children) provided consent for their children to take part in the research and were also asked to contribute to data collection.

[1] Nursery name has been changed to protect participant anonymity

The children involved in the research and those attending the nursery were also important stakeholders, as the nursery in which they attend and the Forest School they engage in was central to the research.

1.3 Aims of the Research

Forest School promotes a child-led approach to education, through frequent learning in an outdoor woodland area. It was developed in the United Kingdom (UK) based on the early years practices employed in Denmark.

The existing research has begun to generate some evidence of positive outcomes of Forest School. However, this is limited in scope with regard to the methodologies employed, and to a large degree the apparent growing confidence in Forest School is based on non- experimental qualitative research, or significantly compromised quasi-experimental research. The research sought to evaluate the impact of Forest School for nursery aged children, utilising experimental methods, to begin to address these methodological issues. The experimental research strand is also accompanied by a qualitative case study approach.

In identifying a focus and specific research questions, a wide range of relevant literature was consulted, and the views of the FSLs were sought through a focus group. Ultimately, the research sought to consider the impact of Forest School on the *social and emotional well-being* and *communication* of nursery aged children.

2 Literature Review

2.1 Overview of Literature Review

The first section of the literature review provides an overview of outdoor learning, with references to educational policies, theoretical underpinnings and research on outdoor learning for children. The review then considers the Scandinavian approach to outdoor learning and how this has led to the emergence of Forest School within the UK. Research that considers the impact of Forest School for children within the UK is then summarised and critiqued. The second section offers a systematic evidence synthesis review, in which a number of research papers on Forest School within the UK have been critically evaluated.

2.2 Outdoor Learning

Outdoor education has been described as "education in, about and for the outdoors" (Donaldson & Donaldson, 1958, p. 17) and can encompass a range of learning opportunities, including learning about nature, society, interactions and oneself (Dillon et al., 2005). Working with others, developing new skills and influencing conservation and society are just some of the activities involved (Dillon et al., 2005).

There are historical underpinnings to the development of outdoor learning in the UK that date back to the Victorian and Edwardian eras (Rickinson et al., 2004). The utility and understanding of the outdoor classroom has continually developed since then (Cree & McCree, 2012; Rickinson, et al., 2004) and it is argued that there is now a greater need for children to have contact with nature, due to changes in modern life and concerns around lack of physical exercise, mental well-being and climate change (O'Brien, 2009). However, there have been growing concerns that the opportunities for children to engage in outdoor learning have decreased

(Rickinson et al., 2004; Waters & Begley, 2007) and its potential benefits may not be fully considered in schools. This decline is suggested to be due to fear of various risks (Cree & McCree, 2013; Rea & Waite, 2009), such as strangers, traffic or violence (Maynard, 2007; Rivkin, 1998), the curriculum structure (Rea & Waite, 2009; Rickinson et al., 2004), rigid assessment systems (Rickinson et al., 2004) and insufficient access to outdoor spaces (Ridgers, Knowles, & Sayers, 2012). The following section discusses the policies that have been introduced over recent years that have attempted to address this decline.

2.3 Outdoor Learning and UK Education Policy

In 2005 the Education and Skills Committee in England completed a review of education outside the classroom (O'Brien & Murray, 2007). The decline in outdoor learning and the inconsistent approaches to outdoor learning across the country were highlighted, prompting the committee to suggest that more needed to be done to illuminate the benefits of such practice. This led to the production of the *Learning Outside the Classroom Manifesto* (LOtCM) (Department for Education and Skills, 2006):

> *"We believe that every young person should experience the world beyond the classroom as an essential part of learning and personal development, whatever their age, ability or circumstances".* (LOtCM, DfES, 2006, p.2)

Southall (2014) argues that the definition of 'outdoor learning' provided in the LOtCM i.e. "the use of places other than the classroom for teaching and learning" (DfES, 2006, p.1) lacks clarity and is not well defined, leading to professionals interpreting the approach in varying ways. Despite this, the LOtCM promotes the idea of giving all children the opportunity to access outdoor education. At the very least it suggests some degree of commitment from the government to increase outdoor learning, which has also been promoted by Ofsted (Office for Standards in Education: Ofsted 2004; Ofsted 2008), who suggest that schools should "ensure that their curriculum planning includes sufficient well-structured opportunities for

all learners to engage in learning outside the classroom as a key, integrated element of their experience" (Ofsted, 2008, p. 6).

2.4 Theoretical Underpinnings of Outdoor Learning

Experiential learning has been described as learning which relies on direct experiences, most commonly through actively engaging in problem solving (Higgins & Nicol, 2002). Outdoor Learning can be viewed as a mode of experiential learning, thus the theoretical foundations of experiential learning are of relevance here (See Figure 2.1). At the concrete experience stage, direct interaction with an experience occurs. Subsequently, the child engages in reflective observation which refers to a process of reflection about the experience and internalisation of the information. During the next stage, the abstract conceptualization stage, comprehension of the information occurs, and rules and generalisations are made about the experience. This then leads to the active experimentation stage, in which the rules and generalisations are tested (Roberts, 2006).

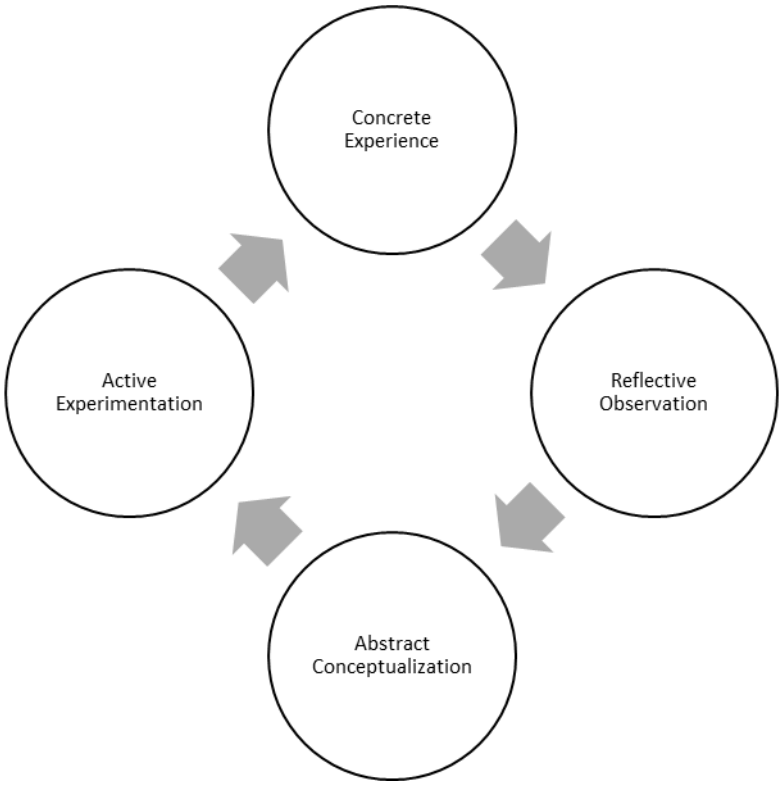


Figure 2.1: Kolb's experiential learning model (1984) taken from Roberts (2006)

Higgins and Nicol (2002) suggest that in the above model, experiences do not necessarily lead to learning, and that learners may need help with interpreting and generalising their experiences. This 'help' is proposed as the role of the teacher, who should review the target outcome in relation to the outdoor activity. Although the model does not explore the complexity of the processing of the brain, it does help in thinking about the educative quality of outdoor experiences (Higgins & Nicol, 2002).

Links have also been made between outdoor learning (Knight, 2018; Leather, 2018; O'Brien & Murray, 2007; Seyfried, 2002), experiential learning (Roberts, 2006) and the constructivist movement. Constructivist pedagogy is based on the recognition that there are no objective realities and that we each differ in our constructions of the world (Seyfried, 2002). Thus, learners construct meaning from their individual realities which develops their knowledge. The constructivist approach, it is argued, promotes experimentation and problem solving, which can be achieved through outdoor learning experiences (Seyfried, 2002). This suggests that FSLs should provide children with appropriate opportunities to discover their own learning (Leather, 2012).

Outdoor learning experiences afford children and young people the opportunity to engage in social interactions with peers and school staff (Southall, 2014). Vygotsky's social development theory emphasised the importance of social interaction in learning and development (Vygotsky, 1978), suggesting that a child's self-regulated learning is first learnt within the social context (Flynn, 2005). Another theoretical component of Vygotsky's work is the concept of mediation, whereby a psychological tool or sign (Daniels, 2005; Flynn, 2005) can support a child in achieving a goal (Flynn, 2005). Vygotsky considered language as a tool for conveying social understanding which also influences individual understanding.

Another theoretical contribution of Vygotsky is the suggestion that children's learning occurs in their zone of proximal development (ZPD); the distance between a child's abilities/skills when performing independently and their

abilities/skills when supported by more knowledgeable others (Vygotsky, 1978). The term 'scaffolding' (Wood, Bruner & Ross, 1976), which relates to the appropriate level of support given to promote learning, is linked to Vygotsky's theory, particularly in providing support within the ZPD. The interactions that occur within outdoor environments may provide children with the opportunity to learn within their ZPD.

2.5 Research into Outdoor Learning

It has been suggested that learning outdoors can present children with developmental benefits (Maynard & Waters, 2007). In the outdoor environment, children can explore themselves in a unique way to the classroom environment (Maynard, 2007).

Dillon et al. (2005) undertook an action research project with the aim of extending the evidence base for outdoor education. They focused on the process, planning, impact, and evaluation of outdoor learning and explored these in relation to three outdoor environments: school grounds/gardens; farms/city farms; and nature centres. The researchers identified case studies of effective practice and observed students and teachers in the various locations. The learning and outcomes that occurred for the children involved included cognitive outcomes, such as increased knowledge and understanding; affective outcomes, such as enhanced personal development; social/interpersonal outcomes, such as increased confidence and social interaction; and positive physical/behavioural outcomes. The benefits were not limited to the children though, with teachers noting improved relationships with students, personal development in their teaching and curriculum benefits.

Fiennes et al. (2015) also completed a review of the existing evidence base considering the effects of outdoor learning. They identified 58 primary UK studies exploring a range of outdoor learning, ranging from expeditions to Scouts. Some of these were systematic reviews and some were evaluations of Forest School (e.g.

O'Brien, 2009; Slade, Lowery, & Bland, 2013). A range of positive outcomes were noted from the literature, such as respect for self/others, confidence, social skills, resilience and sense of belonging. The most common outcomes were identified as communication and teamwork, improved health and well-being and increased self-esteem.

It could be suggested that teachers are missing opportunities to engage children in effective learning outside (Maynard & Waters, 2007). Maynard and Waters (2007) documented the views of school staff from four schools on the potential of the outdoor environment and also recorded teachers' current practice. Although the outdoor environment was utilised, the teachers would only go outside in good weather and used the same teacher-directed tasks/approaches as used indoors. Maynard and Waters (2007) reported this to be due to practical difficulties with the outdoor space, a lack of understanding of the potential benefits, cultural resistance, concerns of risks and education policies. Davies and Hamilton (2016) noted that a further issue may be the stereotypical, homogenous assumptions held by practitioners in regards to who will benefit from an outdoor classroom. In their study, practitioners considered outdoor learning to be more beneficial for boys, children with additional learning needs and children living in socio-economically deprived areas. This could be because practitioners hold low expectations for some groups of learners and see the outdoor classroom as less academically challenging, rather than recognising the rich outdoor opportunities that can be given to all children (Bradbury, 2014).

2.6 Outdoor Learning in Scandinavia

In Scandinavia it is common practice to engage in educational activities in the outdoors (Bentsen & Jensen, 2012). From a young age, many children in Denmark have the opportunity to engage in frequent use of the outdoor environment through 'Skovbornehave' (Forest Kindergarten) (Southall, 2014). '*Udeskole*' is the term used in Denmark, to describe the regular outdoor education practices

(Barfod, Ejbye-Ernst, Mygind, & Bentsen, 2016) whereby children engage in weekly or fortnightly sessions in natural settings, making use of the local environment to study curriculum areas (Bentsen, Jensen, Mygind, & Randrup, 2010). It is argued that Scandinavian approaches to outdoor learning are different to English methods, as they are based on greater teacher autonomy and principles of 'educating for life', as opposed to being led by government-defined standards and assessments (Rea & Waite, 2009).

A National population survey of 2082 Danish schools indicated that 28% of the responding schools practised *Udeskole*, with another 15% planning to implement it within three years (Bentsen et al., 2010). Although *Udeskole* was already widely used in Denmark, in recent years the number of schools practising *Udeskole* has increased, perhaps due to the introduction of an educational act (Barfod et al., 2016). This is not surprising given that the *Udeskole* related literature suggests it can increase physical activity, higher levels of well-being and improved social relations in children (Bentsen et al., 2010).

2.7 Forest School in the UK

The concept of Forest School was introduced to Britain in 1993 after staff from Bridgwater College embarked on an exchange visit to Denmark and were inspired by the significance the Danish schools give to outdoor activities (Bridgwater College, 2017). Upon returning from their visit, the first Forest School was set up as an adaptation of the outdoor early years practices adopted there (Maynard, 2007; O'Brien, 2009). Cree and McCree (2012) suggest that the seed planted by Bridgwater College grows on centuries-old soil, with British traditions of taking children to natural places dating back to at least the Nineteenth Century. The notion of Forest School was well received by educators, particularly those working in the early years, perhaps due to frustrations in relation to the national curriculum (Cree & McCree, 2013). In 1995, Bridgwater College developed a BTech (Bachelor of Technology) in Forest School, which was soon to be offered throughout Britain

(Forest School Association; FSA, 2017a). Increasingly, authorities throughout Britain began to develop and deliver training in Forest School. In 2002 the first national conference was held and a definition of Forest School within the UK was formulated: “an inspirational process that offers children, young people and adults regular opportunities to achieve, develop confidence and self-esteem through hands-on learning experiences in a local woodland environment” (Forest School Association: FSA, 2017a, “History of Forest School”, para. 5).

Forest School is becoming more established within current educational practices and the number of schools in Great Britain utilising Forest School is expanding (O'Brien 2009). In 2013, Cree and McCree noted that there was at least one Forest School setting in almost every county, an estimated 10,000 trained practitioners and 36 Forest School training providers. This interest in Forest School is perhaps due to the concern that children’s outdoor play has been declining and it is “a useful framework to counteract the ‘cotton wool’ culture” as suggested by Cree & McCree (2013, p. 33). Although originally developed for children during their early years (Shields, 2010), Forest School is now being utilised with older groups of children (Harris, 2015).

Forest School promotes a child-led approach to education, through frequent learning in an outdoor woodland area. Massey (2005) notes that a fundamental difference between Forest School and many other outdoor education approaches is that Forest School is led by the child’s interests, following a framework and supported by qualified practitioners. Forest School requires children to attend the sessions regularly during the term or year with the aim of increasing their confidence through the undertaking of achievable tasks (Shields, 2010). The programme is unique in that it provides children with the skills to undertake activities, however, once these skills are developed, children have the opportunity to take part in self-initiated activities (FSA, 2017b), such as den building, fire lighting and nature craft (Harris, 2015).

In 2012 the Forest School Association (FSA) were formed as a national professional body for Forest School. The aim of this was to clarify Forest School standards, provide professional identity and promote the entitlement to Forest School for all children (Cree & McCree, 2013). The FSA promote themselves as a "UK wide voice for Forest School, promoting best practice, cohesion and quality Forest School for all" (FSA, 2018, "What is the Forest School Association?", para. 1). They define Forest School as:

> *"Forest School is 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 is a specialised learning approach that sits within and compliments the wider context of outdoor and woodland education".* (FSA, 2017b, "What is Forest School?", para. 1)

Forest School is sometimes used by educators as a label for any form of outdoor learning, when in fact it is not (Cree & McCree, 2013). The FSA have a set of principles and criteria for good Forest School practice:

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 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 those 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.

(FSA, 2017c)

Knight (2018) notes that "these principles are wide enough to encompass an extensive range of practices that can be called Forest School; Forest School is rightly celebrated by the FSA as a broad church" (p. 21).

2.7.1 A Critique of Forest School in the UK

There is not one 'model' of Forest School within the UK, schools can utilise a range of training providers that offer varying forms of training (Leather, 2018). The Forest School lead practitioner award is regarded as the equivalent of an academic A-Level (Knight, 2018). The course at the Bridgwater College was developed to be provided along with their nursery training courses. However, more training providers, who are not attached to academic institutions, are now delivering the Forest School training (Knight, 2018). This does raise questions regarding the consistency of training, and thus the practices of Forest School that follow. A system of quality assurance is to be established by the FSA (Knight, 2018), however, as the FSA is a membership rather than a required governing body, it is unclear how this will influence the consistency of practices. The current range of practice makes research of Forest School difficult to generalise. Knight (2018) also noted that sometimes research does not clearly indicate it is examining Forest School, even when it is, and that some research may be claiming to be investigating Forest School without questioning its fidelity. This adds complexity to an already challenging research area.

Leather (2018) argues that there are some issues associated with the implementation of Forest School in the UK. Forest School developed from the Scandinavian philosophy of freedom with nature and spiritual connectedness with the land. In education settings, this supports experiential learning by "being and learning with the land" (p. 3). However, Leather (2018) argues that although

practitioners are well-trained to deliver Forest School activities, the underpinning philosophy is not clearly understood, thus, Forest School is a social construction. Leather (2018) also suggests that Forest School in the UK has become commodified and raises concerns that due to the market dominance of Forest School, stakeholders may perceive it as the only form of outdoor education. Leather (2018) also noted that this commodification of Forest School has resulted in the tendency to state the benefits and efficacy of Forest School for children, such as increased confidence and self-esteem, that "overreach the available evidence" (p. 6).

2.8 Forest School Research in the UK

2.8.1 Early Years

It is important to consider the aims and purpose of Forest School for children in their early years, particularly as Forest School is based on the early years practices employed in Scandinavia (Maynard, 2007; O'Brien, 2009) and as it was developed for this age range in particular (Cree & McCree, 2013). Maynard (2007) utilised data provided on the Bridgwater College Forest School website and interviewed three FSLs (trained through Bridgwater college) to evaluate the key aims, approach and ethos of Forest School specifically for children aged 3-4.

The practitioners indicated that the development of children's self-esteem, self-confidence and independence skills were the main aims of Forest School. Learning about the environment was also seen as an important aim of Forest School; fostering in children an appreciation, care and respect for their environment. In relation to the approach of Forest School, practitioners emphasised the importance of allowing the children to play freely and giving them small achievable tasks that become more challenging. Further to this, allowing children to take risks provides them the opportunity to develop self-confidence. Reference was also made to the practical approach taken at Forest School and the kinaesthetic

learning approach which engages all the senses and allows children to construct meaning from real life applications.

Mackinder (2015) utilised a qualitative case study approach to explore how Forest School sessions are planned for nursery children by practitioners. The study included observations of one child during two different sessions, with two different practitioners (one Forest School trained), followed by semi-structured interviews with the practitioners. This led to the mapping of the child's movements over the two sessions and the completion of the Leuven Involvement and Participation Scale (Laevers, 1997). The purpose was to analyse the involvement of the child in the sessions in relation to the participation of the practitioners. It should be noted that the Leuven scale is based on individuals' interpretation and could be argued as being subjective.

The data indicated that planning is linked to the practitioner's training and the employment of Forest School. The Forest School trained practitioner ensured careful planning and preparation, allowing her to engage, observe and participate more effectively. The child was able to experiment and scored highly on participation and involvement in this session. The non-Forest School trained practitioner displayed more dominating and authoritative behaviours. Rules were applied which did not allow the child to experiment, resulting in less participation and involvement from the child, thus, losing the important 'child-led' focus of Forest School. It was reported that training in Forest School pedagogy was important for all the adults participating in the session.

The research by Mackinder (2015) is limited in its generalisability, as the research was undertaken on a small scale and the outcome categories were pre-determined. Despite these weaknesses, the research does indicate that Forest School offers more than just learning outdoors and suggests there is something in understanding the pedagogy and purpose of Forest School that enables practitioners to implement it effectively.

In another interesting piece of research, Massey (2005) undertook a small-scale study of Forest School with eight children aged 3-4 years, attending an independent nursery. The case study involved structured observations of the children at Forest School, with additional data being collected through video recordings, questionnaires and interviews with children, staff and parents. Changes in relation to children's skills and developments were considered and positive impacts were found in a number of areas. Forest School was reported to be beneficial to the children's development, particularly in the areas of personal, social and emotional development; and language and communication. All the children experienced success and heightened self-esteem and developed new relationships with peers and adults. Practitioners indicated that children had gained confidence in trying new experiences in the outdoor space, which impacted on their confidence in self-initiating tasks.

Massey (2005) concluded that the Forest School provided opportunities for the children to develop their vocabulary and language use and led to them becoming more motivated to use meaningful language in real contexts. Their questioning, it was reported, became more specific over time, moving from "look at this!" type interactions to questions such as, "Where do they live? What do they eat?" (Massey, 2005, p. 30). Affording children the opportunity to self-initiate activities reportedly allowed the children to consider risk-taking. Various aspects of the Forest School structure were also highlighted as important by Massey (2005): the child-led approach; the opportunity to succeed through taking small achievable steps; the access to problem solving tasks; and the opportunities within the programme to develop social skills. However, the study lacks clarity in regards to the methodological procedures utilised. Thus, it is difficult to consider replicating the research, which would be beneficial with an increased sample size and more objective analysis methods.

A more focussed approach was taken by Richardson and Murray (2017), who considered the impact of outdoor learning on children's speech and language (SL). The small-scale case study captured data related to four children, aged 4-5 years,

receiving education in the natural environment (at Forest School) and in indoor and outdoor classrooms. These classrooms mirrored each other in curriculum-based activities. The reporting of the study makes it unclear how the Forest School was implemented or whether any fidelity checks were undertaken, generating some level of apprehension in relating the results to Forest School. Nonetheless, the research offers some interesting conclusions. It was concluded that the children's quality of speech was different depending on the environment they were in: "children's experiences in natural outdoor environments affect the quality of their SL more positively than their experiences in indoor or outdoor classrooms" (p. 465). It was suggested that this was due to the natural environment (Forest school) allowing the children to be more deeply involved in open-ended play and child-initiated activities, as there were fewer boundaries. The use of exclamation suggested the children were excited and enjoying their surroundings, which Richardson and Murray (2017) proposed indicates the impact of Forest School on the children's expressive language. Also, the natural environment provided smaller groups, encouraging social interaction and an enhanced sensory experience, as suggested by the children's adjective use.

2.8.2 Primary

There is an increasing evidence base around Forest School for primary-aged children, with questions being raised about how best to research 'impact' in such a practically challenging area (Harris, 2015). The majority of research takes a broad approach, considering all possible outcomes for young children (e.g. Harris, 2015; Hughes, 2007; Murray, 2003; O'Brien & Murray, 2005) and indicates a range of benefits including social and emotional factors, personal development, learning, access to nature and risk taking. Some, however, have taken a more focused approach, finding that Forest School has positive impacts in relation to play behaviours (Ridgers et al., 2012), perceptions of risk (Savery et al., 2016) and significant behavioural effects in children with poor behaviour (Roe & Aspinall, 2011).

One of the first studies on Forest School within the UK was undertaken by O'Brien and Murray (2005), evaluating Forest School for twenty-four children, aged 3-9 years. A three-stage action research process was used, with the first stage consisting of a workshop for practitioners to consider the impact of Forest School on the children that take part. The practitioners then observed the children at Forest School. These were recorded using self-appraisal templates, developed in the initial workshop. The final stage involved a reflective workshop whereby the practitioners discussed the data they had collected and reflected on the key learning points.

The study concluded that there were a range of positive developments observed in the children, including confidence, motivation and concentration, language and communication and physical skills. These changes in child outcomes were over an extended period, therefore it was recommended that children need regular contact with the natural environment. Although the research illuminated a number of positive outcomes for children as a result of Forest School, the reliability of the data is uncertain, given that the practitioners that worked with the children collected the observational data. Thus, they may have been too closely linked to the children and the Forest School to be completely objective. As with a lot of the research undertaken on Forest School, this research was undertaken through the 'Forestry Commission' and 'Forest Research' (O'Brien & Murray, 2005; O'Brien & Murray, 2006; O'Brien & Murray, 2007; O'Brien, 2009), in which one might argue vested interests could have an influence.

Another study undertaken through a UK Forestry Commission was by Hughes (2007), an education consultant with the Welsh Forestry Commission. The research aimed to illuminate any changes in children engaging in a 14-week Forest School programme and to test evaluation methods. Hughes (2007) used storyboards, observations, diary recordings and review workshops to collect and analyse the data, concluding that changes had occurred in the following ways:

- increased self-esteem and self-confidence;
- improved social skills;

- the development of language and communication skills;
- improved physical motor skills;
- improved motivation and concentration; and
- increased knowledge and understanding of the environment

A recent study (McCree, Cutting, & Sherwin, 2018) utilised a longitudinal mixed methods approach tracking 11 children over three years. The researchers engaged stakeholders, the school and the funding educational charity in identifying desired outcomes of the project, which considered nature connection, emotional well-being and academic development in relation to Forest School. The children in the study were aged 5-7 on entry and 7-10 on exit. The children were chosen by the Head Teacher as they were 'struggling to thrive', some of whom were economically and emotionally disadvantaged. All had additional support in school and their home lives all had some element of disruption. The range of perspectives and avenues for data collection is commendable, as perspectives were gained through the use of interviews, regular session evaluations, semi-structured focus groups and baseline and post-project questionnaires, from children themselves, staff and parents. It was highlighted that parents were difficult to engage, with low questionnaire response rate. There are various methodological limitations, which are discussed in the systematic evidence synthesis review (See Section 2.9), leading to tentative consideration of the outcomes.

It was reported that the project group children indicated high levels of well-being, involvement and engagement throughout the project. Although, it is difficult to ascertain whether this is of significance, as there is no comparative data of when the children were not at Forest School. It was also concluded that Forest School strengthened the children's connection to nature compared to the 'control' groups. However, the data was not subjected to any form of rigorous statistical analysis.

The qualitative data was thematically analysed using grounded theory and provides interesting results. A number of themes were identified through

triangulation of the various data sources (See Table 2.1). The last theme led to a particularly noteworthy point being made: “the school staff present on the sessions rated the children higher overall than the teachers who saw the children solely in school” (p. 12). This difference in perceptions is interesting, as staff that observed the children in the sessions developed ‘new perspectives’.

Table 2.1: Themes identified in research by McCree et al. (2018)

Theme	Key Conclusions
Establishing self-regulation and resilience through emotional space	Children and staff regarded this the most constructive contribution to the children’s well-being
	Children achieved greater self-regulation and resilience
	Children found ways to self-regulate within the sessions
Nurture	Creating strong relationships with a skilled practitioner was a foundation for the children to feel nurtured and thrive
Physical adventure	Children increased their ‘roaming’ around the space
	Confidence of ownership of the space increased
Free social play	“Social interactions affected each experience and its learning potential strongly” (p. 9)
	Children had a strong preference for activities with friends
Nature discovery	Investigating nature outside the Forest School and taking things home was popular
Socially confident learners	Children’s confidence improved
Choice and independence	The children often chose free play
	The child-led element led to a culture of self-directed learning
Whole school culture change	“There was a significant and considerable culture change within the school, with outdoor learning embraced and championed” (p. 11)
Wild experts	Children were encouraged to share their knowledge and skills with others
Behaviour perceptions	Some staff were surprised by the children’s behaviour at Forest School compared with at school
New Perspectives	When new perspectives of the children were shared by parents and staff it had an impact on how the children were viewed
Well-being visible in school	Improved well-being (based on teacher questionnaire data) in school for six out of eleven children

2.8.3 Practitioner Perspectives

Harris (2015) noted the limitations of previous research that had relied upon case by case and exploratory data with limited participant numbers, but also recognised the difficulties in employing more experimental methods. In light of these difficulties, it was suggested that practitioners working directly with children were best placed to provide data. Thus, the perspectives of 20 practitioners who had supported Forest School for over 40 sessions each were gained.

One of the main areas of learning through Forest School was identified as 'personal, social and emotional development', including team work, social skill, coping with challenge and developing resilience. The practitioners also indicated that the children developed knowledge about themselves, which can be transferred to the classroom. This self-awareness was reportedly achieved through learning about their emotional capabilities and how to co-operate with others. It was viewed that Forest School allows children to take risks and take part in peer-led learning as opposed to teacher-led learning, and that the children developed skills, such as language and communication skills. The practitioners suggested that various learning styles can be accommodated at Forest School, as there is access to sensory stimulation and Forest School can be tailored for children of all abilities. The research by Harris (2015) is welcomed as a distinct contribution to the evidence base around Forest School and utilises a relatively large sample size compared to previous research. However, the exploratory methodology used raises questions regarding validity and there still remains a lack of experimental research within this area.

2.8.4 Special Educational Needs

Although it has been argued that practitioners should recognise the importance of outdoor learning for all children (Bradbury, 2014) rather than certain groups of learners (Davis & Hamilton, 2016), research has been undertaken which

specifically considers the impact of Forest School for children with special educational needs (SEN).

A unique contribution to the evidence base was offered by Southall (2014), where a realistic evaluation approach was used to evaluate Forest School for adolescents aged 14-16 with SEN. Features of Forest School, change mechanisms and outcomes were taken from the literature base to form a set of hypotheses, which were then tested through a case study approach. Southall (2014) utilised thematic analysis and applied it to the data generated through observations, interviews, questionnaires and documentary evidence. A programme specification was developed, and the participants reviewed this in a realistic interview. The findings suggested that Forest School supports SEN children's confidence, social skills, language and communication, motivation and concentration, physical skills, knowledge and understanding, emotional well-being and behaviour. The study contributed an innovative methodological approach to the literature, however, realistic evaluation requires judgements to be made, thus the analysis is highly subjective, which is likely to have an impact on the validity of the findings.

More recently, Bradley and Male (2017) explored the views of four children with Autism Spectrum Disorders (ASD) aged 6-8 years, regarding their Forest School experience. A comparative thematic analysis identified three themes from the children: friends; challenge and risk taking; and learning outcomes. Similarly, the mothers of the children and their teaching assistants also highlighted challenge and risk-taking as fundamental components of the children's Forest School experiences. Some of the data presented in relation to children's response appears to be interpretive and perhaps directed. Generalisation of the findings should be tentative and further research on a larger scale should be undertaken in order to do so.

Considering the research discussed, it could be argued that the outcomes of Forest School for these groups of children are similar if not the same as those for children without a diagnosis of SEN.

2.8.5 Summary of Forest School Research in the UK

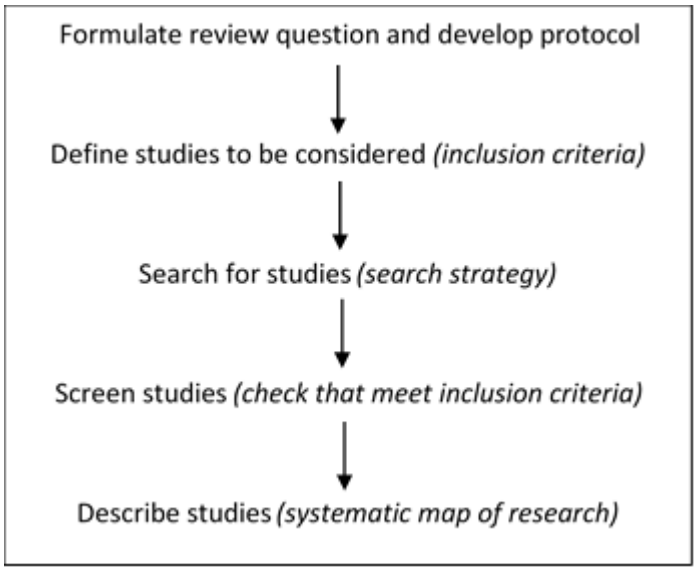
As noted earlier, Forest school is different from other aspects of the UK curriculum due to the child-led nature of it. The adults involved within Forest School act as facilitators rather than teachers, with the ethos focusing on child-led activities. During these activities, children are given time to persist with tasks and to consider problems without pressure from staff to succeed or move onto further tasks (Southall, 2014). The importance of this was highlighted by Mackinder (2015), in that training in Forest School pedagogy was found to be particularly important for all the adults participating in the session, in order for child participation and involvement.

The existing research suggests that Forest School provides some benefits for children of a range of ages, with a range of needs. Research into Forest School relies heavily on exploratory methods to address research questions, yet a more systematic approach is needed (Slade et al., 2013). Harris (2015) indicated that experimental research methods are practically and logistically challenging due to difficulties in identifying measurable outcomes and through using pre- and post-tests with young children.

2.9 Systematic Evidence Synthesis Review

A systematic synthesis is a processes which brings evidence on a particular topic together to develop an understanding of what is known already (Gough 2007). This requires drawing conclusions about the quality and significance of the research (Gough, 2007). Gough (2007) provides a staged approach to undertaking a synthesis, which has provided a structure for the review (See Figure 2.2).

(i) Systematic map of research activity



(ii) Systematic synthesis of research evidence

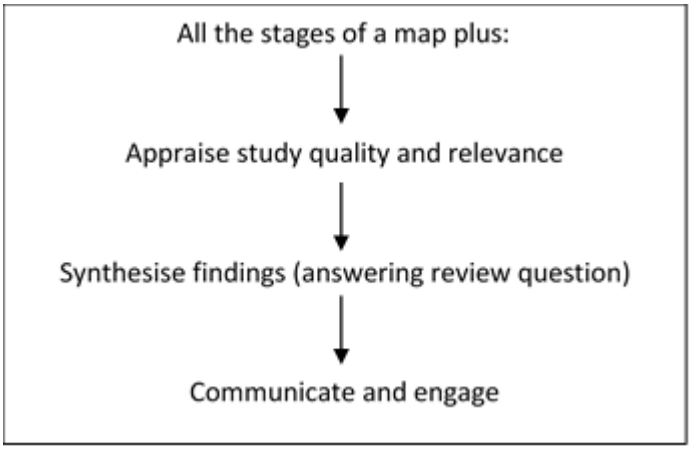


Figure 2.2: Stages of review (Gough, 2007)

2.9.1 Structure of Review

The review begins by providing the research question and the methodology used in identifying the included studies. The quantitative studies and qualitative studies are then reviewed separately using different methods.

2.9.2 Current Systematic Review Methodology

Review Question: What are the outcomes of Forest School for early years and primary aged children, based on information gained from previous research?

2.9.2(i) Criteria for Considering Studies for the Current Review

The table below considers the inclusion criteria for studies to be included in the current review.

Table 2.2: Inclusion criteria for studies to be included in the systematic evidence synthesis review

	Criteria	**Rationale/Comment**
Studies	Peer-reviewed and published	To ensure the studies have been subjected to the critical review of peer scrutiny
	Any methodology	To gain a comprehensive understanding of the existing evidence relating to the impact of Forest School.
	Conducted in UK and available in English	The UK Forest School intervention is different to outdoor learning practices in other countries. Other forms of outdoor learning were not included, as this may have increased the influence of cultural factors.
Participants	Any e.g. parents, practitioners, children (excluding children with a diagnosis of SEN)	To provide studies for review which were relevant to the current research. Data generated from participants needed to relate to 'impact' and the possible 'outcomes' for pre-school and school age children
Intervention	Evaluation of 'Forest School'	The researcher was unable to evaluate the fidelity of the interventions due to varying levels of detail in each study. It was assumed that if a study identified as evaluating Forest School, the researchers had taken measures to ensure it was Forest School. It should be taken into account that this may not always be the case (Knight, 2018).

2.9.2(ii)Study Appraisal

The 'weight of evidence' framework (Gough, 2007) was utilised in evaluating the quality of the studies included in this review. This was applied using the specifications in figure 2.3.

Weight of Evidence Criteria	Implications for this review
A – quality of the evidence	Generic and non review-specific judgement about the coherence and integrity of the evidence in its own terms. That may be the generally accepted criteria for evaluating the quality of this type of evidence by those who generally use and produce it.
B – appropriateness of the evidence	Review-specific judgement about the appropriateness of that form of evidence for answering the review question, that is the fitness for purpose of that form of evidence. For example, the relevance of certain research designs.
C – relevance to research question	Review-specific judgement about the relevance of the focus of the evidence for the review question. For example, the type of sample, the type of evidence gathering or analysis.
D – overall judgement	Overall assessment of the extent that a study contributes evidence to answering a review question.

Figure 2.3: Weight of evidence criteria (Gough, 2007)

The studies vary considerably in terms of their weight of evidence. It was decided that studies of all standards would be included the current review as there were limited numbers of peer-reviewed research.

2.9.2(iii) Search Strategy

PsycINFO, ERIC, Science Direct and Web of Science databases were electronically searched for articles published between 2007 and 2018. The key search term 'Forest School' was used (the full search process can be seen in Appendix 1). A filter had to be applied to the Science Direct search, with only 'Abstract, title and

Key words' searched. This was due to there being over 750 results generated without this filter.

A total of seventy-five journal articles were identified from electronic databases. After duplicates were removed, fifty-four studies remained. Titles and abstracts were examined against the inclusion criteria; thirty-three were removed as they were not related to Forest School and/or were not UK studies, one was removed as the participants had a diagnosis of Autism Spectrum Disorder (ASD), and twelve were removed as they did not assess child outcomes. The eight remaining studies included two papers which were reporting the same set of studies (O'Brien & Murray 2007; O'Brien, 2009), therefore these studies were combined in the review, resulting in seven studies to be reviewed. A hand search of the references from these studies was undertaken, as was a search of three relevant Journals: Educational Psychology in Practice; Early Child Development and Care; and Journal of Adventure Education and Outdoor Learning. This generated two further studies to be included (McCree et al., 2018; Richardson & Murray, 2017). Table 2.3 provides details on all nine studies.

Six of the studies utilised qualitative methods and one used quantitative methods. Two of the studies utilised mixed methods (McCree et al., 2018; Turtle, Convery, & Convery, 2015) and were reviewed in both the qualitative and quantitative review, with each element reviewed separately.

2.9.2(iv) Rationale for Search Terms

The term Forest School is specific to the UK (as described in Section 2.9), therefore it was deemed appropriate to search for this term. There was consideration of whether to search for further terms, such as 'outdoor education' and *Udeskole*'. However, after an initial search it was clear that this generated studies from an extremely broad research area. It was decided that there would be no other search terms or filters used as to ensure an exhaustive search of the available research on Forest School.

Table 2.3: Studies included in the systematic synthesis evidence review (combination of studies included in the quantitative and qualitative reviews)

Author, publication date	Participants	Purpose	Intervention Frequency
Harris (2017)	FSLs (N=20)	To explore FSLs views on children's learning during forest school	FSLs had each been involved in forest school for 40+ sessions
McCree et al. (2018)	Children (N=11), aged 5-7 at the beginning of the study and 7-10 at the close of the study 'Semi-control' group from wider school population (N=95) and national data (1200) Teaching team, project practitioners, Parents (N = not reported)	To investigate the impact of Forest School on children's academic attainment, well-being and connection to nature	Weekly visits for 3 years
O'Brien and Murray (2007)	Children (N=24) from 7 schools, aged 3-9 years. Parents (N=13) Staff/Practitioners (N=not reported)	To consider the impacts of Forest School on children	Approximately 15 sessions over an 8-month period
Richardson and Murray (2017)	Children (N=4) aged 4-5 years.	To compare the quality of children's utterances in different learning environments	Weekly sessions

Ridgers et al. (2012)	Children (N=17, 6 males and 11 females) aged 6-7 years	To examine children's perceptions, knowledge and experiences of play before and after Forest School	12 sessions between March and June 2009; one morning session per week, for 2 hours
Roe and Aspinall (2011)	Young People (N =18, 15 males and 3 females), with an average age of 11 years	To compare the restorative outcomes for adolescents when spending time in Forest School versus a conventional indoor school setting.	1 day
Slade et al. (2013)	Teacher (N=1) Teaching Assistants (N=2) Family and pastoral support officer (N=1) Volunteers (N=2) Head Teacher (N=1) Parents/carers (N=7) Children (N=10), in Year 4 and Reception	To evaluate the impact of Forest School visits for Primary school aged children.	3 sessions
Turtle et al. (2015)	Children (N=195), from Junior and Primary Schools	To investigate the attitudes of children who take part in Forest School towards the natural environment	Not reported
Waters and Begley (2007)	Children (N=2, 1 male and 1 female), aged 4 years and 4 months	To explore the development of positive risk-taking behaviours when engaging in Forest School	Not reported

2.9.3 Quantitative Systematic Review

The following section will consider the weight of evidence of the quantitative studies identified.

2.9.3(i) Studies Included for Critical Analysis

Three studies utilised quantitative methods, one quasi-experimental (Roe & Aspinall, 2011) and two mixed method studies (McCree et al., 2018; Turtle et al., 2015). Details of these can be seen in Table 2.3. The studies found positive outcomes, indicating positive behaviour changes (Roe & Aspinall, 2011), pro-environmental attitudes (Turtle et al., 2015), high levels of well-being and strengthened connection to nature (McCree et al., 2018) for the children taking part in the Forest School. The design, outcomes, limitations and weight of evidence of the three studies are presented in Table 2.4.

Table 2.4: Quantitative studies included in the current review

Author	Outcome Measures	Design	Results (as reported in study)	Limitations	Weight of Evidence
McCree et al. (2018)	<u>Self-report Measures</u> - Connection to Nature Index, 16 items (Cheng & Munroe, 2012) <u>Observations</u> - Leuven Scales for well-being and involvement - engagement measure created by researcher -observations completed weekly by researcher and session leader <u>Government data</u> - Academic levels from school-based assessments - Attendance data	Mixed Methods: Quasi-experimental (tentative given that 'semi-control' groups were used) between-groups design (self-report measure and government data)	High levels of well-being, involvement and engagement observed throughout the project Intervention strengthened the children's connection to nature Positive impact on attainment and attendance for the children engaging in Forest School	Small Sample Size for experimental group 'semi-control' – these were from the school (connection to nature) and national data (attainment and attendance) - they were not matched (the experimental group were chosen because they were economically and emotionally disadvantaged) - no indication of whether these children received Forest School or any similar interventions -only post data compared for connection to nature Engagement measure-validity Data was analysed using comparison of means - no statistical analysis undertaken	Quantitative element: A-Low B-Medium C-Low D-Low

				Causal attributions made which cannot be clearly linked through the data	
Roe and Aspinall (2011)	Self-report Measures -Mood Adjective Checklist (MACL) -6-item personal project scale	Quasi-experimental, repeated measures between-groups design	Forest Schools advantageous for both behaviour groups (good and poor) on the four emotional variables (energy, hedonic, tone, stress and anger), reversing outcomes in the poor behaviour group. No significant change indicated for personal goals. Although a positive trend was evident.	Small Sample Size Both groups (poor and good behaviour) partook in both conditions (Forest School and conventional school setting) at the same time	A-Low B-Low C-Medium D-Low
Turtle et al. (2015)	Self-report Measure -Questionnaire to measure environmental attitudes (Musser & Malkus, 1994)	Mixed Methods: quasi-experimental, between-groups design	The highest pro-environmental attitude score was from one of the Forest Schools The second highest scores were generated from a non-Forest School. When grouped into Forest Schools and non-Forest Schools analysis indicated there was a significant difference between the schools, with those who have taken part in Forest School displaying a more pro-environmental attitude.	Analysis – use of only t-tests. Sample not evenly distributed Questionnaire Measure - validity	Quantitative element: A-Medium B-Low C-Low D-Low

2.9.3(ii) Participant Details

The participants in the reviewed studies were children from England (McCree et a., 2018; Roe & Aspinall, 2011) and Scotland (Turtle et al., 2015). Roe and Aspinall (2011) included 18 children identified by school staff as having 'poor' (N=12) and 'good' (N=6) behaviour. A limited sample size can result in a lack of power to detect statistical significance and can impact on the generalisability of the data. The age of participants in the study by Roe and Aspinall (2011) is reported as an average age of 11 years. The participants (N=195) ranged in age from 8 to 11 years old in the study by Turtle et al. (2015). The 11 children that completed Forest School in the study by McCree et al. (2018) were chosen by the Head Teacher as they were 'struggling to thrive'. As it was a longitudinal study, the children were aged 5-7 on entry and 7-10 on exit.

Participants were sought from schools that participate in Forest School, through a training website (Turtle et al., 2015) and through the Forest School organisation (Roe & Aspinall, 2011). Turtle et al. (2015) also included schools which were 'non-Forest Schools' to generate a comparison group (N=136); the sample was more heavily distributed to this group.

2.9.3(iii) Intervention Implementation

One of the studies (Turtle et al., 2015) failed to report the children's engagement with Forest School, for example, how long or how often they attended. Roe & Aspinall, (2011) evaluated children's behaviour after one day at Forest School. McCree et al. (2018) noted that the children engaged in weekly sessions based on a 'Forest School model', over a three-year period. Although some of the activities reported appear to reflect activities utilised in Forest School, it is unclear how closely related to Forest School the sessions were.

Turtle et al. (2015) used three Forest Schools and provided a plan of activities for a Forest School day for only one of these schools. Roe and Aspinall (2011) do not

provide a description of the Forest School. Research evaluating Forest School is already very limited in its generalisability, as FSLs are trained differently and have the freedom to implement different practices. The generalisability is decreased further by not having information on the Forest School under investigation.

2.9.3(iv) Study Design

The studies included in the current review utilised a quasi-experimental design, where a control or comparison group was included. Roe and Aspinall (2011) compared the restorative outcomes, in terms of pupils' mood and reflection on personal development, for young people when spending time in Forest School versus a school setting. The pre-data was collected at school and the post-data was taken at the end of the day after Forest School. Both the groups (poor and good behaviour) partook in both conditions (Forest School and conventional school setting) at the same time, which has implications for the validity of the effects. Turtle et al. (2015) compared the environmental attitudes of children that had taken part in Forest School with children that had not.

McCree et al. (2018) considered participants' connection to nature at the end of the project. No pre-intervention data was collected, which makes it difficult to attribute scores to the Forest School. 'Semi-control' group data for connection to nature and attendance was drawn from the wider school (N=96). Data on attainment was generated from school assessments and government national data (N=1200). This was tracked over a one-year period and no data was gained pre-intervention. The comparison of the data with these groups is a limitation of this research (See Table 2.4). The observations for well-being, involvement and engagement were completed weekly at each Forest School session, by the session leader and researcher.

2.9.3(v) Outcome Measure

Roe and Aspinall (2011) utilised a short version of the MACL (Mathews, Jones, & Chamberlain, 1990) and a 6-item personal project scale to measure efficacy, control, support, self-identity, enjoyment and stress. This scale was developed by the researchers based on an original framework. It is reported that both measures used are valid, with test-retest reliability. However, the measures did not directly measure behaviour, thus the implications drawn regarding the restorative effect of Forest School on behaviour should be met with caution.

Turtle et al. (2015) measured the environmental attitudes of children based on an adapted self-report questionnaire (Musser & Malkus, 1994). There is no reference to the validity or reliability of this measure. Furthermore, in each school, the children were supported in filling in the questionnaire by their teacher. The teachers were given instructions on how to administer it, however, it is still likely that differences in the support given during data collection may have influenced the reliability of the results. As the studies relied on self-report measures, social desirability and participant bias may have influenced the data provided, subsequently compromising the external validity of findings (Robson, 2011).

McCree et al. (2018) used the Connection to Nature Index. It is noted that the questionnaire was recently field-tested, however no reference is made to the validity or reliability of the measure. The assessment and attendance data were gained through school data and national government data. The researcher had no control over the conditions of these assessments. The Leuven Scales were used to measure well-being and involvement, which have been used in other educational research (McCree et al., 2018). The engagement measure was developed 'in-house' and cannot be scrutinised further as the measure is not provided to the reader.

2.9.3(vi) Analysis and Results

Roe and Aspinall (2011) utilised an analysis of variance (ANOVA) approach to analysis, subsequently concluding that Forest School improved all pupils' mood and reflection on personal goals more so than the school setting. The Forest School reversed negative outcomes for children in the poor behaviour group. In a smaller sample (N=10) exploring personal goals, the ANOVA did not indicate a significant change. The small sample size may have resulted in a lack of power to detect statistical significance.

In the second study, (Turtle et al., 2015) T-tests were used to analyse the data. The highest pro-environmental attitude scores were found in participants attending one of the Forest Schools. Interestingly, two non-Forest Schools scored higher on pro-environmental attitudes than some of the Forest Schools. The grouped data indicated that there was a significant difference, with children having better attitudes towards the environment if they had engaged in Forest School. As only t-tests were used to analyse the data, results should be considered with caution.

McCree et al. (2018) did not utilise any rigorous statistical analysis, instead, analysing the data by comparing means. It was concluded that the children engaging in Forest School scored high levels of well-being, involvement and engagement throughout the project. It was also concluded that Forest School strengthened the children's connection to nature compared to the 'control' groups. It is difficult to ascertain whether these conclusions are of significance, however, as no pre-intervention or comparison data was gained. It was also reported that children in the project group improved in areas of Literacy and Numeracy. However, as the Forest School children were identified as receiving additional support in school, it is difficult to attribute this to the Forest School intervention. Finally, the attendance data showed a 2.4% increase in attendance over the three years for the children engaging in Forest School, compared with the whole school at 1.1%. Again, this is difficult to interpret, as the groups were not matched and the size of the groups were significantly different.

2.9.3(vii) Synthesis of Quantitative Review

The studies considered the restorative impact of Forest School on children with good and poor behaviour (Roe & Aspinall, 2011), the pro-environmental attitudes of children that engage in Forest School (Turtle et al., 2015) and the impact of Forest School on children's academic attainment, well-being and connection to nature (McCree et al., 2018). The studies drew positive conclusions regarding the impact of Forest School. As three very different methods, samples and analysis were employed, it is difficult to review them comparatively. What can be drawn from the review is that the use of quantitative methods in Forest School research is both sparse and low in terms of weight of evidence. It is apparent that undertaking experimental methods in this area is perhaps lacking due to the difficulties and limitations evident in these three studies.

In all the studies there are various confounding variables which could have impacted on the reliability of the data. It does not appear that any of the studies controlled for contextual factors, such as staffing, and no consideration was given to the possibility that various schools may deliver the Forest School intervention differently.

A strength of the studies is the attempt to merge experimental methods within the Forest School literature. In a research area that lacks 'gold standard' research, these attempts allow for limitations and barriers to be highlighted, resulting in future studies, including the current research, to endeavour to address these issues.

2.9.4 Qualitative Systematic Review

The following section will consider the weight of evidence of the qualitative studies identified.

2.9.4(i) Studies Included for Critical Analysis

Eight of the studies identified utilised qualitative methods (Harris, 2015; McCree et al., 2018; O'Brien & Murray, 2007; Richardson & Murray, 2017; Ridgers et al., 2012; Slade et al., 2013; Turtle et al., 2015; Waters & Begley, 2007). Details of these can be seen in Table 2.3. The included studies have been read, summarised and appraised with outcomes shown in Table 2.5.

Table 2.5: Qualitative studies included in the current review

Author	Data Collection Measures	Research Design	Themes and conclusions	Weight of Evidence
Harris (2015)	Individual semi-structured interviews via telephone	Pilot Study Thematic Analysis	1. Personal, Social and Emotional Development (e.g. relationships and self-awareness) 2. Risk and Responsibility 3. Topics (e.g. learning about nature) 4. Styles of Learning (e.g. sensory and peer-led) 5. Connecting with Nature	A - Medium B - Medium C - Medium D - Medium
McCree et al. (2018)	Interviews Session evaluations Semi-structured focus-groups Questionnaires Fieldwork observation	Thematic Analysis	1. Establishing self-regulation and resilience through emotional space 2. Nurture 3. Physical adventure 4. Free social play 5. Nature discovery 6. Socially confident learners 7. Choice and independence 8. Whole school culture change 9. Wild experts 10. Behaviour perceptions 11. New Perspectives 12. Well-being visible in school	Qualitative Element: A - Medium B - Medium C - Low D - Medium
O'Brien and Murray (2007) O'Brien (2009)	Three stages: 1. Storyboard – participative discussion to establish a 'theory of change' and	Participatory action research Thematic Analysis	1. Confidence 2. Social Skills 3. Language and Communication 4. Motivation and Concentration 5. Physical Skills 6. Knowledge and Understanding	A - Medium B - Medium C - Medium D - Medium

	framework of collecting data 2. Data collection and Analysis – descriptive observations, interviews and group session with the children 3. Reflection Poster - participative workshop for stakeholders		7. New Perspectives 8. Ripple Effects beyond Forest School	
Richardson and Murray (2017)	Audio and visual observations – voice recording devices	Case Study Analysis: 1. Thematic Analysis 2. Early Childhood Environment Rating Scale (ECERS) 3. Type/Token Ratios analysis (Five-minute vignettes of children's recorded speech)	• Children's lexical diversity richer in Forest School environment • Excitement and enjoyment was more evident in their language at Forest School • Language reasoning scores lower in the Forest School environment • Verb, adjective and exclamation usage higher at Forest School • Noun usage lower in the Forest School environment for 3 out of 4 children	A - Medium B - Medium C - Medium D - Medium
Ridgers et al. (2012)	Semi- structured focus group discussions at baseline and post-programme	Thematic Analysis - Pen Profiles Verbatim quotations	Pre-Intervention: 1. Fun 2. Games/Activities 3. Interacting with others 4. Play	A - Medium B - Medium C - Medium D - Medium

			Post-Intervention: 1. Fun 2. Games/Activities 3. Interacting with others 4. Play 5. Interaction with environment 6. Imagination 7. Exercise	
Slade et al. (2013)	Interviews	Reporting of perspectives from various samples. No details of data analysis, no thematic presentation of findings	Reporting of perspectives from various samples * No details of data analysis, no thematic presentation of findings	A - Low B - Medium C - Low D - Low
Turtle et al. (2015)	Questionnaires Naturalistic Enquiry	Mixed Methods: quasi-experimental	Only quotes from children provided * No details of data analysis	Qualitative element: A - Low B - Low C - Low D – Low
Waters and Begley (2007)	Naturalistic observations Informal discussions	Exploratory Inductive Approach, Thematic Analysis	Risk-taking behaviours observed in the Forest School environment but not in the school play space Affecting risk taking behaviours: 1. Learning profiles of the children 2. Their response to the different environments 3. Features of the environment * no thematic presentation of findings	A - Low B - Medium C - Low D - Low

2.9.4(ii)Participants Details

The participants within the studies included children (McCree et al., 2018; O'Brien & Murray, 2005; Richardson & Murray, 2017; Ridgers et al., 2012; Slade et al., 2013; Turtle et al., 2015; Waters & Begley, 2007), parents (McCree et al., 2018; Slade et al., 2013) and stakeholders (Harris, 2015; McCree et al., 2018; Slade et al., 2013). The sample sizes and the number of children engaging in Forest School was varied (See Table 2.3). Some participant numbers were relatively high considering the research designs adopted (Harris, 2015; O'Brien & Murray, 2005; Ridgers et al., 2012; Slade et al., 2013).

2.9.4(iii) Intervention Implementation

The experience of Forest School within the studies ranged in frequency and length (See Table 2.3). Some studies clearly reported the amount of Forest School sessions the children participated in (McCree et al., 2018; O'Brian & Murray, 2007; Ridgers et al., 2012; Slade et al., 2013), whereas some did not report this at all (Turtle et al., 2015; Waters & Begley, 2007). Two of the studies (O'Brien and Murray, 2007; Turtle et al., 2015) included an example of one Forest School session from one school. Both these studies recruited multiple schools however, and it is unclear as to how the other schools implemented Forest School. In some of the studies the reporting of the nature of the Forest School implemented was extremely vague (McCree et al., 2018; Richardson & Murray, 2017). Ridgers et al. (2012) provided a brief overview of every session the participants engaged in, which was helpful in understanding the purpose and focus of each session.

2.9.4(iv) Study Design

Two of the studies solely utilised semi-structured interviews in order to gain perceptions related to the outcomes of Forest School (Harris, 2015; Slade et al., 2007). Harris (2015) interviewed FSLs as an independent researcher with no prior relationship to participants, thus increasing the reliability of the interpretation.

O'Brien and Murray (2007) adopted a participatory action research methodology (See Table 2.5). Although a strength of the research is that data were collected from multiple sources (staff, parents and children) the interpretation of data may lack reliability as practitioners themselves, with possible vested interests, completed the observations.

Ridgers et al. (2012) interviewed children in focus groups on their views of nature and play at baseline and post-programme. The interviews were conducted immediately after the Forest School session, which raises questions about the possibility of delayed outcomes.

One study (Waters & Begley, 2007) used naturalistic observations as their main method of data collection. Dictaphones were used and the observations were completed at the same time of day in order to reduce any confounding variables.

Turtle et al. (2015) utilised very basic naturalistic observations, perhaps to illuminate some of the outcomes generated from the quantitative element. It appears as though no explicit data analysis was utilised.

Richardson and Murray (2017) considered whether children's utterances, as part of their speech and language development, were affected by different learning environments (indoor classroom, outdoor classroom and Forest School). Children's utterances were recorded, and the researcher also observed the children. The data were analysed using a range of methods (See Table 2.5).

The research by McCree et al. (2018) was over a three-year period, which is uncommon in the Forest School literature. Children were interviewed every year. Semi-structured focus groups with parents were completed at the beginning, middle and end of the research period and staff focus groups were held termly. Pre and post Forest School questionnaires were completed by children, parents and staff. A strength of this research is the range of qualitative data gained, however, there is little reporting of the exact procedures used.

2.9.4(v)Outcomes

The common areas from each study were identified and collated to create a synthesis of outcome themes[2].

Affective Outcomes

Five of the studies generated themes related to affective outcomes. These included themes around the development of 'self', such as self-confidence (O'Brien & Murray, 2007), which is suggested to come from the children having the freedom and the time to learn and demonstrate their independence (O'Brien & Murray, 2007). The confidence displayed outdoors reportedly empowered children to participate in new activities, for example, den building (Slade et al., 2013).

Self-esteem and self-awareness (Harris, 2015) were also highlighted: "It promotes self-esteem and self-confidence by presenting small and achievable tasks." (Harris, 2015, p. 9). Development of self-regulation and resilience were reported as the children became more confident and the Forest School provided an 'emotional space' for the children to be themselves and express their emotions (McCree et al., 2018). Children's motivation to attend school was reportedly higher on the days in which they were to engage in Forest School (O'Brien & Murray, 2007, Slade et al., 2013) and staff noticed increased motivation exhibited by children, who would typically find it hard to focus, whilst engaging in Forest School (Slade et al., 2013). Improved well-being was noted for some children by teachers (McCree et al., 2018). Turtle, Convery and Convery (2015) concluded that the most successful parts of the Forest School session, in regards to children's engagement and enjoyment, were when they could utilise their senses to explore.

[2] Two of the studies (Slade et al., 2013; Turtle et al., 2015) did not provide details of the data analysis, or thematic analysis. Thus, attempts have been made to generate themes from the research, however, they were deemed low in terms of weight of evidence and their conclusions were not drawn upon as heavily.

Social Development and Relationships

The impact of Forest School on children's social interactions and development of relationships was reported in a number of studies, due to the various activities which encourage children to work as a team, such as den building (O'Brien, 2009). O'Brien and Murray (2007) noted an increased awareness in the children of the consequences of their actions, such as, holding a branch so it does not hit another child (O'Brien, 2009), and the sharing of tools and engaging in co-operative play. School staff have reported observing higher levels of social interaction within the Forest School context and children who would not normally work together were observed collaborating (Slade et al., 2013). Forest School practitioners reported that encouraging children to take turns, negotiate, listen to each other and help each other supported the children to develop empathy and self-regulation, which helped them to engage socially (Harris, 2015). Children showed a strong preference for sharing time and activities with friends (McCree et al., 2018) and described the social impact of Forest School: "at FS I learned to respect everyone else. I really liked the way that we could all join in with everything, and then sometimes we split groups because then we get to meet, we get to play with new people." (Ridgers et al., 2012, p. 63).

Language and Communication

The development of language and communication has been highlighted as an emerging theme in research by Harris (2015) and O'Brien and Murray (2007). Forest School Practitioners reported that the development of relationships improved the children's' communication skills:

> *"One unexpected outcome that has surfaced is language and communication development because obviously there's a very social element to it and children that have struggled in the classroom particularly with language, their language has really, really come on as a result of attending forest school regularly".* (Harris, 2015, p. 279)

O'Brien and Murray (2007) noted the children engaged in more sophisticated uses of both written and verbal language, prompted by engagement in Forest School. However, the theme 'Language and Communication' is discussed very little in terms of how this theme developed and what is meant by the theme.

Richardson and Murray (2017) highlighted the differences in children's language use in Forest School compared to the indoor and outdoor classrooms, reporting that children in Forest School used more verbs, adjectives and exclamations, and their excitement and enjoyment was more evident through their language.

Risk-taking

Waters and Begley (2007) concluded that the Forest School environment was more able to support positive risk-taking behaviours, than the school outdoor space. They suggest that Forest School can help children to develop positive learning attitudes towards physical risk and challenge. This is supported by the research by Ridgers et al. (2012), in which the children themselves indicated that they had started to face their fears, such as a fear of minibeasts. Harris (2015) also noted that Forest School encourages children to identify, assess and address risks, for example when tree climbing.

Learning

All of the studies, except for one (Waters & Begley, 2007) referenced learning as an outcome for children taking part in Forest School. Two parents highlighted the importance of learning about the environment at Forest School (Slade et al., 2013). Children reportedly developed their understanding of safety and routines (Ridgers et al., 2012) and this was transferred into their home environment and discovery play. In one school, the children became 'wild experts' and children were encouraged to share their knowledge with others (McCree et al., 2018).

O'Brien and Murray (2007) reported that children began to learn what plants were called and became concerned with protecting their environment: "she shows lots of interest in plants, trees and animals and their habitat" (O'Brien & Murray, 2007, p. 260). Harris (2015) generated a number of themes related to the learning that occurs through Forest School: nature education; skills and tool use; learning and the national curriculum. Forest School Practitioners indicated that children learnt about nature, but that it was incidental, rather than explicitly taught.

Play

Ridgers et al. (2012) highlighted that the Forest School activities induced imaginative play within the natural environment outside of school. Compared to data gained prior to engaging in Forest School, the children reported a greater range of natural play environments. Slade et al. (2013) noted that one parent reported an impact on her child's play following the sessions, as he was interested in making a den structure.

Physical Skills

Forest School has been shown to provide children with the opportunity to develop their gross motor and fine motor skills (O'Brien & Murray, 2007). Also, some children were aware of the exercise benefits whilst at Forest School (Ridgers et al., 2012).

2.9.4(vi) Summary Of Qualitative Review

The qualitative research appears to evidence the utility and potential of Forest School and the various strengths of the studies. However, it is also important to recognise the methodological weaknesses, for example, only half of the studies provided information on the implementation of the Forest School sessions within their research, thus raising questions on the generalisability of the findings.

The studies differed in their design, participants, pupil age and the implementation of Forest School. However, commonalities were evident, and the qualitative review highlighted some common positive outcome areas: affective outcomes; social skills and relationships; language and communication; learning; risk taking; play; and physical skills.

2.10 Summary of the Literature Review

There are a range of educational practices in the UK which could be considered an outdoor learning approach. However, the use of such approaches appears to be declining due to various concerns and misperceptions of who may benefit from outdoor learning. Although the government has shown some commitment to ensuring such practices increase in English schools, there is a lack of a clear definition of outdoor learning or indication of what such practices may look like in schools and other settings.

Forest School has grown since it was developed in the early 1990's by education staff from Bridgwater College. It is suggested that Forest School is different from other forms of outdoor education approaches, as it promotes a child-led approach to education, follows a framework and is supported by qualified practitioners (Massey, 2005). As Forest School is over an extended period, the children's skills are developed over time, with them later having the opportunity to take part in self-initiated tasks (FSA, 2017b). In 2012 the FSA were formed as a national professional body for Forest School. Membership to the FSA is not compulsory for all practitioners and settings using Forest School, as such, there is no regulatory process to ensure that Forest School is being implemented as intended. The FSA does have a set of six principles which identifies good Forest School practice, encompassing practical considerations and the aims of Forest School. Although these principles have been developed, it is still the case that there is no set model of Forest School and schools can utilise a range of training providers that offer varying forms of training (Leather, 2018). The current range of practice makes

research of Forest School difficult to generalise. It is also argued that the commodification of Forest School is an issue; it has a market dominance which may result in stakeholders viewing it as the only form of outdoor education (Leather, 2018).

Various theoretical underpinnings of outdoor learning are highlighted in the literature. In particular, links have been made to constructivist pedagogy (Knight, 2018; Leather, 2018; O'Brien & Murray, 2007; Seyfried, 2002), which suggests learners construct meaning from their individual realities which develops their knowledge (Seyfried, 2002). This may indicate why previous research on Forest School has typically taken a constructivist epistemology, utilising qualitative methods, and may suggest that capturing the impact of Forest School is difficult without taking into account such individual experiences. Much of the literature on Forest School discusses the child-led nature of the approach, and it is suggested that adults act as facilitators rather than teachers. This links to Vygotsky's theory regarding the ZPD; the distance between a child's abilities/skills when performing independently and their abilities/skills when supported by more knowledgeable others (Vygotsky, 1978). Adults that support Forest School sessions should therefore 'scaffold' the children or young person's learning through providing support in the ZPD. It is not entirely clear in the literature what this 'support' from adults should look like, which links back to the range of training available and a lack of a set model of Forest School.

In reviewing the literature on Forest School, it was evident that there were a range of positive outcomes suggested, for a range of ages. The studies which collected and analysed qualitative data, which was a high proportion, generally overlapped in the outcomes identified. The positive outcomes include affective outcomes, such as increased confidence and self-esteem (Maynard, 2007); social skills and relationships, such as developing new relationships with others (Massey, 2005); language and communication, such as improvements in the children's quality of speech (Richardson & Murray, 2017); learning, such as learning of the environment (Hughes, 2007); risk taking, such as developing positive learning

attitudes towards challenging situations (Waters & Begley, 2007); play, such as increased imaginative play (Ridgers et al., (2012); and physical skills, such as development of gross motor and fine motor skills (O'Brien & Murray, 2007). Although helpful in understanding what the positive outcomes of Forest School may be, in the majority of these studies, there is a lack of in-depth description given to the outcomes identified, making it difficult to consider what these stated outcomes specifically relate to in relation to child development and how they link to the intended aims of Forest School. This allows for readers to individually construct ideas about the outcomes of Forest School, which in fact may not be related to what was actually found in the research.

The systematic review highlighted that there are very few studies on Forest School which have utilised experimental methods, and these are low in their weight of evidence, due to the compromised designs. In particular, there is limited discussion of the validity and reliability of the procedures taken. The existing evidence base is dominated by qualitative research methods, which are perhaps higher in their weight of evidence when considered on an individual basis. However, it was evident across both types of research that there was a lack of consideration of what Forest School is and whether the intervention under investigation was in fact Forest School. Thus, making it difficult to generalise the findings and support the development of the current study design. What was particularly noteworthy is the reliance on one type of research design to promote and highlight the benefits of Forest School. This perhaps strengthens the point made by Leather (2018), that statements are made regarding the benefits and efficacy of Forest School that "overreach the available evidence" (p. 6). Thus, the research aims to consider Forest School on a critical level and will attempt to introduce more rigorous evaluation methods to the evidence base.

2.11 Context of the Current Study

The research, limited as it is in scope and with regard to methodologies employed, can be seen as beginning to offer some evidence as to a positive effect for Forest School. However, to a large degree this growing confidence in Forest School is based on non-experimental qualitative research, or significantly compromised quasi-experimental research. The implementation of Forest School has, though, continued to grow. In 2013, it was reported that there was an estimated 10,000 trained practitioners and 36 Forest School training providers (Cree & McCree, 2013) and Leather (2018) highlighted the growing commodification of Forest School. This is likely to be accompanied by an increasing spend on training and increasing commitment of teaching time. As more research is published, more commitment is being made to Forest School and yet, it remains the case that very little in the way of outcome focused experimental evaluative research has been undertaken.

2.12 Study Aims and Research Questions

The current research aims to contribute to the evidence base of UK Forest School and provide future researchers with the building blocks to begin utilising experimental methods in this area. The aim is to evaluate Forest School in terms of whether it promotes positive outcomes for nursery aged children. Although it could be argued that the age of the children under investigation was chosen due to opportunity, it was regarded as important to consider the impact for nursery aged children, given that Forest School was developed for this age range (Cree & McCree, 2013) and is based on early years practices in Scandinavia (Maynard, 2007; O'Brien, 2009). Furthermore, previous research that highlights a range of benefits for children engaging in Forest school in their early years (See Section 2.8.1) is again limited in experimental methods.

Much of the previous literature has taken a broad approach to evaluating Forest School, allowing for themes to emerge from the data. However, as the current

research aimed to utilise experimental methods, an outcome focussed approach was needed. According to the literature, the chosen outcomes could have included: affective outcomes, such as confidence and self-esteem; social skill development; amount of risk-taking behaviours; physical development, communication and language use; learning about the environment; and behaviour. As the outcomes noted here encompass a wide range of areas, in making decisions about the research focus, the researcher did not want to rely entirely on the literature. Therefore, the views of stakeholders were sought to ascertain the key objectives in the research setting and determine what outcomes might be practically measurable. This process is discussed in detail in the following Chapter. The two overarching research questions were identified:

1. Does participation in Forest School have an impact upon the social and emotional well-being of nursery aged children?
2. Does participation in Forest School have an impact upon the communication skills of nursery aged children?

3 Methodology

3.1 Introduction

The following chapter firstly explores the ontological and epistemological underpinnings of research methodology. The quantitative vs qualitative debate is discussed and is linked to the argument for pragmatic perspectives and increasing use of mixed methods approaches. The prevalent issues are provided in order to evidence the researcher's reasoning for the methodology chosen in the current research. The chapter closes by reflecting on the epistemological standpoint, the chosen research design and ethical considerations of the current research.

3.2 Methodology in Real World Research

Research is described as a way of knowing or understanding and is a process of systematic inquiry (Mertens, 1998, p. 2). Research is generally centred around a particular paradigm, which can be described as a way of looking at the world (Cohen, Manion, & Morrison, 2011; Mertens, 1998), and a shared belief system or set of principles (Cohen et al., 2011). There are a number of prominent paradigms utilised within research, each with their own set of different beliefs. A researcher's ontological beliefs; the nature of reality, and their epistemological beliefs; the nature of knowledge, determines the paradigm, and thus the methodological approach taken (Guba, 1990).

3.2.1 Positivism

Positivism is rooted in realist ontology (Guba, 1990); the belief that only one reality exists and that a researcher can uncover that reality (Mertens, 1998). Positivists hold the epistemological position of objectivism, objectively gaining 'true'

answers, and doing so by controlling for both inquirer bias and confounding factors (Guba, 1990). Positivism has, however, been criticised as being reductionist and deterministic (Lincoln & Guba, 1985). Salomon (1991) argues that the assumption of positivists that their research is value free is deluded, as value judgements -such as choice of variables and interpretation of findings- are a part of all research.

3.2.2 Post-positivism

Post-positivists somewhat agree that there is existence of a reality, however, they would argue that this reality cannot be known in its entirety (Mertens, 1998). Post-positivists acknowledge alternative explanations for observations (Mertens, 1998) and recognise that individual and contextual differences act as moderating factors (Kaplan, 2015), thus taking the ontological perspective of critical realism (Guba, 1990). Post-positivists also try to comprehend causal relationships (Scotland, 2012), using modified experimental methods, such as research in more natural settings and introducing discovery in the research methods (Guba, 1990).

3.2.2(i) Research Designs: Positivist and Post-positivist Paradigms

The realist perspectives are commonly linked to experimental research, which typically focus on groups trends (Robson, 2011) and cause and effect relationships (Mertens, 1998). A randomised control trial (RCT) is regarded the 'gold standard' research design (Robson,2011), as participants are randomly assigned to either an experimental group or a control group.

Quasi-experimental designs are considered 'almost' true experimental designs (Mertens, 1998) and 'the second-best choice' when the impact of an intervention is studied based on pre-established groups, rather than randomly assigned groups (Mertens, 1998).

It is suggested that experiments in natural settings have advantages over laboratory experiments, including greater generalisability, a reduction of demand characteristics and wider participant availability. However, difficulties may be encountered, such as ethical issues, lack of control of extraneous variables, threats to validity and difficulties in random allocation of participants (Mertens, 1998; Robson, 2011).

Single-case experimental designs (SCEDs) offer an alternative when faced with these challenges (Mertens, 1998). SCEDs are concerned with evaluating the effectiveness of an intervention on an individual (Mertens, 1998), through taking a series of repeated measures on a dependent variable (Robson, 2011). The data generated is typically represented graphically and visually analysed, which has been met with some criticism, not least regarding increased subjectivity (Mertens, 1998).

3.2.3 Social Constructivism

The ontological position of social constructivists is that of relativism. From this perspective, realities are multiple mental constructions that are based on experience and created by those individuals that hold them (Guba, 1990). Constructivists take a subjectivist epistemological standpoint. Subjective interaction is deemed necessary in order to access realities that exist in the minds of others (Guba, 1990).

3.2.3(i) Research Designs: Social Constructivist Paradigm

The social constructivist paradigm is commonly associated with qualitative research methods (Mertens, 1998) and flexible designs (Robson, 2011), often in the form of case studies, ethnographic studies and grounded theory studies (Robson, 2011).

A case study involves the detailed study of an individual or group (Mertens, 1998; Robson, 2011). Ethnographic studies involve the researcher becoming immersed in the society under study (Creswell & Creswell, 2018) as to describe and analyse their actions and beliefs (Mertens, 1998). Grounded theory research (Glaser & Strauss, 1967) aims to generate theory based on the data gathered. Although grounded theory can be utilised with quantitative data, it is most commonly used in qualitative studies (Mertens, 1998). There are limitations to utilising flexible research designs, particularly the generalisability of the findings and the trustworthiness of the research (Robson, 2011).

3.2.4 Quantitative vs Qualitative: Opposing Methods?

Purists from opposing paradigms advocate the 'incompatibility thesis' which claims that qualitative and quantitative research paradigms and the associated methods cannot be mixed (Johnson & Onwuegbuzie, 2004).

Beuving and Vries (2015) suggest that the link between epistemology and research methods is not a necessary or logical relation. Although there are pragmatic differences between the paradigms, it is argued that similarities are often overlooked (Johnson & Onwuegbuzie, 2004); both use empirical observations and apply procedures that aim to counteract threats to validity. Johnson and Onwuegbuzie (2004) suggest that researchers need a robust understanding of *many* research methods in order to expand communication, encourage collaboration and deliver 'superior research'.

3.2.5 Pragmatism and Mixed Methods

Increasingly researchers are utilising both qualitative and quantitative approaches. The 'mixed methods' approach is likely to have flourished as a consequence of the quantitative vs qualitative 'paradigm wars' (Robson, 2011). Mixed methods researchers take a pragmatic perspective, preferring action over

philosophising, and viewing knowledge as both constructed and centred on reality (Johnson & Onwuegbuzie, 2004). Researchers determine when the various research approaches are most helpful in order to answer the research questions (Johnson & Onwuegbuzie, 2004).

It is suggested that any method of inquiry can be associated with some error: "No such thing as an error-free method of inquiry exists" (Sechrebt & Sidani, 1995, p. 84). Sechrebt and Sidani (1995) suggest that triangulation of different methods should be exploited, to diminish some of the 'errors' associated with the different methods. Johnson and Onwuegbuzie (2004) argue that by putting together procedures from quantitative and qualitative approaches, researcher choices are less restricted, and a superior product is produced, which "Opens up an exciting and almost unlimited potential for future research" (p. 20).

There are many ways of designing mixed methods research, but the process necessitates a decision about whether priority is assigned to one method over another, and consideration of sequence/order in which data are used (Morgan, 1998).

3.3 Methodological Considerations

3.3.1 Epistemology and Design in the Current Study

Research evaluating Forest School has primarily taken a constructivist perspective, utilising qualitative data collection methods. Therefore, it was felt that a primarily post-positivist position should be taken in order to answer questions related to outcome effects and efficacy for nursery aged children.

However, this more rigid approach did introduce conflictions with the theoretical underpinnings of outdoor learning. As previously discussed, outdoor learning has been linked to experiential learning and is associated with the constructivist

movement (O'Brien & Murray, 2007; Seyfried, 2002). Constructivist pedagogy is based on the recognition that there are no objective realities and that we each differ in our constructions of the world (Seyfried, 2002). Therefore, the researcher wanted to capture an element of individual experience to add a contextual element to the evaluation.

Consequently, a pragmatic perspective was taken, leading to two different research strands. The primary quasi-experimental research design (See Chapter 4) provides quantitative information on the impact of Forest School at a group level. Case studies (See Chapter 7) provide qualitative illustrations of individual children's experiences based on the perspectives of FSLs. Given the limited experimental research that considers the impact of Forest School, the research is regarded a sequential mixed methods design and the case studies should be regarded as a supplementary element.

3.3.2 Mixing Methods: Some Considerations

It is argued that mixing methods enables rich data to be gathered and triangulated (Kellaghan, 2010) and increases the validity and reliability of the research due to the removal of the constraints associated with using one method (Cohen et al., 2011). However, there are concerns that using a mixed methods approach generates practical issues, such as skills, training and timing, and implementation issues, such as lack of integration of findings, creating disjointed and unfocused research (Robson, 2011).

Robson (2011) also highlights the potential for discrepancies in findings from qualitative and quantitative elements. Johnson and Onwuegbuzie (2004) suggest that the goal of mixed methods research is to expand understanding, not to corroborate conclusions. If there are conflicts within the findings, then greater knowledge is achieved, and researchers can modify their interpretations.

3.3.3 Quantitative Methods in Outdoor Education Research

As can be seen from the literature in Chapter 2, attempts to utilise quantitative research methods when evaluating Forest School is minimal. However, outcomes related to outdoor adventure education (OAE) have been investigated using quantitative methods, although this is still relatively low compared to other research fields (Scrutton & Beames, 2015).

Scrutton and Beames (2015) completed a review of 22 studies and 6 meta-analyses measuring the impact of OAE on personal and social development. They identified a number of methodological limitations that appear to arise in research related to outdoor education. The research often comprises low sample sizes as researchers frequently have to use readily available samples, which impacts on the statistical power and generalisability of the data. Also, tailor-made questionnaires are often used that are lacking in reliability and validity and result in ceiling and floor effects. It was also highlighted that confounding variables influence the data, making it difficult for researchers to link effects to the intervention. To counteract these limitations, Scrutton and Beames (2015) suggest: generalisations should be made in relation to the representation of the sample; 'established' questionnaires should be used; data should be provided related to the statistical analysis chosen (e.g. tests of normal distribution); and control groups should be utilised.

3.3.4 Ethical Considerations

Ethical approval for the current research was received on 27 March 2017 from the University of Nottingham (See Appendix 2). *The British Psychological Society Code of Human Research Ethics* (BPS, 2014) has been adhered to throughout the research (See Table 3.1).

Table 3.1: Ethical considerations in the current research

Ethical Issue	Information
Risk	Risk in relation to the intervention was viewed as minimal as the researcher made no changes to the intervention or usual running of the nursery practice. It was felt that upon completing some of the measures, parents may have questions relating to some of the items. Parents were given the researcher's contact details and encouraged to contact the researcher with any questions.
Valid Consent	Informed written consent (See Appendix 3) was gained from the nursery staff involved and every parent/carer of the children included in the research. All parents and nursery staff involved in the research were provided with verbal information, a study information sheet (See appendix 4) and the opportunity to discuss the research. All consent forms were gained prior to any data collection began. Children were not asked for consent as no direct measures were undertaken and there were no changes made to their nursery experience. Some of the parents provided consent for their child's participation in the summer research period (pilot study). The second term pupils from this, were also included in the main research, therefore these parents were provided with a research update form (See Appendix 5).
Confidentiality	All data collected was anonymised, using a numbered coding system. Consent forms, questionnaires and the identifying numbers were stored separately in secure locations. The diaries were completed electronically by the FSLs and were stored securely by the researcher. The interviews were audio recorded and transcribed anonymously. Any information that could potentially identify the child was excluded from reporting.
Giving Advice	The researcher's position as a researcher was made clear to the parents and nursery staff.

	If any of the participants (children, parents and school staff) were to have required additional support unrelated to the research, the plan was to direct the Head Teacher to the nursery's assigned Educational Psychologist.
Deception	Participants were not deceived.
Debriefing	Upon completion of the data analysis, participants were given a debrief letter (See Appendix 6). Executive summaries of the research outcomes were made available to participants.

3.4 Research Context

3.4.1 Maplefield Nursery[3]

Maplefield Nursery is an average-sized nursery school, with the majority of families of White British heritage. The proportion of attending children with SEN is generally above average. The most recent Ofsted report (March 2015) provided Maplefield with an 'outstanding' rating in all areas. The nursery holds many awards including the UNICEF (United Nations International Children's Fund) *Rights Respecting School Award*, the NACE (National Association for Able Children in Education) *Challenge Award*, the *Inclusion Quality Mark* (IQM) and *ECO Schools Green Flag Award.*

The nursery is part of the LA's open schools network, which provides opportunities for other teachers to visit the nursery on a regular basis to observe the teaching and learning. The nursery also collaborates with the local college to provide a module on outdoor learning for those completing the NVQ (National Vocational Qualification) Level 3 in Child Care.

Personal, social and emotional development underpins the nursery practices. This includes the well-being of children, staff and parents, as the Head Teacher considers the nursery 'a learning community'. A few years ago, the nursery introduced the use of the Ferre Laevers emotional well-being and involvement scales (Leuven Scales) into their practice, working intensely with the Early Excellence Centre and the developer of the scales, Professor Laevers. All the staff are involved in completing the Leuven Scales for every child once they have settled into the nursery (after half a term). This involves completing two two-minute observations of the child inside and outside.

[3] The information provided is based on informal observations, discussions with staff and an interview with the nursery Head Teacher.

The two teachers at Maplefield Nursery share curriculum responsibilities. One teacher manages maths and knowledge of the world and the second focuses on literacy, communication and language and Forest School. The nursery has a free flow learning environment, in which children are free to venture outside when they wish to. Being outdoors is not treated as a reward; children can access the curriculum inside and outside. Staff describe this as a 'continuous curriculum'. The children are free to explore the different activities available, with staff collaboratively teaching the children. The Head Teacher feels that being outdoors impacts positively on well-being, which is why the children are given the freedom to explore the outdoors and the responsibility to make their own choices.

The nursery deliver Every Child a Talker (ECAT: DfE, 2008), working closely with speech and language therapists. The nursery's most recent Ofsted report noted that a significant strength of the nursery is the emphasis on children's acquisition of language skills. The nursery staff model language, reinforce and introduce new vocabulary and integrate different resources to reinforce language development. Every Child a Mover (ECAM: White, 2015) is also built into the curriculum, with staff targeting physical development through the outdoor learning opportunities and targeted physical development time, e.g. yoga sessions.

The nursery staff integrate parents in the learning process through utilising *Tapestry*, an online learning journey. Staff and parents can upload pictures and information for each child, creating a joint learning journey, with parents valued as equal educators. The tool allows staff and parents to communicate openly with children about things they have been doing at home/school.

The Head Teacher feels that Maplefield Nursery is unique because of their emphasis on outdoor learning, emotional well-being and the development of Forest School on-site. The nursery staff have created an engaging multi-sensory outdoor environment for the children, including a large sand pit area, water features and climbing apparatus (See Section 3.4.1(i)).

Forest School has evolved over many years at Maplefield Nursery, after one of the teachers received the FSL training. The whole staff team are now skilled to some degree in the Forest School approach. The nursery staff previously took the children off-site to access Forest School. However, the nursery staff developed their own site, and rather than having Forest School as an 'add on', the Forest School philosophy is 'threaded through' all aspects of learning. The Forest School woodland area attached to the school encompasses a child made greenhouse, garden, pond, trees, seating areas and dens (See Section 4.4.1).

The nursery also has an allotment system. The children have helped plant fruit trees to enable them to see the fruit growing, which they collect and cook with. The purpose of this is to get the children involved with planting and being respectful of the environment.

3.4.1(i) Photographs of Maplefield Nursery's Outdoor Space



Photograph 3.1: Greenhouse



Photograph 3.2: Bike track



Photograph 3.3: Outdoor space



Photograph 3.4: Sand and water play area



Photograph 3.5: Climbing frame

3.5 Initial Procedures

3.5.1 Development of Outcome Measures

'Collaborative inquiry' has been advocated for use in outdoor education research (Rea, 2008) and can be linked to experiential research, in which participants are involved in the content, activity and creative thinking of the research (Heron, 1981). Heron (1981) argues that researchers should interact with participants, allowing them to contribute to hypothesis making and/or formulation of conclusions. Without this involvement, Heron (1981) suggests the wrong questions can be asked, misinterpretations of constructs can occur, and the researcher can lack understanding of the entity being researched.

Therefore, a focus group was completed with nursery staff in order to decide the outcome measures. This not only added an element of collaborative inquiry but also gave staff some ownership over the purpose of the research and increased stakeholder engagement. A brief review of the literature was also undertaken to establish if the outcomes identified by the staff were suitable outcome measures.

3.5.1(i) Focus Group

A structured method for completing the focus group was developed and implemented by the researcher (See Appendix 7). The focus group was held with the researcher, the Head Teacher and two FSLs. Firstly, ground rules were established, then details of the research project were provided.

Staff noted the benefits they believe the children experience due to Forest School. Once finished, these benefits were discussed, and the staff grouped them into areas they felt were similar (See Appendix 8). The staff then collectively named these (See Figure 3.1).



Figure 3.1: Themes Identified during Focus Group

As there were a number of different themes, the staff were asked to choose the areas they felt would be most important to measure, taking into account the practicality/feasibility of measuring certain areas. The group decided they wanted to measure:

1. emotional well-being;
2. relationships; and
3. communication

3.5.1(ii) Outcome Measures in Previous Research

Research was reviewed if it provided a broad range of outcomes through evaluation and exploration, rather than research that was targeted to measure specific outcomes. Six studies were reviewed (Harris, 2015; Massey, 2005; Maynard, 2007; O'Brien, 2009; O'Brien & Murray, 2007; Ridgers et al., 2012), as were outcomes highlighted on the FSA website (FSA, 2017b) and by Ofsted in the

document *Outdoor Education: Aspects of Good Practice* (Ofsted, 2004). It was evident that emotional well-being, relationships (i.e. social development) and communication were suitable outcome measures in an evaluation of Forest School (See Appendix 9). Therefore, specific research questions were developed, as outlined below.

3.5.1(iii) Research Questions:

- Does participation in Forest School have an impact upon the emotional well-being of nursery aged children?
- Does participation in Forest School have an impact upon the relationships and social development of nursery aged children?
- Does participation in Forest School have an impact upon the communication skills of nursery aged children?

4 Quantitative Research Element

4.1 Introduction

The following section details the quasi-experimental design undertaken in the current research. The qualitative research methodology is discussed in Chapter 6. The experimental group took part in the typical Forest School sessions and the control group continued their usual timetable. The independent and dependent variables are detailed in Table 4.1 below.

Table 4.1: Details of quasi-experimental research design

Independent Variables	**Dependent Variables**
1. Group Between groups variable with two levels (experimental and control) **2. Time** Within groups variable with two levels (Pre-Intervention T1, Post-Intervention T2)	Social and Emotional well-being Separate Scales[4]: • Attachment/Relationships • Initiative • Self-regulation
	Communication

4.1.1 Development of Design

There were a number of designs considered when developing the design of the current research. Utilising two or three nurseries would have allowed for three groups (experimental, comparison, control): one nursery would complete their usual Forest School sessions (experimental group); one would complete a different form of outdoor learning (comparison group); and one would continue with their usual nursery practice (control group). Staff at Maplefield Nursery were involved in the research from the beginning of the process (See Section 1.1). As noted, the

[4] These are discussed in the following sections

nursery has a unique approach (See Section 3.4.1). It would have been very difficult to have matched other nurseries from a similar area, with a similar ethos and form of practice. Although using one nursery for the current research resulted in a lower number of participants, had more than one nursery been utilised, the reliability and validity of the research would have been threatened due to the likelihood of confounding variables.

4.2 Pilot Study

4.2.1 Development of Data Gathering Tools

As the children involved in the current study were aged between 3 and 4 years old, it was recognised that scales completed by adults would perhaps be the most suitable method for collecting data in relation to the outcome measures. A review of developed scales was undertaken to identify the appropriate scales which could be used to measure the identified outcome measures (emotional well-being, relationships and communication). This task proved particularly difficult given the target age, the specific outcome areas, the need for valid and reliable measures and the need for the scales to be accessible for parents to complete. It became apparent through the review process that the 'emotional well-being' and 'relationship' outcomes might benefit from being combined as a social-emotional measure -as was evident in most scales for these areas. Therefore, some combined scales were considered as can be seen in Table 4.2.

Table 4.2: Measures reviewed for use in the current research

Measure	Comments
Early Years British Ability Scales (BAS; Elliot, 1983)	• Specifically focuses on language skills rather than communication and language within a social context
The Communication Checklist (Pearson Clinical, 2017a)	• Too long - 70 items for only one element of the questionnaire • Targeted to children aged 4-16 years - not suitable for participant age range
Social Skills Improvement System (SSIS; Pearson Clinical, 2017b)	• Complicated completion procedures • Assessment focuses on problem behaviours
The Brief Infant and Toddler Social and Emotional Assessment (BITSEA; Pearson Clinical, 2017c)	• Standardised screening instrument to evaluate social and emotional behaviour • An appropriate length for parents to complete (42 items) • Not suitable for age range – for children aged 12-36 months • Four domains within the assessment focus on negative social and emotional behaviours such as aggression and depression/withdrawal -not considered appropriate for the purpose of the current research
The Ages and Stages Questionnaire (ASQ; Squires, Potter, & Bricker, 1995)	• Is utilised as a parental screening tool for social and emotional health in children aged 1-72 months. • Asks questions on self-regulation, compliance, social-communication, adaptive functioning, autonomy, affect, and interaction with people • High validity and reliability • Uses different scales for different age brackets – not suitable as children would have changed in age from, pre- to post-intervention and participants were not all the same age
The Devereux Early Childhood Assessment Preschool Program, 2nd Edition (DECA – P2; LeBuffe & Naglieri, 2012)	• A strengths-based assessment and planning system for children aged 3-5 years old • Measures behavioural concerns and social and emotional competency using three scales: initiative; self-Regulation; and attachment/relationships (See Section 4.8.1 for further information) • Short measure and suitable for participant age range

Given the complexities in finding a communication measure, the researcher developed their own communication measure (See Appendix 10) based on the Early Learning Goals for Communication and Language Development in the *Early Years Foundation Stage Profile* (EYFS: DfE, 2017).

The DECA-P2 was considered the most suitable measure for the current research as it is a relatively short measure, suitable for completion by parents and for the age range required. It was decided for the pilot study to only utilise some of the scales within the DECA-P2. In order to try and create separate outcome measures for emotional well-being and for relationships, the Self-Regulation Scale was utilised for the emotional well-being outcome and the Attachment/Relationships Scale was used for the relationships outcome. Consent was gained from the authors (via email correspondence) to adapt and utilise the DECA-P2 for the current research. The authors consented to adaptation of the measure for the purpose of the current research, providing that each scale was used in its entirety.

Therefore, a questionnaire was generated which included the Self-Regulation Scale (emotional well-being) and Attachment/Relationships Scale of the DECA-P2. This was accompanied by the communication measure developed by the researcher.

4.2.2 Pilot Study Procedure

The design used during the pilot phase was consistent with the main study. The children included in the pilot study were in their second and third terms of nursery during the summer term of 2017. As with the main research design, the third term pupils formed the experimental group (N=13) and the second term pupils formed the control group (N=11). The purpose of this phase was to pilot the questionnaires with parents. Questionnaires were given to parents by school staff members. Parents were asked to complete these two weeks prior to the Forest School starting and immediately after the Forest School had finished.

4.2.3 Learning Points from Pilot Study

The consent response rate was initially low (N=10), perhaps due to the time allowed for responses and because parents were given the consent forms to take away with them.

The response rate to the parent questionnaire was low at pre-intervention (N=13) and post-intervention (N=6), thus changes needed to be made to try and increase response rate, and contingencies needed to be put in place in case response rate was low during the main study. It was considered that the response rate from parents was low due to nursery staff handing out the questionnaires. The Head Teacher suggested that as parents get daily forms from the nursery staff, the questionnaires may not have been regarded as important.

The pilot study questionnaire raw data were scored (See Appendix 11), however, the data were not statistically analysed and will not be discussed further. Inspection of the data highlighted that many parents were scoring their children highly for the attachment measure of the DECA-P2 on the pre-intervention questionnaire, thus ceiling effects occurred.

4.2.4 Changes Made to Research

It was decided that the communication measure lacked validity and reliability, having been developed by the researcher. Additional time was spent reviewing measures, resulting in the FOCUS-34 being chosen (See Section 4.8.2). As noted, the Attachment/Relationships Scale generated ceiling effects. To attempt to reduce ceiling effects, the Attachment/Relationships Scale and Self-Regulation Scale were combined, along with the addition of the Initiative Scale of the DECA-P2. These three scales combined are considered a measure of 'social and emotional competency' by the developers. It was felt that the term 'competency' implied a within-child, deficit testing measure and may hold particular connotations for stakeholders. Therefore, the outcome was labelled 'social and

emotional well-being', as 'well-being' provided a positive term which was hoped to increase engagement from all stakeholders. However, it is recognised that 'well-being' is a construct which can have various interpretations.

It was decided that data would also need to be collected from staff, given the low questionnaire response rate from parents. It was hoped that the parent and staff data could be triangulated. In order to increase parental completion of the questionnaires, the researcher attended the nursery at various times to meet parents and give them the questionnaires individually.

4.2.4(i) Changes Made to Research Questions

It was deemed helpful to individually analyse each of the scales on the overall social and emotional measure, to develop further understanding of the outcome data. Therefore, the three separate scales are considered as supplementary research questions:

1. Does participation in Forest School have an impact upon the overall social and emotional well-being of nursery aged children?

    - Does participation in Forest School have an impact upon the attachment/ relationships of nursery aged children?
    - Does participation in Forest School have an impact upon the self-regulation of nursery aged children?
    - Does participation in Forest School have an impact on the initiative of nursery aged children?

2. Does participation in Forest School have an impact upon the communication skills of nursery aged children?

4.3 Participants

4.3.1 Inclusion Criteria

The nursery typically provides weekly Forest School sessions to children when they reach their third term at the nursery. Sometimes, children do not start Forest School until their fourth term, depending on numbers and individual differences. Following their third term, the children continue to receive Forest School until they leave and begin attending school. As the purpose of the research is to evaluate the impact of Forest School, only children that had not completed Forest School previously could be included in the experimental group. The control group had to consist of children that had not previously completed Forest School and were not completing Forest School during the research period. This resulted in mainly third term children within the experimental group. A decision was made to exclude the children in their first term from the research, due to them not having had any previous nursery experience, which may have impacted on the data collected.

4.3.2 Sampling Procedure

A possible 32 children were identified for participation in the main research beginning in September 2017. Parents of all the children were given consent forms (See Appendix 3) and Information sheets (See Appendix 4) by the researcher. Verbal information regarding the research was also given. It was made clear to parents in the consent forms that along with nursery staff, they would be involved in the study and be asked to complete questionnaires. The parent participants were a self-selecting sample. Consent was gained prior to the summer holidays and the research began at the beginning of the next academic year.

4.3.3 Sample Size

Parental consent was gained for 24 children, 13 in the experimental group[5] and 11 in the control group. At completion of the research the experimental group contained 11 children. One of the children moved nurseries during the study and for another child, the post-intervention questionnaire was incorrectly completed. Attendance at the Forest School sessions was recorded by the FSLs. It was decided that attendance at fewer than seven sessions would result in exclusion from the study. All children in the experimental group attended seven or more Forest School sessions. Twelve parents completed questionnaires at pre-intervention, thus generating a participant sample size of 12. The Head Teacher was also a participant of the quantitative research element.

4.3.4 Description of Participants

4.3.4(i) Children

Details of the children included in the research are provided in Table 4.3. As noted, each term a group of pupils start the Forest School sessions, these are typically pupils in their third term. Therefore, the experimental group contains only third term pupils and the control group is predominantly second term pupils (third term N=2, second term N=9). Pupils begin attending Maplefield Nursery at different ages, thus the experimental and control groups were mixed in age. Although the control group had a lower mean age, the children did not significantly differ on any pre-intervention measures. This compromise was necessary in order to ensure participant numbers.

[5] It should be noted that a large proportion of the second term pupils (control group) that participated in the pilot study were included in the main study. These children had moved into their third term and were included in the experimental group. Parents of these children were sent a research update form (See Appendix 5). Parents were given these directly and re-informed of their right to withdraw. The data gained during the pilot study was not analysed or used in the main study analysis.

Table 4.3: Participant Characteristics

	Mean age in months (Range)	Gender Male:Female
Experimental	47 (45-48)	7:4
Control	44 (41-47)	7:4

4.3.4(ii) Parents

Parents that consented to their child's participation in the research were encouraged to complete the pre-intervention and post-intervention questionnaires. Parents self-selected whether they would participate in the study. Pre-intervention questionnaires were completed by 13 parents, and only three of these parents completed the post-intervention questionnaire. Due to circumstances outside the researcher's control, the researcher was unable to visit the nursery at post-intervention to engage parents in completing the questionnaires. The implications of this are discussed in Chapter 8.

4.3.4(iii) Head Teacher

As a result of the pilot study, the research was adapted to include staff questionnaires. Initially, several staff members were going to complete the questionnaires, due to time constraints and varying degrees of knowledge of the children.

However, it was decided that the Head Teacher would complete all the questionnaires as she had equal knowledge of the children. It is recognised that this is likely to have increased participant bias, given the Head Teacher's position within the nursery and research. Nonetheless, this potentially increased the validity of the measure, as it reduced the number of staff members that would

need to complete the questionnaires, and thus the number of interpretations of the questionnaire items.

The Head Teacher is a qualified teacher and has a master's degree in education. She has been the Head Teacher at Maplefield Nursery for 29 years.

4.4 Experimental Condition

4.4.1 Forest School

The Forest School sessions are led by Level 2 and Level 3 trained FSLs. The sessions run for 10-week cycles, every Tuesday morning and afternoon (the content of the sessions are the same), lasting approximately two hours each. The children attend either the morning or afternoon session depending on their nursery attendance that week. The children joining Forest School for the first time (i.e. the experimental group) complete Forest School with children that have already completed Forest School (i.e. children in their fourth and fifth terms).

Sessions are planned by the FSLs, including both targeted curriculum activities and child-led activities. However, the sessions are flexible and can be adapted. The sessions develop each week and aim to extend the children's skills based on the learning in the previous sessions. Aspects of the curriculum are incorporated in each session. The FSLs have high expectations of the children and there is an emphasis on group working. The FSLs try to develop an understanding of where the children are academically and developmentally prior to them engaging in Forest School, in order to provide the appropriate level of teaching and support during the sessions[6] (See Chapter 2 for a description of Forest School).

[6] This information was gained during an informal discussion with the FSL.

4.4.1(i) Example Session

Table 4.4 provides an overview of the first session of Forest School (within the research period), based on observations by the researcher. The structure of the Forest School sessions were similar each week. However, the main activities (i.e. story of the week, linked activity and game) were different each week, and the level of challenge and child-led time increased.

Table 4.4: Overview of Forest School session one

Time (Approx)	Activity	Brief Description
09.00	Getting Ready	The children arrived at the nursey and were taken to a classroom where they were supported in putting coats, waterproof jumpsuits and wellies on.
09.30	Caterpillar	Once ready, the children were asked to line up as a 'caterpillar'. One child was given the job of being the leader. The children put their hands on each other's shoulders and walked out to the Forest School space as a caterpillar.
09.35	Number Tree	The number tree has various hanging leaves with numbers on. The FSLs engaged the children in counting activities.
09.40	Shelter	The children then walked to the shelter in which there are wooden logs for the children to sit on and pictures of trees.
09.45	Counting leaves/ pinecones	The FSLs handed out the 'magic counting cones' and the children put their cones, one by one, into a basket. They chose a numbered leaf depending on how many cones were in the basket. The children then had to count to the highest number together and the child with the highest number was asked to "hang your number on the number tree because that's the number of friends we've got today".
10.05	Story of the week	The story of the week, about a spider, was read to the children. The FSLs engaged in discussion with the children about the story.
10.25	Bug Hunt	The activity was linked to the story of the week. The children were asked to find the spiders friends. Firstly, the children had to find toy bugs hidden around the Forest School space. The children were then given magnifying glasses and were encouraged to explore the site and find real bugs.
10.50	Snack Time	The children then returned to the shelter for snack time. The children were given hot chocolate and 'energy' biscuits.
11.10	Game	The next activity involved a group game called 'spider chasing the fly'.
11.25	Caterpillar	At the end of the session the children were asked to help pack away any equipment and reform the caterpillar. The children then walked back into the classroom as the caterpillar. The children were supported in removing their outerwear.
11.30	Reflection	Once ready, the children sat on the carpet. The children watched a slideshow of the photographs and videos taken by the FSLs during the session. The FSLs asked the children questions about what they were doing in the photographs and encouraged them to share their experiences with the other children.

4.4.1(ii) Photographs of the Forest School Site at Maplefield Nursery



Photograph 4.1: Forest School walkways



Photograph 4.2: Forest School seating area



Photograph 4.3: Forest School mud kitchen



Photograph 4.4: Forest School greenhouse



Photograph 4.5: Forest School pond



Photograph 4.6: Forest School space



Photograph 4.7: Forest School seating area

4.5 Fidelity Checks

There is no set 'model' of delivery or training of Forest School in the UK (Knight, 2018; Leather, 2018), and FSLs have flexibility in planning the sessions. The principles of Forest School identified by the FSA (See Section 2.7) are "wide enough to encompass an extensive range of practices that can be called Forest School; Forest School is rightly celebrated by the FSA as a broad church" (Knight, 2018, p. 21). Therefore, there will inevitably be some differences between schools in how they deliver Forest School. However, the FSA principles have been developed following exhaustive debates with its members and are therefore considered useful in considering the fidelity of the implementation of Forest School at Maplefield Nursery.

A Forest School fidelity observation schedule was created using these principles, and two fidelity checks were completed during session two and session nine.

Discussions were had with the staff during the first fidelity check, as can be seen in the completed observation schedules (See Appendix 12). The fidelity checks identified that a high proportion of the FSA principles were evident.

4.6 Control Condition

The children in the control group received their usual nursery practice, which involves a large amount of outdoor exploration (See Section 3.4.1). This was not deemed an intervention or confounding variable, as the experimental group also receive this as their usual nursery practice. They received no interventions, other than what would be typically received at the nursery, including 'Earth Elves' (discussed below). The attendance of the children in the control group was not recorded, given that the attendance is part-time for every child and can vary from child to child and from week to week. The Head Teacher was asked to report to the researcher if any participant had an extended amount of time away from the nursery (more than a week).

4.6.1 Earth Elves

Children in their first and second term have the opportunity to engage in a weekly session of 'Earth Elves'. This has been developed by the Maplefield Nursery. The Head Teacher describes this as 'nature play', as to encourage the children to utilise the environment that the nursery provides. The session is run by one staff member, a Level 3 trained FSL, with around eight children per session.

The session lasts for approximately an hour and can take place anywhere in the nursery grounds, including the car park (e.g. to teach road safety). Exercise is always included, along with other elements of the curriculum, such as phonics. The children engage in maintenance of the garden and litter picking.

Although some elements of Earth Elves are considered similar to Forest School, such as being run by a FSL, there are a number of differences. Firstly, the children choose each week if they want to engage; it is an added part of the free-flow learning environment. Therefore, the children do not engage in Earth Elves weekly, and the group is always different, unlike the Forest School sessions. The activities are different to Forest School activities; at Earth Elves there is a focus on conservation of the outdoor nursery environment.

Although participation in Earth Elves is considered a confounding variable, removal of pupils that were taking part in Earth Elves or had previously taken part in it would have meant the research could not have taken place, as *all* children in the sample had taken part in Earth Elves at least once. Therefore, it was considered a necessary compromise and has been taken into account when considering the data.

4.7 Data Collection Procedure

On the 6 September 2017 the researcher provided the nursery Head Teacher with the pre-intervention staff questionnaires. The researcher then made numerous visits to the nursery at different drop off and pick up times to give the parental questionnaires to parents.

Following the completion of the 10 sessions of Forest School, the researcher returned to the nursery on the 5 December 2017 to provide the Head Teacher with the post-intervention staff and parent questionnaires. For a timeline of the Forest school sessions and the quantitative data collection see appendix 13.

4.8 Data Gathering Tools

A number of measures were considered for use (See Section 4.2.1). The measures deemed most suitable in answering the research questions are discussed in the following section (See Appendix 14).

4.8.1 DECA-P2

The Devereux Early Childhood Assessment for Pre-schoolers, Second Edition (DECA-P2) is an American behaviour rating scale which can be completed by parents and/or teachers. The assessment measures within-child protective factors of resilience and screens for behavioural concerns in children aged 3 to 5. The within-child protective factors are related to social and emotional competency.

4.8.1(i) DECA-P2: Overview of Content, Administration and Scoring

The DECA-P2 contains 38 items and uses a 5-point Likert scale. The protective factors are separated into three scales: initiative, self-regulation and attachment/relationships (See Table 4.5). These scales together form the overall measure of social and emotional well-being, providing "a very reliable indicator of the child's overall social and emotional functioning" (LeBuffe & Naglieri, 2012, p. 93).

The DECA-P2 was used with staff and parents in adapted form. Respondents were asked to consider the child's behaviour over the past 2 weeks, rather than the 4 weeks in the published version, in order to fit around Forest School implementation time scales.

Table 4.5: Overview of the items on the DECA-P2 scales (LeBuffe & Naglieri, 2012, p. 92) and considerations for the current research

Scale	What is it Measuring?	Items on the scale: 'During the past 2 weeks, how often did the child…'	Comments
Attachment/ Relationships	The child's ability to promote and maintain mutual, positive connections with other children and significant adults	9 items: • Act in a way that made adults smile or show interest in him/her • Seem happy or excited to see his/her parent or guardian • Show affection to familiar adults • Ask adults to play with or read to him/her • Trust familiar adults to believe what they say • Seek help from children/adults when necessary • Appear happy when playing with others • Look forward to activities at home or school (for instance, birthdays or trips) • Show a preference for a certain adult, teacher, or parent	The items on this scale relate mainly to relationships and social interactions with adults. The other two measures have items related to social interactions with other children. When interpreting the results, it should be borne in mind that the overall social and emotional score is somewhat reflective of social skills with peers. Whereas the attachment scale is predominately measuring relationships with adults.
Self-Regulation	The child's ability to express emotions and manage behaviours in healthy ways	9 items: • Listen to or respect others • Control his/her anger • Show patience • Share with other children • Handle frustration well • Accept another choice when his/her first choice was not available • Cooperate with others	This scale includes items related to emotional regulation and the ability to regulate these emotions in interactions with others.

		• Calm himself/herself down • Play well with others	
Initiative	The child's ability to use independent thought and action to meet his/her needs	9 items: • Show confidence in his/her abilities (for instance, say "I can do it!") • Keep trying when unsuccessful (show persistence) • Try different ways to solve a problem • Try or ask to try new things or activities • Start to organize play with other children • Show an interest in learning new things • Make decisions for himself/herself • Choose to do a task that was hard for him/her • Remember important information	This scale appears to measure a child's perseverance with tasks and initiation of engaging with tasks and peers.

4.8.1(ii) DECA-P2: Validity and Reliability

Tests show that the DECA-P2 has good internal consistency for both parents (Cronbach α =.88) and teachers (Cronbach α =.92). To assess the test-retest reliability of the DECA-P2, parents and teachers rated the same child on two occasions. All the correlations were significant (p <.01). Scores completed by pairs of parents and pairs of staff were compared to measure interrater reliability. The results indicated that the pairs rated the children similarly, with all but one correlation significant (p <.01).

Criterion-related validity was evidenced through comparing (using ANOVA) the social and emotional functioning of 125 children with emotional and behavioural difficulties (EBD), with a comparison group of 126 children selected from the standardisation sample. Tests of convergent validity indicated that he DECA-P2 measures social and emotional competency similarly to other measures. Although, the moderate correlations indicate that it may contain some unique items.

4.8.2 FOCUS-34 (Focus on the Outcomes of Communication Under Six)

The FOCUS-34 (Thomas-Stonell et al., 2012) was developed by speech and language therapists in Canada, over 13 years. The measure is for children aged 18 months to 5 years 11 months and is used by parents and professionals as a tool to evaluate children's communication development following speech and language therapy and/or interventions. The FOCUS-34 is a shortened version of the original FOCUS, created following a review of change data, showing that some items were redundant, insensitive for some groups and had low correlations to the total FOCUS score.

Although the tool was designed to measure change for children with communication difficulties, the items are applicable to all children as the items are not related to difficulties. One of the main reasons for its use in the current study is the emphasis on assessing 'communicative participation', which "refers to the

child's communication and interaction in 'real world' situations at home, school, or in the community" (Thomas-Stonell et al., 2012. p. 7).

4.8.2(i) FOCUS-34: Overview of Content, Administration and Scoring

The FOCUS-34 is divided into two sections; part 1 has 23 items and part 2 has 11 items, each with different 7-point Likert rating scales (See Appendix 14). These sections are added together to compute the FOCUS-34 total score.

The developers were contacted by the researcher to gain consent to utilise the FOCUS-34 in the current research, and to make the adaptations to the wording of the questionnaire for staff[7].

4.8.2(ii) FOCUS-34: Validity and Reliability

High internal consistency was revealed for both parents (Cronbach $\alpha = 0.96$) and speech and language therapists (Cronbach $\alpha = 0.94$). Test-retest reliability was also evaluated with parents that completed the FOCUS on two occasions, showing that total FOCUS scores at Time 1 and Time 2 were significantly correlated ($r > 0.95$). To test inter-rater reliability, two speech and language therapists independently completed the FOCUS within an 8-day period, showing a significant positive correlation between their scores ($r = 0.90$, $p<0.001$). The inter-rater reliability of detected change was also high (ICC = .70; 95% CI: .24-.91), thus the FOCUS is reliable for both practical and research purposes.

Tests of construct validity highlighted that significantly more change was measured during speech and language treatment than wait list intervals ($p<.01$). Convergent and divergent validity was demonstrated against the Ages and Stages Questionnaire-Social Emotional (ASQ-SE) and the Vineland Adaptive Behavior

[7] The headings and items were modified on the professional version to say, 'my pupil' instead of 'my child'.

Scales (VABS-II). Change on the communication questions of the ASQ-SE (communication, compliance and affect domains) and change measured by the domains of the VABS-II were both significantly correlated with the FOCUS. The findings evidence the construct validity of the FOCUS for evaluating real-world changes in communication.

The FOCUS-34 scores were compared at Time 1 and Time 2 to the original FOCUS, predicting the original scores almost perfectly (r = .99). Change scores on the FOCUS-34 highly predicted change scores on the original FOCUS (r = .98). The internal consistency of the FOCUS-34 is extremely high on both the scale scores (alpha = .98) and change scores (alpha = .93).

4.9 Validity and Reliability

There are various different types of validity and reliability in experimental research. Cohen et al. (2011) suggest that threats to validity and reliability cannot be erased entirely, instead the impact of these threats can be reduced by close consideration of validity and reliability throughout the research.

4.9.1 Validity

Validity can be defined as the extent to which an instrument or study measures what it is proposing to measure (Robson, 2011). Internal and external validity are forms of validity commonly addressed in experimental research. These are discussed in more detail in the following sections.

4.9.2 Internal Validity

Internal validity relates to the degree to which a test or piece of research measures what it set out to measure (Robson, 2011). Robson (2011), highlights various threats to internal validity, as identified by Cook and Campbell (1979). Table 4.6

provides a summary of each of these threats, and the measures taken in the current research to counteract or reduce them.

Table 4.6: Summary of threats to Internal Validity and measures taken to control these

	Threat	Summary	Measures taken
1.	**History**	Extraneous variables happening in the participants environment other than those forming a direct part of the enquiry.	The Head Teacher was asked to inform the researcher if any new interventions or significant changes occurred during the study period. Prior to beginning the study, it was decided that one child within their third term would not be included in the research due to their parent recently being diagnosed with a long-term illness.
2.	**Testing**	Experience of the pre-test measures may lead to changes on the post-test measures due to participant bias from practice and experience.	The Head Teacher and parents completed the same measure only twice. Data was sought from both parents and the Head Teacher to account for any parental bias.
3.	**Instrumentation**	Changes to the way participants were measured from pre-test and post-test.	The Head Teacher completed all of the pre-intervention and post-intervention measures to minimise the chance of differences in individual item interpretation. Measures were selected that were suitable for the purpose of the research and appropriate for the participants, including sufficient validity and reliability. All measures were scored by the researcher, using clear and objective scoring criteria.
4.	**Regression**	Participants with particularly high or low scores at pre-test are likely to	Normal distribution of data was not required in the current study due to the use of non-parametric tests.

	move towards the mean at post-test.	
5. Mortality	Participants numbers reduce.	A high sample size was not possible due to the available participants at Maplefield Nursery. Attempts were made to recruit all possible participants. No participants withdrew from the study, however, two experimental participants were lost.
6. Maturation	Participant development/ growth/change over time, unrelated to the study.	A control group was utilised to account for changes which may be due to maturation rather than the intervention. It was not possible to equally match the control and experimental group, which is discussed below.
7. Selection	Differences between the experimental and control groups at pre-test.	Group equivalence was established through pre-analysis checks of homogeneity. The majority of children within the control group were in their second term and were slightly younger than the children in the experimental group. This will need to be considered when interpreting the outcomes.
8. Ambiguity about causal direction	The direction of causation is unclear.	This threat is typically concerned with correlational research, measuring the extent to which two variables correlate. The current research employs a quasi-experimental design with pre- and post-intervention measures.

9. Diffusion of treatments	Intervention effects are transferred to others not in the intervention condition (control group).	The children from the control group and experimental group mix with each other when not at Forest School, and the control group are supported by the staff trained as FSLs. Some of the children also engage in 'Earth Elves'. This may influence the outcomes generated. This would have been reduced if the groups were within different nurseries, yet this would have increased the likelihood of selection effects and confounding variables. Therefore, it was deemed a necessary compromise.
10. Compensatory equalization of treatments	Participants in the control group receive 'special treatment' as compensation for not receiving the intervention.	No changes were made to the usual running of the nursery or the Forest School sessions. The children from the control group and their parents were aware the children would be receiving Forest School in the following school term.
11. Compensatory rivalry	Participants in the control group try to increase performance as compensation for not receiving the intervention.	No changes were made to the usual running of the nursery or the Forest School sessions. The children from the control group and their parents were aware the children would be receiving Forest School in the following school term.

4.9.3 External Validity

The term 'external validity' refers to the generalisability of the study (Robson, 2011), and whether outcomes can be generalised to other groups and settings. LeCompte and Goetz (1982) identified four threats to external validity:

1. Selection: the outcomes of the research are specific to the group being studied.
2. Setting: the outcomes of the research are specific to, or dependent on the setting in which the research took place.
3. History: specific variables may determine or impact on the findings, as such that the same outcomes would not be achieved if replicated.
4. Construct effects: the constructs being studied are specific to the group within the study.

The research has been undertaken in the 'real world' under naturalistic conditions which is hoped to have increased the external validity of the research. The nursery selected the children who would take part in Forest School, based on their typical selection process; the length of time the children had attended the nursery. Randomisation of participants would have increased the generalisability of the outcomes, however, this would have required changing the nursery's typical practice.

As described in Section 3.4.1, the nursery staff have a specific ethos and approach to outdoor practice, and it is acknowledged that this may not be typical of all nurseries. Therefore, a clear description of Maplefield Nursery is provided to make readers aware of the research setting characteristics. It is noted that the outcomes cannot be generalised to all nursery settings, rather, settings which adopt similar practices to Maplefield Nursery. Fidelity checks ensured that the nursery setting deliver the Forest School intervention in line with the FSA principles, increasing the generalisability of the outcomes to other settings which utilise Forest School.

There are likely to have been a number of variables specific to participants during the research which may impact on the generalisability of the outcomes. It is difficult to restrict these variables within real world research, however, the nursery staff were asked to provide the children with their usual nursery practice. In real world research it is important to be mindful of history effects when considering the outcomes.

The constructs being investigated in the current research were developed with the nursery staff. To ensure that these constructs could be generalised to other populations utilising Forest School, a brief review of the Forest School literature was undertaken. It is evident from previous literature that the constructs under investigation are generalisable in relation to Forest School.

4.9.4 Reliability

In experimental research reliability is related most commonly to the stability or consistency of measures over time (Robson, 2011). The reliability of the research measures have been addressed in Section 4.8.

5 Results

5.1 Introduction

This chapter provides an overview of the quantitative data analysis procedure used in the current study, followed by descriptive and inferential statistics for each research question and summaries of the obtained results. The qualitative case studies are presented separately in Chapter 7.

5.2 Approach to Data Analysis

5.2.1 Parametric and Non-parametric Analysis

When undertaking inferential statistical tests, a decision needs to be made between the use of parametric or non-parametric tests. Parametric tests make assumptions about the characteristics of the population (Cohen et al., 2011). Data must meet four assumptions in order to be analysed using parametric testing methods (Dancey & Reidy, 2014):

1. the data should at least be interval level;
2. the data should be normally distributed;
3. the variances of the population should be approximately equal; and
4. there should be no extreme scores

Non-parametric statistical tests do not make assumptions about the population (Dancey & Reidy, 2014) and are based upon the rankings or frequencies of the data (Dancey & Reidy, 2014). They may be less sensitive in detecting differences between groups (Pallant, 2013), thus parametric tests are preferred because they are statistically more powerful, as they utilise more information from the data.

The measures used in the current study utilise Likert-scales. As such, the data produced is categorised as ordinal data and does not meet the parametric assumption of interval or ratio data (Jamieson, 2004). However, some (Norman, 2010) have argued that parametric tests can be used with ordinal data and therefore, further pre-analysis checks were undertaken.

5.2.2 Pre-analysis Checks

The parametric assumptions were considered against the data gained in the current research. The Levenes test for equality of variances did not show any significant results ($p > .05$), indicating that the variances of the two groups were similar (Pallant, 2013). The examination of distribution of the data raised some concerns. QQ box plots (See Appendix 15) indicated reasonable normality in distribution. The Shapiro-Wilk test of distribution was not significant ($p > .05$) for any data set, as can be seen in Table 5.1. However, skewness and kurtosis values from a number of measures were high (See Table 5.1). Furthermore, the histograms (See Appendix 16) showed varying degrees of skewness and kurtosis. Although the small sample size is likely to have influenced the power of these tests of normality, non-parametric analysis was chosen as more than one assumption was compromised. It should be noted that this increases the possibility of a type 2 error due to its lower power (Pallant, 2013).

Table 5.1: Statistical test results for normal distribution of pre-intervention scores

Group	Measure	Shapiro-Wilk			Skewness	Kurtosis
		Statistic	DoF	Sig		
Experi-mental	Social and Emotional Well-being	.924	11	.350	-.212	-1.150
	Communication	.900	11	.186	-.025	-1.755
	Attachment/ Relationships	.925	11	.359	-.384	-1.129
	Self-Regulation	.909	11	.240	-.858	-.266
	Initiative	.939	11	.503	-.545	-.604
Control	Social and Emotional Well-being	.910	11	.245	.375	-.669
	Communication	.897	11	.170	.237	-1.632
	Attachment/Relationships	.934	11	.457	.419	-.489
	Self-Regulation	.891	11	.142	-.058	-1.782
	Initiative	.904	11	.206	.461	-.970

5.2.2(i) Choice of Statistical Test

An Analysis of Variance (ANOVA) would have been completed -which analyses the variance between different groups and within each group- had the parametric assumptions been met. As there are no non-parametric tests which are comparable to the ANOVA, the Wilcoxon Signed Rank Test has been used to explore the within-subject differences (group changes over time) and the Mann-Whitney U test has been used to explore between-group differences (at pre-intervention and post-intervention). As a low number of parents completed post-intervention questionnaires, this data were not suitable for statistical analysis. This data has been briefly discussed in Section 5.8.

5.2.3 Null Hypothesis Significance Testing

Statistical testing calculates the probability of obtaining differences between groups, assuming the null hypothesis were true. If the probability is small enough

($p<0.05$), it suggests that the difference was due to the manipulation of the independent variable and is unlikely to have arisen by chance (Dancey & Reidy, 2014). The null hypothesis is therefore rejected.

5.2.4 Errors

When statistical tests are utilised there is always the possibility of making errors (Pallant, 2013): type 1 error (rejection of the null hypothesis when it is in fact true); and type 2 error (failure to reject the null hypothesis when it is in fact false). The probability of making a type 1 error (alpha – α) is conventionally set at .05 (Finkel, Eastwick, & Reis, 2015).

Pallant (2013) notes that when there are large numbers of comparisons within the data set the chance of making a type 1 error increases. To control for this, a more stringent α level can be applied, by dividing α (.05) by the intended number of comparisons that are made. As there are a number of hypotheses being tested in the current research, applying this control would significantly lower α and increase the possibility of a type 2 error. Therefore, α has been maintained at .05, as the small sample and low statistical power will likely counteract the chances of making a type 1 error.

5.2.5 Effect Size

Should statistically significant differences be found between groups, it is necessary to establish the degree to which these differ (Pallant, 2013) through calculation of the effect size. Effect sizes are most commonly generated using Cohen's *d* (Cohen 1988), which utilises standard deviation units to show the differences between groups. However, this should only be applied to data sets which are normally distributed (Howell, 2013; Pallant, 2013). Pallant (2013) suggests that when using the Wilcoxon Signed Rank Test and the Mann-Whitney U Test, effect sizes can be calculated by dividing the *Z* value by the square root of *N* (*N*=the number of cases

over the two time points). It should be noted that effect sizes have not been calculated in the current study due to the nature of the outcomes generated.

5.2.6 Statistical Power in the Current Study

Statistical power calculations are typically calculated prior to conducting research, and are based on estimates of means, variances, correlations and proportions (Howell, 2013). This provides an indication of the sample size needed to generate higher levels of statistical power. As the current research utilised a readily-available sample, priori power analysis in order to determine the sample size was not possible. Statistical power can be calculated post hoc (Howell, 2013), by considering the significance level set (α), sample size, and effect size (Cashen & Geiger, 2004; Pallant, 2013), although, this should not be used to explain the obtained outcomes (Howell, 2013).

Post hoc power analysis requires the calculation of effect size, commonly Cohen's *d* (Howell, 2013), which was not possible in the current research, as such, statistical power was not calculated. However, it is recognised that the current study has lower power due to the small sample size and use of non-parametric tests.

5.2.7 Treatment of Raw Data

The responses gained for each questionnaire were transferred to Microsoft Word® 2010 versions of the questionnaires. The total scores for each scale were calculated for each child and entered into a data table (See Appendix 17). The raw data was then inserted into IBM® SPSS® Statistics Version 24 for statistical analysis. The results of this analysis have been detailed below.

5.3 Data Analysis for Research Question 1

Research Question 1: Does participation in Forest School have an impact upon the attachment/relationships of nursery aged children?

Null Hypothesis: Following the Forest School intervention, there will be no statistically significant group differences in changes in participants' attachment/relationships scores as measured by the DECA-P2.

5.3.1 Descriptive Statistics

The descriptive statistics indicate an increase in attachment/relationships scores from Time 1 (T1: pre-intervention) to Time 2 (T2: post-intervention), in both the experimental and control group (See Table 5.2).

Table 5.2: Medians and ranges for attachment/relationships scores in the experimental and control groups

	Pre-Intervention		**Post-Intervention**	
	Median	Range	Median	Range
Experimental	23	13	27	11
Control	25	15	31	17

5.3.2 Inferential Statistics

Analysis of within-group differences, using the Wilcoxon Signed-Rank Test, revealed that there were statistically significant differences in attachment/relationships scores between T1 and T2 in both the experimental (Z=2.82 *p*=.005) and control group (*Z*=2.61 *p*=.009).

The Mann-Whitney U test indicated that there were no statistically significant between-group differences in attachment/relationships scores at T1 (*U*= 46.5 *p*=.355) and at T2 (*U*=32.0 *p*=.058).

5.3.3 Summary

The results suggest that at the beginning of the study the groups did not differ in their attachment/relationships scores, nor did they differ at the end of the study.

It appears, however, that both control and experimental groups made significant gains in their attachment/relationships scores, as perceived by the Head Teacher.

5.4 Data Analysis for Research Question 2

Research Question 2: Does participation in Forest School have an impact upon the self-regulation of nursery aged children?

Null Hypothesis: Following the Forest School intervention, there will be no statistically significant group differences in changes in participants' self-regulation scores as measured by the DECA-P2.

5.4.1 Descriptive Statistics

The descriptive statistics indicate a small increase in self-regulation scores from T1 to T2, in both the experimental and control group (See Table 5.3).

Table 5.3: Medians and ranges for self-regulation scores in the experimental and control groups

	Pre-Intervention		**Post-Intervention**	
	Median	Range	Median	Range
Experimental	24	22	25	20
Control	23	19	24	18

5.4.2 Inferential Statistics

The Wilcoxon Signed-Rank Test was used to analyse within-group differences. This revealed that there were no statistically significant differences in self-regulation scores between T1 and T2 in both the experimental (Z=1.48 p=.138) and control group (Z=1.63 p=.102).

There were no statistically significant between-group differences in self-regulation scores at T1 (U=56.5 p=.792) and at T2 (U=56.0 p=.767), as indicated by the Mann-Whitney U test.

5.4.3 Summary

The data indicates that at the beginning of the study, self-regulation scores did not differ between the control group and the experimental group and no difference was detected following the Forest School intervention.

There were no significant post-intervention changes in self-regulation scores for either groups. As such, the null hypothesis cannot be rejected.

5.5 Data Analysis for Research Question 3

Research Question 3: Does participation in Forest School have an impact on the initiative of nursery aged children?

Null Hypothesis: Following the Forest School intervention, there will be no statistically significant group differences in changes in participants' initiative scores as measured by the DECA-P2.

5.5.1 Descriptive Statistics

The descriptive statistics indicate an increase in initiative scores from T1 to T2 in both the experimental and control group (See Table 5.4).

Table 5.4: Medians and ranges for initiative scores in the experimental and control groups

	Pre-Intervention		**Post-Intervention**	
	Median	Range	Median	Range
Experimental	21	14	26	13
Control	20	12	29	16

5.5.2 Inferential Statistics

Analysis of within-group differences, using the Wilcoxon Signed-Rank Test, showed that there were statistically significant differences in initiative scores between T1 and T2 in both the experimental (Z=2.41 p=.016) and control group (Z=2.63 p=.009).

There were no statistically significant between-group differences in initiative scores at T1 (U=58.0 p=.869) and at T2 (U=40.5 p=.187), as revealed by the Mann-Whitney U test.

5.5.3 Summary

As with the scores on the previous measures, the pre-intervention scores for initiative were not significantly different between the experimental group and control group. The post-intervention scores were also not significantly different.

Both the groups appeared to have made significant gains in initiative scores following the intervention period. In summary, the null hypothesis cannot be rejected.

5.6 Data Analysis for Research Question 4

Research Question 4: Does participation in Forest School have an impact upon the overall social and emotional well-being of nursery aged children?

Null Hypothesis: Following the Forest School intervention, there will be no statistically significant group differences in changes in participants' overall social and emotional well-being scores as measured by the DECA-P2.

5.6.1 Descriptive Statistics

The descriptive statistics indicate an increase in overall social and emotional well-being scores from T1 to T2, in both the experimental and control group (See Table 5.5).

Table 5.5: Medians and ranges for overall social and emotional well-being scores in the experimental and control groups

	Pre-Intervention		**Post-Intervention**	
	Median	Range	Median	Range
Experimental	69	40	76	32
Control	71	39	83	48

5.6.2 Inferential Statistics

It was revealed, using the Wilcoxon Signed-Rank Test, that there were statistically significant differences in overall social and emotional well-being scores between T1 and T2 in both the experimental (Z=2.49 p=.013) and control group (Z=2.49 p=.013).

The Mann-Whitney U test indicated that there were no statistically significant between-group differences in overall social and emotional well-being scores at T1 (U=51.0 p=.532) and at T2 (U=42.0 p=.224).

5.6.3 Summary

The results suggest that the groups did not differ significantly in their pre-intervention overall social and emotional well-being scores. Both the experimental and control group made significant gains in their social and emotional well-being scores, from pre-intervention to post-intervention. Interestingly, the descriptive statistics suggest that the control group made greater gains in social and emotional well-being over this period. However, the groups did not significantly differ in their post-intervention scores. Therefore, any gains in the experimental group cannot be associated with the implementation of Forest School.

5.7 Data Analysis for Research Question 5

Research Question 5: Does participation in Forest School have an impact upon the communication skills of nursery aged children?

Null Hypothesis: Following the Forest School intervention, there will be no statistically significant group differences in changes in participants' communication scores as measured by the FOCUS-34.

5.7.1 Descriptive Statistics

The descriptive statistics indicate an increase in communication scores from T1 to T2, in both the experimental and control group (See Table 5.6).

Table 5.6: Medians and ranges for communication scores in the experimental and control groups

	Pre-Intervention		**Post-Intervention**	
	Median	Range	Median	Range
Experimental	158	142	206	73
Control	138	133	214	93

5.7.2 Inferential Statistics

The Wilcoxon Signed-Rank Test was used to analyse within-group differences. This indicated that there were statistically significant differences in communication scores between T1 and T2 in both the experimental (Z=2.49 p=.013) and control group (Z=2.85 p=.004).

There were no statistically significant between-group differences in communication scores at T1 (U=52.0 p=.577) and at T2 (U=54.5 p=.694), as revealed by the Mann-Whitney U test.

5.7.3 Summary

The data suggests that both the control group and experimental group made significant gains in their communication scores from pre-intervention to post-intervention. The groups did not significantly differ in their communication scores at the beginning of the study. The descriptive statistics appear to highlight greater gains in communication scores for the control group, however, this was not statistically significant.

5.8 Parental Raw Data

An inspection of the raw parental data (See Appendix 17) revealed differences between the Head Teacher data and parent data. Children that received high scores at T1 from the Head Teacher, generally received similar parental scores at T1. However, children that received lower scores at T1 from the Head Teacher were, on the most part, given significantly higher scores at T1 by their parents. Overall, the parents scores at pre-intervention were high. This perhaps indicates some level of bias from parents, as it was expected that there would be a diverse range of scores, given the Head Teacher data, staff reports on the range of needs/diversity within the nursery and the Ofsted information on the pupil demographics. Had there been enough parent data at post-intervention to

analyse, it is likely that it would have been difficult to detect any significant differences due to the high pre-intervention scores.

6 Qualitative Research Element

6.1 Introduction

The following section explores the qualitative research element. As noted in Chapter 2, outdoor learning has been linked with constructivist pedagogy (O'Brien & Murray, 2007; Seyfried, 2002). Therefore, case studies have been included for illustrative purposes to highlight some of the individual experiences of Forest School.

This chapter begins by exploring the design and procedure used in gaining the case study data, followed by consideration of issues related to validity and reliability of qualitative research. Activity theory is then discussed and justified as an analysis tool in the current study.

6.2 Design

Case study data has been generated for three participants in the experimental group. Data was gathered through interviews with a FSL pre- and post- the Forest School 10-week cycle, and weekly diary entries from two FSLs. The data was transcribed and Engeström's (1999) second generation activity theory model was used to generate coding themes. These codes were used to deductively analyse the case study data.

It has been argued that there are no set methods regarding how a case study can be utilised (Longhofer, Floersch, & Hartmann, 2017). Case study research methods have been considered most useful for generating hypotheses and discovering the research context, but not for 'justification', as case studies lack randomisation and the control of variables (Luyten, Corveleyn, & Blatt, 2006). However, Koenig (2009) argues that case studies can expand the understanding of causality of outcomes

in evaluation research. The case studies in the current study have been undertaken to illustrate the Forest school at Maplefield Nursery and expand the understanding of the quantitative data.

6.3 Participants

6.3.1 Selection of Participants

During the initial stages of the research the FSLs were asked to choose three children from the experimental group, whom they felt would represent the differences within the nursery population. Case study data was gained for these three children.

6.3.2 Description of Participants

6.3.2(i) Children

The illustrative case studies in Chapter 7 provide information on each child's social and emotional well-being and communication prior to the Forest School programme starting.

6.3.2(ii) Nursery Staff

Two FSLs, Lizzie and Lucy[8], provided the case study data. Both FSLs contributed to writing the diaries each week. Lizzie completed the interviews pre- and post- the Forest School 10-week cycle.

[8] Names have been changed to protect participant anonymity

Lucy has been trained in Forest School at Level 3 for approximately 5 years. She has worked at Maplefield Nursery for 10 years and is trained as a nursery nurse.

Lizzie was the first staff member at Maplefield Nursery to be trained as a Forest School Leader. She has worked at Maplefield Nursery for 15 years and is a trained teacher.

6.4 Procedure

6.4.1 Intervention

The three children received the Forest School intervention as described in Chapter 4. The attendance of the children to the Forest School sessions is described in the illustrative case studies.

6.4.2 Data Gathering Tools

6.4.2(i) Interviews

Pre- and post-intervention semi-structured interviews were developed to seek information regarding the three case studies. The interview questions/topics (See Appendix 18) were created based on the outcome measures chosen during the focus group. Previous research on Forest School has generally developed themes from open-ended interview questions, concluding a wide range of positive outcomes. In the current study, the aim was to generate qualitative data which could be easily linked to the research questions. This was not considered deterministic or subjective on the part of the researcher, given that these outcomes were developed with the FSLs themselves.

The pre-intervention interviews were undertaken with Lizzie on the 28 September 2017[9], to gain an understanding of the children's social and emotional well-being and communication skills, prior to the Forest School starting. The post-intervention interviews were completed with Lizzie on the 12 December 2017, to gain an understanding of how Forest School had impacted the children in these areas, which in turn, contributed to the activity triangles (See Chapter 7).

The interviews took place for 30 minutes in a quiet room at the nursery. The interviews were audio recorded and transcribed using an adapted version of the Notation System (See Appendix 19) as presented in Braun and Clarke (2013).

6.4.2(ii) Diaries

During the pilot study, the initial instruction was to write down anything about the session felt to be important or meaningful. However, one participant reported finding this difficult: she was unsure of what she should write and felt it took too much time. It was therefore decided that a focused diary (See Appendix 20) would be beneficial, specifically considering the outcome areas chosen for the research (social and emotional well-being and communication), focussing more so on the case study children.

Given the supplementary nature of this element of the research, the FSLs were instructed to answer only the questions they felt necessary and in any format they wanted to. The two FSLs completed the diaries together following each session.

6.5 Validity and Reliability

Guba and Lincoln (1989) argue that the 'goodness' criteria (i.e. validity and reliability), associated with the positivist paradigm, cannot be applied to

[9] It was not possible to complete this interview prior to Forest School starting as intended, however, as it followed the first session by only three days, this was deemed acceptable.

constructivist studies. Therefore, they developed criteria for appraising qualitative research. Mertens (1998) provides a comprehensive overview of these criteria, highlighting the comparability of internal validity to 'credibility' and external validity to 'transferability'. Further constructivist terms, 'dependability' and 'confirmability' have been likened to positivist terms reliability and objectivity, respectively.

6.5.1 Credibility

Guba and Lincoln (1989) define credibility as "establishing the match between constructed realities of respondents (or stakeholders) and those realities as represented by the evaluator and attributed to various stakeholders" (p. 237). Table 6.1 highlights how credibility can be increased in qualitative studies (Guba & Lincoln, 1989) and how these were applied in the current study.

Table 6.1: Techniques used to increase credibility in the current study

Technique	Brief Description	Application in current study
Prolonged Engagement and Persistent Observation	Considerable time is spent at the research site to identify the most relevant issues and minimise the likelihood of misinformation and "to establish the rapport and build the trust necessary to uncover constructions" (Guba & Lincoln, 1989, p. 237).	Many visits were made to the research site (Maplefield Nursery) before, during and after the Forest School intervention. The researcher also actively engaged in Forest School sessions prior to the undertaking of the research[10].
Negative Case Analysis	Cases that do not fit the working hypotheses are analysed to ascertain whether reasonable numbers of participants provide the same conclusions.	Case study data was only collected for children in the experimental group due to time constraints. However, control group data was gathered in the quasi-experimental element of the research.
Progressive Subjectivity and Peer Debriefing	Researcher constructs are monitored throughout the study and reflected upon. Peer debriefing has been suggested to support this	Reflections were made throughout the research regarding the constructions of the researcher. The findings and analysis

[10] These visits were undertaken prior to the pilot study and main study. None of the children included in the current study were involved in these visits.

	(Mertens, 1998), whereby discussions are had with a peer regarding the analysis, findings and conclusions.	of the various data sources were shared and discussed with a peer.
Member Checks	Constructions and interpretations from the data collected are checked by participants.	The analysis and findings were shown to the two FSLs that contributed to data collection. The FSLs were encouraged to provide their thoughts.
Triangulation	Data is checked and compared to different sources of data.	Case study data was generated through diaries and interviews. This data was also triangulated with the primary research element; the quantitative data.

6.5.2 Transferability

Transferability is regarded the qualitative equivalent of external validity (Guba & Lincoln, 1989), however, it is the reader that measures the degree of transferability from the research site to other contexts and situations (Mertens, 1998). The researcher must ensure that enough information is provided to the reader to enable transferability to be considered, a term labelled 'thick description'.

In order to enable readers to make transferability judgements of the current study, the researcher has provided detailed information regarding Maplefield Nursery and the Forest School intervention (See Chapter 4). In addition, multiple case studies have been analysed and described, using various data sources to also support this judgement.

6.5.3 Dependability and Confirmability

Dependability refers to the stability of the data over time, likened to reliability in quantitative studies (Guba & Lincoln, 1989). The constructivist position is that changes in research design are expected and necessary in successful research. However, these changes should be tracked and available to readers through transparent reporting of the process, the decision making of the researcher and important contextual influences (Guba & Lincoln, 1989).

Guba and Lincoln (1989) liken confirmability to the term objectivity: "like objectivity, confirmability is concerned with assuring that data, interpretations, and outcomes of inquiries are rooted in contexts and persons apart from the evaluator and are not simply figments of the evaluator's imagination" (p. 242-243).

It is suggested that the integrity of the findings is embedded in the data (Guba & Lincoln, 1989). Data should be trackable to their sources and case study narratives

should explicitly and implicitly highlight the reasoning used to construct the interpretations (Guba & Lincoln, 1989).

In the current research the qualitative aspects of the study have been fully documented: the focus group undertaken in the initial stages of the research followed a specific structure (See Appendix 7); the diaries written by FSLs were written to set questions (See Appendix 20); and the interviews were semi-structured, following the same script (See Appendix 18). The chain of data is also evidenced by providing an example of the activity theory process, including the raw data, coding and activity triangles.

6.6 Theoretical Approach to Data Analysis

6.6.1 Activity Theory

As previously noted, Forest School has been associated with constructivist pedagogy (Knight, 2018; Leather, 2018; O'Brien & Murray, 2007; Seyfried, 2002). It has been argued that the assumptions of activity theory are compatible with constructivism (Jonassen & Rohrer-Murphy, 1999), perhaps due to the socio-cultural positioning of activity theory and its emphasis on humans within their social environment. Furthermore, Forest School has been linked to Vygotskian social development theory, the concept of meditation and the ZPD. The ZPD has been suggested as a general principle of activity theory (Kuutti & Engeström, 2006) and the work of Vygotsky, in particular the concept of 'mediation', heavily influenced the development of activity theory.

Activity theory centres on "the relation and interaction between humans and their material and social environment" (Kuutti & Engeström, 2006, p. 44). Activity theory, also known as cultural historical activity theory (CHAT), is a theoretical framework founded by psychologists Lev Vygotsky, Alexander Luria and Alexei

Leont'ev (Kuutti & Engeström, 2006; Nussbaumer, 2012). 'Activities' are described as "purposeful, social system of actions" (Kuutti & Engeström, 2006, p. 44), whereby a 'subject' is working to achieve a specific 'object' (i.e. specific focus of the activity). Activity theorists utilise activity triangles in visually portraying the relevant nodes of an activity (Roth & Lee, 2007) .

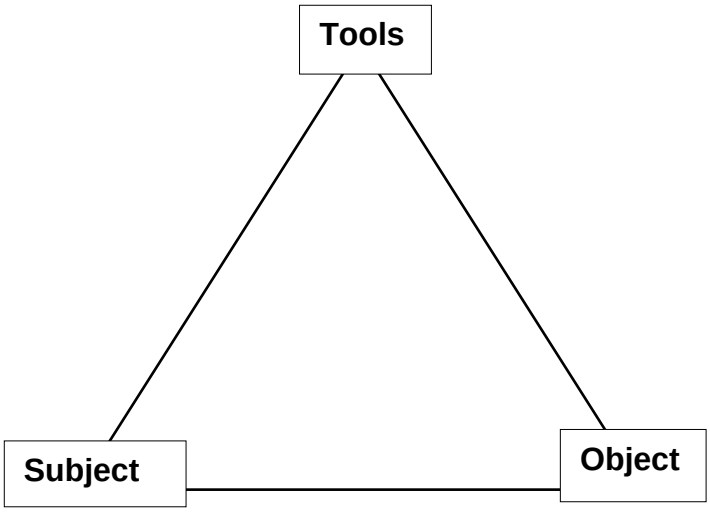


Figure 6.1: First generation activity theory

The first generation of activity theory (See Figure 6.1), included the concept of mediation, whereby Vygotsky proposed that humans act upon mediating artefacts within the environment, such as tools and signs (Nussbaumer, 2012). The concept of tool mediation is one of the fundamental features of activity theory (Kuutti & Engeström, 2006). Language is considered an essential tool, particularly as it is suggested to mediate cognitive development (Vygotsky, 1978).

The second generation of activity theory (See Figure 6.2) was later developed by Yrjo Engeström (Engeström, 1999), whereby wider socio-cultural considerations were added.

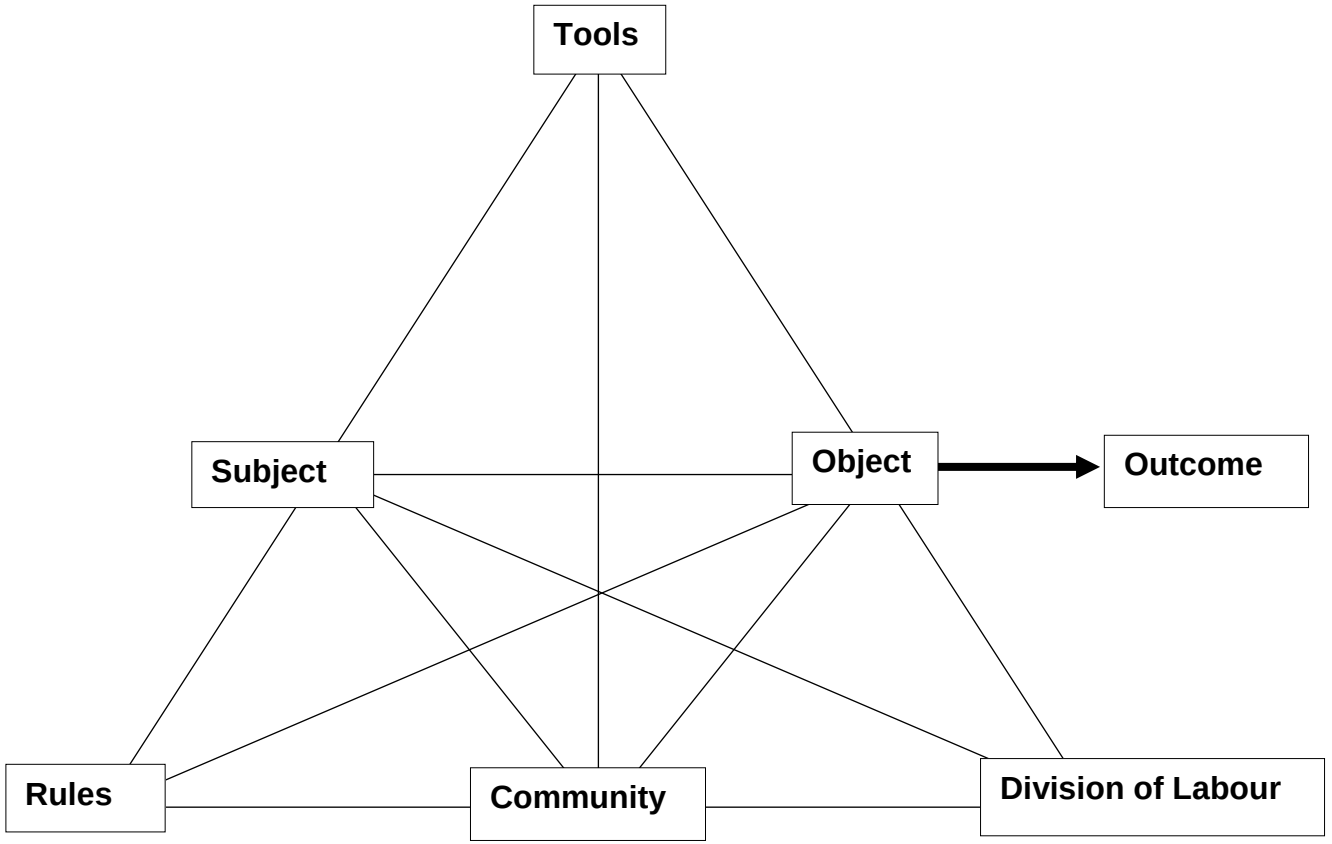


Figure 6.2: Second generation activity theory (Engeström, 1999)

The first generation was expanded to include the 'community' that are involved in the activity and two new mediational relationships: 'rules', which impact on how the individual and community act upon the object; and 'division of labour', relating to how the action is divided between those in the community (Kuutti & Engeström, 2006). Table 6.2 provides a description of each node of the activity triangle.

Table 6.2: Description of nodes within an activity system (adapted from Leadbetter, 2008)

Nodes	Description
Subject	The perspective being considered in the activity triangle i.e. the Forest School leaders.
Object	What is being completed/worked upon in order to achieve a desired outcome i.e. engagement in Forest School.
Tools	Physical or conceptual tools which are used to act upon the activity/object. NB. Typically when using activity theory it is considered how the subject uses tools to influence the object, however, due to the case study nature of the activity triangles, in the current research the tools were related to the individual children considered within the objects (e.g. Maisie's use of tools when engaging in Forest School).
Rules	Rules that constrains or supports the activity.
Community	Others that are involved in the activity.
Division of Labour	The task allocation for individuals within the system. What is done and by whom.
Outcomes	Outcomes that have been achieved due to the object and the mediating factors i.e. outcomes of engaging in Forest School.

This was expanded further into a third generation model (Engeström, 1999), whereby networks of interacting systems are considered (Nussbaumer, 2012). New forms of activity can be generated by finding solutions to contradictions within the activities (Kuutti & Engeström, 2006).

The use of activity theory in research has increased over the last two decades, as it is "adaptable and applicable to many disciplines" (Nussbaumer, 2012, p 37). Examples of its use include research on teaching and learning (Nussbaumber, 2012), and social exclusion in complex situations (Edwards & Fox, 2005). The utility of activity theory has also been advocated in the Educational Psychology profession, such as for understanding multi-agency working (Greenhouse, 2013) and as a framework for engaging in consultations with teachers (Leadbetter, 2005).

Activity theory was used in the current research as it provides a framework for considering sociocultural aspects of an activity whilst also considering the individual within the system (Leadbetter, 2005).

6.6.2 Application of Activity Theory in the Current Study

Thematic analysis was used, through the application of activity theory, to analyse the Forest School activities experienced by three children (based on the perspective of FSLs).

Thematic analysis is a method used to identify, analyse and report patterns within qualitative data (Braun & Clarke, 2006). It is suggested that thematic analysis "offers an accessible and theoretically-flexible approach to analysing qualitative data" (Braun & Clark, 2006, p. 2). Braun and Clarke (2006) highlight that thematic analysis is different to other qualitative analysis procedures, such as grounded theory or IPA (interpretative phenomenological analysis), as it does not hold any pre-existing theoretical framework, and as such, can be used with various theoretical frameworks. A 6-step approach to thematic analysis was developed by

Braun and Clarke (2006). This approach is highlighted in the following section, including how the analysis was undertaken in the current research (See Table 6.3).

Activity theory was chosen as a post-hoc theoretical framework, due to its theoretical links to Forest School, and because it provided an interesting and unique approach to presenting case studies within the Forest School literature. The data collection was purposefully focussed around outcomes related to social and emotional well-being and communication. The 'subject' of each activity triangle is the two FSLs involved in the data collection. The 'object' is each child's participation in Forest School. Contradictions were not explored in the analysis process, as there was no aim to generate change within the activities.

It is recognised that in applying a deductive thematic analysis procedure in this way, the researcher should be mindful of researcher-bias. A brief discussion regarding the researcher's reflections on the qualitative data analysis is therefore provided (See Section 7.5).

6.6.2(i) Data Analysis Procedure

Table 6.3: The phases of thematic analysis (Braun and Clark, 2006) and how these were applied in the research

Phase 1: Familiarising yourself with your data	The researcher became immersed in the data by listening to the interview extracts. The interviews were then transcribed (See Appendix 21 for transcription example[11]). The diary entries were read.
Phase 2: Generating Initial Codes	The nodes of the activity triangle were assigned a colour (tools – pink, rules – green, community – yellow, division of labour – red, outcomes – blue), and each node of the triangle was analysed against the transcriptions separately, due to some of the interview extracts being applicable to more than one node (e.g. 'friends' at Forest School could be considered a tool and community). Data which were indicative of a node of the activity triangle were highlighted in the assigned colour. The different nodes were colour coded for each diary entry (See Appendix 22 for example).
Phase 3: Searching for Themes	Extracts that were repetitions of the same concept or common themes were grouped and labelled (See Appendix 23). The interview data and diaries were not combined, as the diary data relates to the activities *during* Forest School, whereas the interview data considers the activities *after* the 10-week cycle of Forest School. The diary data is colour coded as *orange* on the thematic maps (activity triangles).

[11]The full interview transcription and analysis process have been provided for one child (Maisie), as an example, including the extracts associated with each node.

Phase 4: Reviewing Themes	Themes were reviewed and grouped into thematic maps for each child (See Figures 7.1, 7.2 and 7.3 for final thematic maps)
Phase 5: Defining and Naming Themes	Themes were refined and transferred to tables, accompanied by the corresponding extracts (See Appendix 24). In order to prevent the researcher manipulating the data or adding subjectivity to these themes, the themes were generally shortened versions of the extracts. The thematic maps (activity triangles) were refined and updated.
Phase 6: Producing the Report	See Chapter 7

It should be noted that the case study analysis was undertaken by a single researcher, and although peer debriefing and member checking occurred, this should be taken into account when interpreting the analysis.

7 Case Studies

7.1 Introduction

The following section presents information about each child prior to starting Forest School, in relation to the chosen research outcomes. This information was generated through the pre-intervention interviews. The activity triangles for each case study are presented, developed through analysis of the post-intervention interviews and diary entries. A brief summary of each node of the triangle is then provided. As the 'outcome' element of the activity triangle relates specifically to the research questions of the current study, this node of the triangle has been discussed in more detail. See Appendix 25 for a further discussion of the additional nodes of the activity triangles.

7.2 Case Study 1

7.2.1 Child Profile

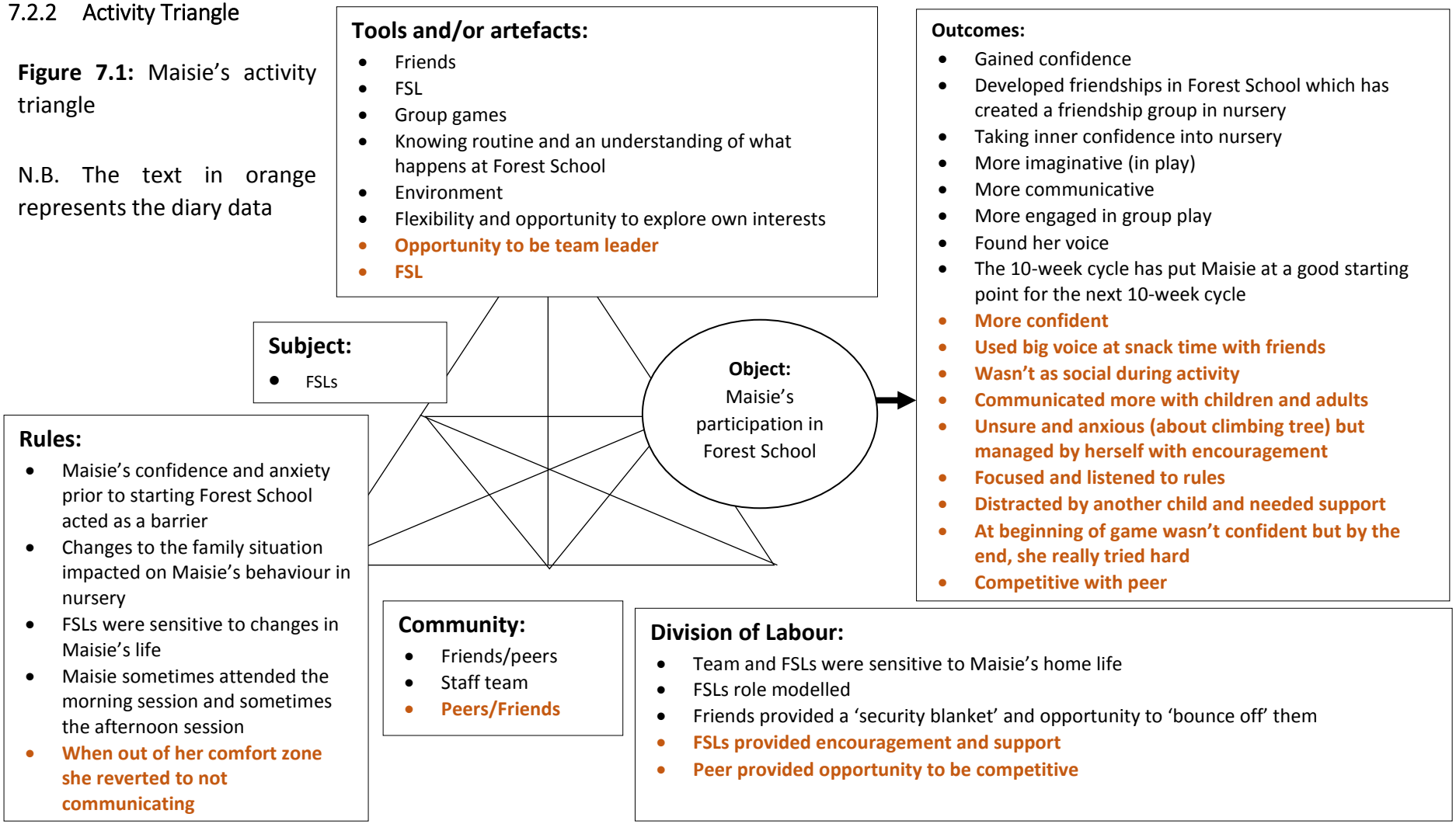
Table 7.1: Maisie prior to starting Forest School

Maisie	
Age:	3 years 10 months
Gender:	Female
Upon first starting nursery: She was incredibly shy and upset, and her involvement and levels of well-being (Leuven Scales) were really low. She was unable to motivate herself and needed lots of support. In her second term she started to find more confidence and began interacting more and started to join in with group play.	
Social and emotional well-being: • She had an unsureness about her and was a little self-conscious • She found it difficult to engage and would observe and wait to be invited • She did not have a specific friend and was happy to play alongside other children • She moved into a bigger group for group time, so became a bit more comfortable in bigger groups	
Communication skills: • She would chat and engage in communication**, w**hen she was comfortable • She would engage in a two-way conversation, with prompting, if she was relaxed • She needed more prompting when she was unsure of herself • Sometimes she did not want to share information at all • Her clarity of language was clear • Her listening, attention and understanding of language was good	
Additional information: • At home Maisie was different, she was outgoing and noisy. Nursery is much busier, which appeared to overwhelm Maisie • After the summer holidays, she went back to being unsure again • Her strengths showed more outside, she appeared more confident and comfortable to engage outside, and joined in with small games outside (e.g. football), which she did not do inside	

7.2.2 Activity Triangle

Figure 7.1: Maisie's activity triangle

N.B. The text in orange represents the diary data



7.2.2(i) Tools

A tool which mediated Maisie's experience was her Friends, as they explored with her and supported her. Maisie also used the skills of the FSLs whilst engaging in Forest School, such as role-modelling and encouragement. Another mediating tool, specific to the forest school sessions, was access to the environment, as the natural resources encouraged Maisie to be creative. Further tools which impacted Maisie's experience was the access to group games and the flexibility of the sessions, which allowed Maisie to explore her own interests. Maisie's knowledge of the routine of the sessions mediated her experience by helping her to develop in both the groups she participated in. The opportunity for Maisie to be team leader mediated her experience by supporting her growing confidence.

7.2.2(ii)Rules

Masie's confidence before starting Forest School acted as a constraint to her Forest School activity; she was very quiet and would seem unsure about things, which initially acted as a barrier that she found hard to overcome. Maisie experienced some changes to her family dynamic during the research period, which exacerbated her anxiety and had an impact on her behaviour in nursery. However, the FSLs supported Maisie's Forest School experience by making sure they were sensitive to the changes in Maisie's life and by being mindful of what Maisie was bringing with her into nursery. One of the main constraints for Maisie's Forest School experience was that she attended different sessions each week, sometimes attending the morning session, but then sometimes attending the afternoon session. This impacted on the stability of having the same group, however, due to the session structures being similar, she was able to develop in both groups and relax into Forest Schools. When Maisie was out of her comfort zone she stopped communicating, which may have acted as a constraint in the sessions.

7.2.2(iii) Community

Others involved in Maisie's Forest School experience were Maisie's friends/peers and the FSLs.

7.2.2(iv) Division of Labour

Those involved in Maisie's Forest School experience contributed to her experience in different ways. The staff team and FSLs made sure they were sensitive to Maisie's home life and the added anxiety she may have been feeling. The FSLs also role modelled activities for Maisie and provided encouragement and support to Maisie. Maisie's friends provided a 'security blanket' for Maisie and the opportunity to 'bounce off' them. Maisie's peers also provided the opportunity for Maisie to be competitive.

7.2.2(v)Outcomes

There were a number of outcomes identified from both the interview and diary data. In the interview it was reported that Maisie had gained confidence in a number of areas: "social interaction"; "to have a go"; "to engage in play"; "to communicate more"; and "to bring skills out". It was also reported that Maisie was beginning to take this inner confidence that was developing in Forest Schools, into nursery. She was starting to engage in nursery activities and getting involved, which she had not done before. Maisie developed friendships in both the morning session of Forest School and the afternoon session, which "created a little friendship group for her that you can see playing out really nicely in nursery". Maisie also became more imaginative and more communicative. She "found her voice", was able to engage in a shared discussion and was communicating more with friends, which again, had been taken into nursery. Maisie began engaging more in group play: "she will more happily and confidently have a go"; "you can see her engaging in play and actually taking a more proactive part in group social play"; "she's definitely got more of a voice in small group play". It was also

highlighted that the 10-week cycle had put her at a good starting point for the next cycle of Forest School.

In the diary entries it was also noted that Maisie had become more confident. In the 3 October diary it was reported that Maisie "used her big voice at snack time to talk to friends". On the 17 October diary, it was reported that Maisie was communicating more with children and adults; she used a louder "big" voice with friends and used language independently, asking adults questions when she needed help. On 31 October, Maisie was "very focused" and "listened to the safety rules adapting her skills to keep her safe", and on the 21 November, Maisie was competitive with Tyler when helping with fire building.

In the 3 October diary, it was reported that Maisie "wasn't as social this week during activity" and on the 7 November Maisie "needed drawing in a bit as distracted by another child". On the 17 October Maisie was unsure and anxious about climbing a tree, however, she managed to do this by herself, with encouragement. On the 14 November, Maisie "wasn't very confident and didn't join in" with a bear hunt game, but by the end of it she "really tried hard".

Table 7.2: Quantitative outcomes for Maisie as identified by staff questionnaire

Measure	Pre-Intervention	Post-Intervention
Social and emotional well-being	60	69
Communication	116	164
Attachment/relationships	18	22
Self-Regulation	24	27
Initiative	18	20

7.2.3 Summary

It appears that Maisie's levels of confidence and anxiety prior to starting Forest School had an impact on her initial engagement. There were a number of references to Maisie's development of friendships and the support these provided her in the Forest School sessions. This is interesting given that Maisie reportedly did not have specific friends prior to Forest School starting. It was noted that

Maisie utilised the FSLs as a tool whilst engaging in Forest School. Maisie had the most number of reported outcomes, compared with Tyler and Sam, and she was the only child whereby some of these outcomes were noticed in the wider nursery environment. Maisie's Forest School experience was different to her peers, as she did not always attend the same session (i.e. morning or afternoon), which impacted on the stability of the Forest School process. However, as the process was similar, she developed in both groups, perhaps also providing her the opportunity to engage with more peers.

7.3 Case Study 2

7.3.1 Child Profile

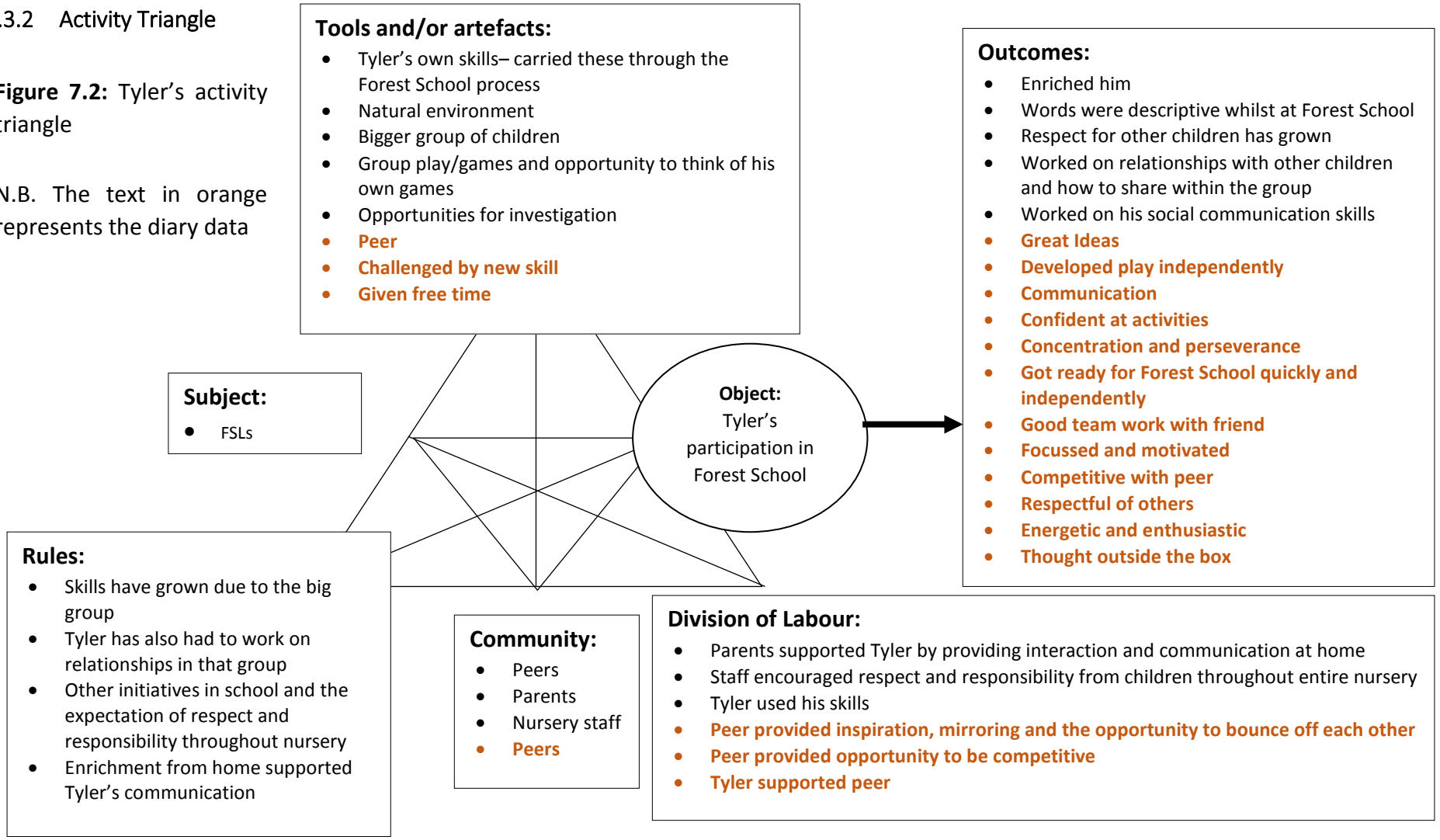
Table 7.3: Tyler prior to starting Forest School

Tyler	
Age:	3 years 10 months
Gender:	Male
Tyler upon first starting nursery: He was quieter, as it might have been overwhelming. He was fine once he was drawn into activities and became much more confident.	
Social and emotional well-being: • His emotional well-being was ok • He was quietly confident and was confident to engage in a way that he was happy with • He liked to play alongside but he was also very aware of the other children around him • He would sometimes play together with other children, but he could also get focussed in what he was doing and liked his own space • He was kind, respectful and empathic with other children around him • He appeared to genuinely like the other children	
Communication skills: • He had good language skills • He liked to share his knowledge with others and would relay what he had been doing	
Additional information: • He was very knowledgeable, he had a lot of knowledge to give • He was good at thinking things through • Nothing phased him; he was always happy to try new initiatives and have a go • He liked being outside	

7.3.2 Activity Triangle

Figure 7.2: Tyler's activity triangle

N.B. The text in orange represents the diary data



7.3.2(i) Tools

Tyler used his own skills to mediate his Forest School experience. These were skills he already had prior to engaging in Forest School and carried them through the whole process, such as his communication skills, team skills, social skills, emotional well-being and enthusiasm. The natural environment was also a tool for Tyler, by providing natural wonder. The bigger group of children, the group games and opportunities for group play also had a mediating influence on Tyler's Forest School experience. Tyler also had the opportunity to think of his own games, which other children joined in with. The opportunity for investigation was a tool of Tyler's Forest School experience, as it encouraged him to ask questions and be curious. Some of Tyler's peers also mediated the Forest School sessions, as they provided inspiration and mirroring opportunities. The challenge of learning new skills supported Tyler's experience, as did the opportunity to have free time during the sessions.

7.3.2(ii) Rules

An element of Tyler's Forest School experience which supported his skill development was the bigger group, however, this could also have been a constraint, as Tyler had to learn how to negotiate his role in the bigger group. Tyler was very confident at the beginning and would share his views a lot, but others in the group also wanted to share, thus, Tyler had to work on relationships within the group to allow others to have a voice. Tyler's Forest School activity was supported by other initiatives in the nursery and the expectation that all the children show respect and responsibility, which Tyler brought into the Forest School environment. Tyler's Forest School experience was also supported through the communication enrichment provided at home.

7.3.2(iii) Community

Tyler's peers and parents were both noted as being a part of Tyler's Forest School experience, as were the nursery staff.

7.3.2(iv) Division of Labour

Tyler's parents influenced his Forest School experience by providing communication enrichment at home, through verbal interactions. The staff ensured that the children showed respect and responsibility in the nursery, which Tyler had taken into the Forest School sessions. Tyler was responsible for utilising his own skills during the sessions and providing support to his peers. Tyler's peers provided inspiration, mirroring and the opportunity for Tyler to be competitive.

7.3.2(v) Outcomes

It was reported that although Tyler came to the Forest School process "confidently emotionally" the things he engaged in at Forest School "have just enriched that for him" and "he's going into the next session of Forest Schools in the same place, if not more enriched and better really". It was also reported that Tyler's language at forest school was "really descriptive". In the 3 October diary it was recorded that Tyler said "it's stable now", which surprised the FSLs and on the 28 November Tyler "sequenced and retold the stickman story with confidence and brilliant sequencing skills". It was suggested that Tyler had to work on a relationship with another child within the group in order to be able to share his views, but also let the other boy share. His respect for other children grew, which was reported in both the interview and the 28 November diary. He also worked on his social communication skills, as he had lots of things to say.

It was noted in the 3 October and 7 November diaries that Tyler had "great ideas" and communicated them to others. He also developed his play independently. On 17 October Tyler was confident at a number of the activities and on the 31 October

Tyler "showed lots of concentration and perseverance". Tyler got ready for Forest School quickly and independently on 31 October. In later sessions of the Forest School process, it was reported that Tyler "did good team work in his constructing with another friend", was "very focussed and motivated" and was "really energetic, very enthusiastic, wanted to answer everything, really keen on tasks".

Table 7.4: Quantitative outcomes for Tyler as identified by staff questionnaire

Measure	Pre-Intervention	Post-Intervention
Social and emotional well-being	86	100
Communication	217	229
Attachment/relationships	29	32
Self-Regulation	30	35
Initiative	27	33

7.3.3 Summary

Tyler started the Forest School experience with many skills in the areas of social and emotional well-being and communication. He was the only child that was reported to have used his own skills as a tool within Forest School, which he carried through the whole process. He was also the only child, of the three case studies, whereby it was not reported that the FSLs had to provide him with support during Forest School. Peers were part of Tyler's Forest School experience, not only providing him with inspiration and mirroring opportunities, but he also provided support to his peers. The interview did not identify as many outcomes for Tyler, compared with Maisie and Sam, perhaps because he started at a point where he already had many skills. However, his skills were "enriched" further. The diaries identified more outcomes for Tyler than the interview, yet these were reported *during* the Forest School sessions. Unlike Maisie, it was unclear if outcomes had transferred to the nursery environment. One aspect of Forest School that appeared to challenge Tyler was his need to negotiate his own position within the group. He had to work on his relationship with another child in order to allow him to share his thoughts but also convey his own.

7.4 Case Study 3

7.4.1 Child Profile

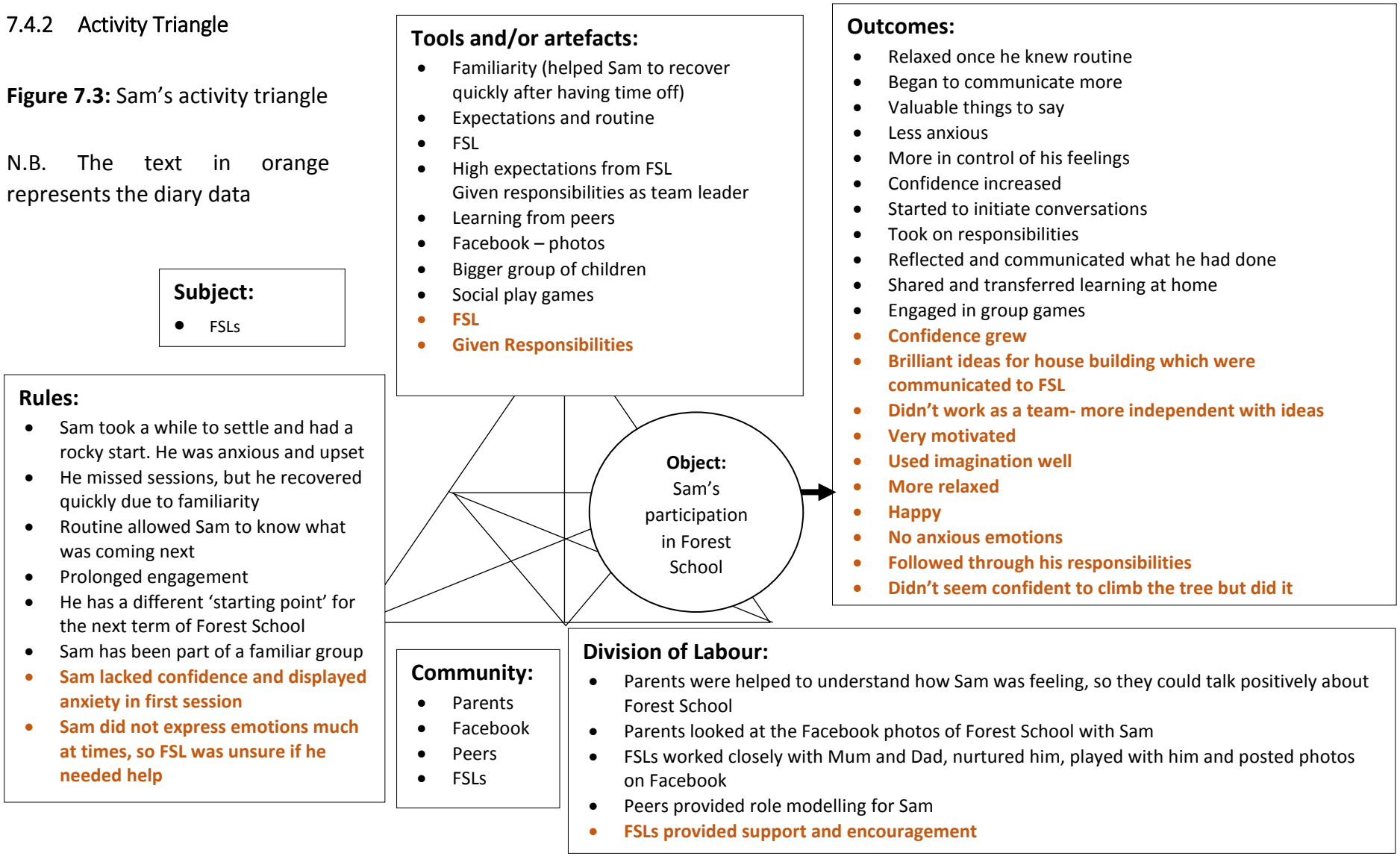
Table 7.5: Sam prior to starting Forest School

Sam	
Age:	3 years 9 months
Gender:	Male
Sam upon first starting nursery: He had an emotional ride; he found it hard to settle and cried a lot. He would sometimes do things independently and then he would be found somewhere having a cry or sitting by himself.	
Social and emotional well-being: • He was a bit happier but was still finding his feet at Maplefield • He found the emotional separation from Mum and Dad difficult • There was an emotional blanket around him • If he had to do something different, he would dissolve and get upset. • He needed a lot of nurturing, but once he realised it was ok, he would come out of himself and engage and join in with activities • He tended to play alongside other children, rather than engaging in group play • He would listen to what other children were doing and pass them something if they asked	
Communication skills: • He appeared unsure of himself and could get upset, as he found it hard to communicate what he was struggling with, and he knew if he cried it was intercepted, and he was given support • He could be quiet • He had clear language • He was able to share and feedback experiences, but he needed a lot of support to do so • He would communicate with other children, but there was an insecurity about his communication	
Additional information: • He appeared to be more at home in the outside environment. He tended to go outside and have independent time or play near an adult • He still needed a lot of support and an adult for security	

7.4.2 Activity Triangle

Figure 7.3: Sam's activity triangle

N.B. The text in orange represents the diary data



7.4.2(i) Tools

A tool which mediated Sam's Forest School experience was the familiarity of the sessions and him knowing the routine. This helped Sam to recover his confidence quickly after having some time off. The FSLs were also a tool for Sam as they mediated his experience through nurturing him, reassuring and playing alongside him. The FSLs also had high expectations of Sam which supported his experience. A tool for Sam was also the opportunity to be team leader, as he was given responsibilities. Sam also used his peers to learn from, he had learnt how to be team leader from watching his peers. The photos of the Forest School sessions, which were posted on Facebook, were also a tool for Sam, as he used these to talk about Forest School at home. The bigger group of children and social group games, which were specific to the Forest School sessions, were also noted as a tool which were important mediators of Sam's Forest School experience.

7.4.2(ii) Rules

There were some 'rules' which acted as a constraint to Sam's Forest School experience and some which supported it. Sam started Forest School upset and lacking in confidence, meaning that Sam took a while to settle and he had a rocky start, which had an impact on his Forest School experience initially. He wasn't sure what Forest School was and he was anxious and upset. Sam also had to have time off due to illness, which meant that he missed some sessions of Forest School, this acted as a constraint for Sam. However, his confidence recovered due to the familiarity and routine of the sessions. The prolonged engagement in Forest School supported Sam's experience, as taking part in sessions over a longer period allowed Sam to progress and put him at a good starting point for the next 10 sessions of Forest School. Sam reportedly did not always show his emotions, which impacted on his experience as the FSLs were unsure whether he needed help or not.

7.4.2(iii) Community

Others involved in Sam's Forest School experience included those directly involved, such as the FSLs and his peers, and also those indirectly involved, such as his parents. The Facebook community were also part of Sam's experience, as photos of Sam at Forest School were shared on Facebook.

7.4.2(iv) Division of Labour

Sam's parents contributed to his Forest School activity by listening to the FSLs in relation to how Sam was feeling, to encourage positive discussions about Forest School at home. They also looked at the photos on Facebook of Forest School with him. This also links to how the FSLs contributed to Sam's Forest School journey, not only did they provide support during the sessions, through nurturing and playing with him, they also worked closely with his parents in order to get them to talk positively with Sam about Forest School. Sam's peers contributed to his experience by providing role modelling and giving him the opportunity to learn from them.

7.4.2(v) Outcomes

There were many outcomes that were identified for Sam during the interview. It was reported that Sam relaxed once he knew the routine. He also "began to communicate more" and had "really valuable things to say". It was also suggested that once Sam had settled into Forest School "he seemed to be happier and he seemed to be less anxious" and "he seemed to be a little bit more in control of his feelings". There were a number of references to Sam's confidence increasing in a range of areas: in story groups; in a bigger group; in initiating conversations; and in communicating with others. Sam also became "more forthcoming with his language skills" and started initiating conversations, which "he didn't really do that before". Sam took on responsibilities as team leader: "because he was in a better place he actually took on that role really well and he did it with a smile as well

which was great to see". It was noted that Sam was beginning to think and reflect on what he had found and told the FSLs about it. He was also sharing at home: "he's gone home and he's talked to them about what he's been doing so he's transferring that learning into his home environment". Also, Sam engaged in group games, without showing anxiety.

In the diary entries it was noted that Sam's confidence had grown during the first session. In later sessions, he became more confident in sharing language and in recalling parts of a story. On 3 October Sam "had some brilliant ideas for house building and communicated them to me", "used imagination well" and was "very motivated". However, it was also noted that Sam "didn't work as a team" during that session and was "more independent with his ideas". On the 17 October "Sam didn't seem confident in himself to climb the tree but could do it by himself". In a later session (31 October) Sam became "more relaxed" and "came to Forest Schools happily, no anxious emotions displayed today, he was happy to be team leader". It was also reported that Sam "followed through his responsibilities".

Table 7.6: Quantitative outcomes for Sam as identified by staff questionnaire

Measure	Pre-Intervention	Post-Intervention
Social and emotional well-being	69	83
Communication	158	211
Attachment/relationships	23	29
Self-Regulation	26	28
Initiative	20	26

7.4.3 Summary

When Sam started Forest School, he reportedly struggled to communicate and was often quiet. He was still "finding his feet" at Maplefield and he had an "emotional blanket" around him. This was apparent in Sam's first session of Forest School, in which he lacked confidence and was anxious. It also took him a while to settle, which was then disrupted by him having to miss three sessions. However, the routine and familiarity of the sessions reportedly helped him to recover

quickly. As the sessions progressed, the diaries highlighted that Sam became more relaxed and happier in the sessions. The FSLs reportedly had a big influence on Sam's Forest School experience, and they provided him with different aspects of support. Having a bigger group of children at Forest School was a tool for Sam, as he learnt from his peers and he engaged in group games. Sam was the only child in which it was reported that the FSLs had to work closely with his parents. They helped his parents to understand how he was feeling so they could engage in positive conversations about Forest School at home.

As with Maisie, Sam had a large number of outcomes which were identified in both the interview and the diaries. Many references were made to Sam's confidence growing and his communication increasing. It was also reported that some of Sam's initial needs, such as anxiety, had reduced. However, as with Tyler, it was unclear if these outcomes had transferred further than the Forest School sessions and into the nursery environment. However, it was reported that he had begun sharing his Forest school experiences at home with his parents, and he was transferring his learning at home.

7.5 Reflections on Qualitative Analysis

The researcher spent a considerable amount of time at the research site. Although prolonged engagement is proposed to increase the credibility of qualitative studies (Guba & Lincoln, 1989), this shaped the researcher's constructs and views about Forest School and Maplefield Nursery. Therefore, the researcher was mindful of this and attempted to remain unbiased during the data analysis. It is recognised that the researcher's views of what may constitute the different nodes of the activity triangle (e.g. what is defined as a 'tool') may be different to others' constructs of these. Therefore, the researcher has been transparent with all stages of analysis and decisions made to allow the reader to consider the researcher's constructs of these nodes. Also, to ensure the data had not been heavily influenced by the researcher, the activity triangles were discussed with the FSLs on two occasions.

8 Discussion

8.1 Introduction

This chapter begins by considering the aims of the current research. The outcomes for each research question are discussed and attempts have been made to triangulate the quantitative and qualitative elements of the research. As the research is regarded a sequential mixed-methods design, the quantitative results are discussed first with additional interpretations in relation to the qualitative case studies. The outcomes from each strand of the research are then also considered separately and the results are considered in relation to the theoretical underpinnings of Forest School. The methodological considerations of the current research are also discussed, followed by the implications of the research for practice and future research.

8.2 Research Aims

The main aim of the research was to consider the impact of Forest School for nursery aged children. As can be seen in Chapter 2, the Forest School literature reports a wide range of positive benefits of Forest School for children in nursery, primary school, secondary school, and children with SEN. Forest School research has primarily utilised qualitative data collection methods and analysis. The current research attempted to create a more focussed evaluation of Forest School by utilising quantitative research methods in relation to specific outcome measures. The outcomes of the research were decided through a focus group with FSLs and a review of the literature. Therefore, the research sought to investigate the impact of Forest School on children's social and emotional well-being, specifically attachment/relationships, self-regulation and initiative, and children's communication.

8.3 Does participation in Forest School have an impact upon the attachment/relationships of nursery aged children?

The results indicate that both the control group and the experimental group made significant gains in their attachment scores from T1 to T2. There were also no statistically significant differences identified between the two groups at T1 and T2. Therefore, it cannot be concluded that Forest School has an impact on the attachment/relationships of nursery aged children. The measure predominately considered the child's relationships with adults, with only two items referencing interactions with peers, in relation to being happy during play and seeking help from peers. Even so, it was expected that the experimental group would have made greater gains, this being based on previous research that has identified that children aged 3-4 who took part in Forest School developed new relationships with both peers and adults (Massey, 2005). It should be highlighted that the research by Massey (2005) was, however, on a smaller scale than the current study and utilised only qualitative data collection methods, such as interviews and observations.

Given that the Forest School sessions at Maplefield Nursery are centred on team work and group games, perhaps the Forest School was not specifically targeting the areas that were measured (adult relationships). Instead something else, such as child development or another variable may be at the root of the gains in attachment/relationships scores for both groups.

The case study data suggested that the three children engaged in the development of relationships with peers. Maisie developed friendships in both groups of Forest School, which created a friendship group for her in nursery. Tyler had to work on his relationships with peers at Forest School, to enable him to share within the group without overshadowing his peers, who also wanted to share. There were also references to social skill development: Maisie gained confidence in social interaction and began communicating more with peers and adults; Sam started to initiate conversations and his confidence increased in groups; and Tyler displayed

good team work with a friend. These outcomes are supportive of previous *qualitative* research which has found positive outcomes for children that engage in Forest School, including improved social skills (Harris, 2015; Hughes, 2007; Southall, 2014) and evidence of team work (Harris, 2015). These studies are not without limitations, however, which to an extent bring into question the validity of the findings (See Chapter 2).

It could be argued that had the measure been focussed more on *peer* social interactions and relationships, greater gains would have been seen in the experimental group. However, this is a tentative statement, given that the other two scales did reference peer interactions and yet the overall social and emotional scores were not significantly different between the groups at T2. Furthermore, the previous studies mentioned have done little to explain areas of 'impact' that have been reported, for example, an improvement in 'social skills' is broad and can encompass many areas of skill development. It therefore makes comparisons of outcomes related to attachment/relationships in the current study with outcomes in previous research somewhat challenging.

8.4 Does participation in Forest School have an impact upon the self-regulation of nursery aged children?

The descriptive statistics indicate that there was a small increase in self-regulation scores for both groups, however, neither groups experienced statistically significant increases on this measure. It is interesting that both groups saw 'no significant impact' on the same measure, perhaps indicating that there are either other confounding variables or developmental effects which have impacted on the scores for both groups.

It is challenging to consider the concept of self-regulation in previous research, as many of the outcomes identified are either vague in description or link to broader concepts of well-being. However, McCree et al. (2018) generated interesting

qualitative data by tracking 11 children engaging in Forest School over a three-year period. They generated data from the children themselves, their parents and school staff using a range of methods. The most significant theme they identified was 'establishing self-regulation and resilience through emotional space' (p. 6). *Emotional space* refers to a physical space where the children can express their emotions: it was reported that the children achieved greater self-regulation and resilience, and that the *emotional space* was a vital ingredient towards this outcome. It was also noted that children utilised individual ways to self-regulate e.g. one child self-regulated through fantasy-play.

These conclusions from McCree et al. (2018) can be linked to outcomes identified in the case study activity triangles[12]. Reference was made to Tyler working on his relationships with peers and learning to share in groups, which indicates he developed his self-regulation when interacting with others. His respect for other children also grew. During the process of Forest School, the diaries indicated that Tyler demonstrated good team work with a friend and again, he was respectful when other children wanted a turn. There were various references to play and the development of friendships in the interview regarding Maisie, which indicated that Maisie was cooperative with others and played well with others, which links to self-regulation in group situations. Sam had an anxious start to Forest School and was upset during the first session. During this session Sam's confidence grew, and as the weeks passed, he became happier at Forest school and began to display no anxious emotions. It was reported in the interview that once Sam had settled into Forest School he became more in control of his emotions.

Harris (2015) gained the perspectives of 20 practitioners who had supported Forest School sessions. 'Personal, social and emotional development' was noted as an area of skill development. Within this area, practitioners reported children's development of self-awareness, such as learning about their emotional capabilities and learning to cooperate with others. These can be linked to Maisie's

[12] The DECA-P2 self-regulation measure was used as a guide to establish what outcomes in the activity triangles could be linked to the concept of self-regulation.

increased cooperation in group situations and Sam learning about how to control his emotions.

Obviously, these comparisons cannot be attributed to the wider experimental group, not least because the previous research noted here is based upon primary aged children, and also because the case study data in the current study is centred around individual experiences and perspectives. However, it is noteworthy that self-regulation does appear to be a part of Maisie, Tyler and Sam's Forest School activity.

8.5 Does participation in Forest School have an impact on the initiative of nursery aged children?

As with the attachment/relationships measure, the results indicate that the control group and the experimental group showed no statistically significant between-group differences at T1 and at T2. However, both groups made significant gains in their initiative scores from T1 to T2, thus, it cannot be concluded that Forest School has an impact on the initiative of nursery aged children.

In examining the individual question responses for each group, it appears that the control group and experimental group both made the highest collective gain in scores from T1 to T2 on question 23, which asked if the child chose to do a task that was hard for him/her. However, the other questions which produced the greatest gains were different between the two groups. The control group made collectively the second greatest gain in scores on question 21, which asked if the child makes decisions for himself/herself. Whereas, the experimental group made collectively the greatest gain in scores on question 10, which asked whether the child starts or organises play with other children. This may relate to the children in the two groups typically having been at the nursery for different lengths of time. It could be that children in their second term (i.e. control group) start to become

more independent, yet children in their third term (i.e. experimental group) start to be more organisational in play. An alternative explanation here could be that Forest School specifically targets children's initiative in their play behaviours. This is not an unsupported statement, given the play-based nature of Forest School and references to play in all three case study activity triangles.

The DECA-P2 initiative measure (See Table 4.6) centres around children developing confidence in their abilities, showing persistence, attempting to solve problems, making decisions, choosing to do tasks that are hard and trying new things. In contrast to the quantitative outcomes of the current study, previous research has concluded that Forest School impacts many of the areas noted above. The development of confidence has been noted as a positive outcome for children engaging in Forest School (Hughes, 2007; Massey, 2005; Maynard, 2007; O'Brien & Murray, 2005). Also, practitioners reported that children aged 3-4 gained confidence in trying new experiences in Forest School (Massey, 2005), and this impacted on their confidence in self-initiating tasks. The case study data indicated that both Sam and Maisie's confidence grew whilst at Forest School. It was reported that Sam's confidence grew in groups, in initiating conversations and communicating with others. Similarly, Maisie was reported to have gained confidence in social interaction, to have a go at things, to engage in play, to communicate and to share her skills. Interestingly, Maisie had taken this inner confidence into nursery and was beginning to engage in big group activities, which she previously had not done.

As noted in the previous section, Harris (2015) reported 'personal, social and emotional development' as an outcome based on practitioner perspectives. Within this, some of the themes were noted as being imagination, improvisation/resourcefulness and independence. In the current study, both Sam and Maisie took on responsibilities as team leader and followed through with these. In two of the sessions it was reported in the diaries that Maisie was unsure about a certain task/game but took part in it anyway.

The opportunity to investigate and having the flexibility to explore their own interests were noted as 'tools' for Tyler and Maisie. It was perhaps this opportunity for child-led, self-initiated tasks (mediated by adult support) that allowed them to succeed, through risk-taking, taking small achievable steps and accessing problem solving tasks (Massey, 2005). Practitioners believe that it is this risk-taking that encourages the development of children's self-confidence (Maynard, 2007).

8.6 Does participation in Forest School have an impact upon the overall social and emotional well-being of nursery aged children?

The data highlights that the null hypothesis is to be retained, as it cannot be concluded that Forest School has an impact on the overall social and emotional well-being of nursery aged children. Both the control group and the experimental group made significant gains in overall social and emotional well-being from T1 to T2. Interestingly, both groups made significant gains on the same two of the three measures (attachment/relationships and initiative). In summary, it appears that there were no evident and clear statistically significant differences between the two groups.

It is difficult to consider these findings in relation to previous research on Forest School. This is due to the limited number of experimental research attempts, the vagueness of outcomes, and the limited descriptions of the Forest School under investigation. The reader is therefore encouraged to view any comparisons made tentatively and critically.

The majority of Forest School research in the UK has produced qualitative data, used qualitative analysis methods and typically produced 'themes'. Much of the previous literature has noted at least one outcome or theme that could be related to positive outcomes for children in social and emotional well-being:

- Self-esteem and self-confidence (Maynard, 2007)
- Personal, social and emotional development: heightened self-esteem; developed new relationships with peers and adults; gained confidence (Massey, 2005)
- Confidence and motivation (O'Brien & Murray 2007)
- Increased self-esteem and self-confidence; improved social skills (Hughes, 2007)
- Personal, social and emotional development: imagination; improvisation/resourcefulness; relationships with others; self-awareness; independence; responsibility/risk (Harris, 2015)
- Supports confidence, social skills, and emotional well-being (Southall, 2014)
- Development of friendships; overcoming fears and anxieties, (Bradley & Male, 2017)
- Establishing self-regulation and resilience; socially confident learners; well-being visible in school (McCree et al., 2018).

The case study activity triangles do appear to support the outcomes in these qualitative studies, as noted under the three previous research questions.

As discussed in Chapter 2, McCree et al. (2018) utilised mixed methods in generating data on how well-being, connection to nature and academic attainment are manifested through Forest School engagement. To gain data on emotional well-being they utilised the Leuven scale for well-being, that considers children's ease with one-self, emotional tensions and views of the self (such as self-confidence) (McCree et al., 2018). They found high levels of well-being scores for the children during the sessions. As with the studies and outcomes listed above, this suggests that Forest School has a positive impact in this area and that significant differences between the groups should have been evident in the quantitative element of the study. There were, however, methodological limitations in the study by McCree et al. (2018) which make it difficult to draw any

strong conclusions from the data. It is also arguably difficult to consider how the measure used in the study by McCree et al. (2018) relates to the measures used in the current study, as the Leuven Scales could be argued as being subjective in nature and the scores were generated *during* the sessions, rather than pre- and post-intervention.

8.7 Does participation in Forest School have an impact upon the communication skills of nursery aged children?

The quantitative element of the study does not allow for a conclusion that Forest School has an impact on the communication of nursery aged children. The control group and the experimental group both made significantly greater gains on the communication measure from T1 to T2 and these scores did not differ between the groups. The communication measure contains various specific items e.g. 'My pupil can tell adults who do not know my child well about past events'. Although the Head Teacher knows the children well, as she spends a large proportion of her day engaging with the children, it is unclear if she or any staff member would have been well equipped to answer such specific questions. This is where triangulation with parent data would have been particularly helpful.

Vygotsky (1978) emphasised the importance of social interaction in child development, particularly their use of language. From this perspective, language is considered as a tool for conveying social understanding, which also influences individual cognitive understanding. The children at Maplefield Nursery all have access to social interaction with peers and adults throughout the entire day. Not only this, the children in the control group also engage with the children from the experimental group. These children may have shared some of their skills through language and social interaction. Alternatively, perhaps some forms of language development occurs as an internal cognitive process, which cannot be measured through adult questionnaire data.

Communication and language development in children is reportedly influenced by participation in Forest School (Harris, 2015; Hughes, 2007; Massey, 2005; O'Brien & Murray, 2005; Southall, 2014). Massey (2005) in particular, noted that children aged 3-4 became more motivated to use meaningful language and their questions became more specific, following engagement with Forest School. This was reflected in the case study data of the current study. Tyler's language at Forest school was descriptive and he developed his vocabulary, saying things like 'it's stable now', indicating the structure was stronger. Maisie became more communicative with adults and peers, particularly in shared discussions and with friends. In the diaries it was recorded that she had used a louder voice, she was independently using language and that she asked adults questions. Some of these skills were also observed outside of the Forest School environment, as she began communicating more with friends in nursery. Sam also began to communicate more and had valuable things to say. Sam reportedly became more confident in communicating with others and was able to reflect and communicate what he had done at Forest School. The diaries suggested that as the sessions progressed, Sam started sharing language when invited, and was able to recall parts of a story he had heard the day before. This can be regarded as a positive impact for Sam, when thinking about his communication skills prior to starting Forest School. Sam also started sharing what he had done at Forest School with his parents at home, which was supported by visual aids (photos of Sam at Forest School). These outcomes could be because Forest School provides opportunities for the children to use language and develop their vocabulary (Massey, 2005).

The quantitative outcomes may be due to the displaying of skills, in the areas of language and communication, being more specific to the Forest School environment. As noted in Chapter 2, Richardson and Murray (2017) highlighted that the children's use of language was affected more positively in the Forest School environment, than the indoor and outdoor classrooms. The children used exclamation and expressive language when in Forest School. This was linked to the child-led activities and opportunities for play. Although this was only a small-scale study and cannot be generalised too widely, it suggests that Forest School affects

language use more positively than other learning environments (indoor and outdoor classrooms). It is possible that these are mainly observed when the child is in that specific Forest School environment, due to the sensory and visual experiences that Forest School affords (O'Brien & Murray, 2007). This could account for the incongruence between the quantitative data in the current study and previous research: although the children may appear to be utilising communication and language skills to a high level whilst engaging in Forest School, they are displaying the same progress in communication as their peers that do not engage in Forest School.

8.8 Exploration of the Quantitative Outcomes

Although the quantitative research strands resulted in the null hypotheses being retained across the research questions, the data provides some interesting insights and raises more questions. As both groups made significant gains across four out of the five outcomes measured, there are various discussion points which need to be considered.

8.8.1 Is the data a reflection of Maplefield Nursery and the Forest School ethos they adopt?

It may have been difficult to capture the impact of Forest School, as the data may instead reflect the effective nursery practice and skills of the staff. The nursery has been rated by Ofsted as 'outstanding' for many years and has been recognised for providing excellent teaching and support to the pupils. Furthermore, the most recent Ofsted report noted that the nursery staff are skilled at providing opportunities for speech and language development, which is perhaps reflected in the scores on the communication measure. The Head Teacher reported that the nursery ethos is built around well-being and that a focus on social and emotional development underpins everything the nursery do. The nursery track children's well-being through the Ferre Laevers emotional well-being and involvement

scales. Therefore, the social and emotional well-being scores may reflect the nursery's focus on supporting children in these areas. Had the study been conducted in a different nursery, would a noticeable impact in the experimental group have been observed? Does the data suggest that if a nursery is providing quality early-years teaching and learning, Forest school does not 'add' any additional benefits in relation to social and emotional well-being and communication?

Another perspective that could be taken here is that the data does reflect the impact of Forest School, because both the control group and the experimental group were receiving some element of Forest School. The nursery has embedded the Forest School ethos throughout the entire nursery. The children in the control group have continuous access to the outside environment and teaching from trained FSLs, thus it is likely that the FSLs transfer their Forest School skills to all children.

As discussed in Chapter 2, Mackinder (2015) tracked a child through two Forest School sessions that were planned and implemented by two different practitioners. One of the practitioners was Forest School trained and the other was not. The Forest School trained practitioner planned and prepared the session in a way that allowed herself to engage, observe and participate whilst also allowing the child to experiment. The child scored highly on participation and involvement in this session. The practitioner that was not Forest School trained displayed more dominating and authoritative behaviours, applying rules that did not allow for child experimentation. This resulted in less participation and involvement from the child, thus showing the benefits of being supported in the outdoor environment by a FSL. Furthermore, some children in the control group access 'Earth Elves', which although different to Forest School (See Section 4.6.1), does have some of the same elements.

A further perspective that could be taken is that the data reflects the positive impact of outdoor learning and the free-flow learning environment. The nursery

staff have created an engaging multi-sensory outdoor environment for all the children, which they are free to engage with when they wish. Children can access the curriculum inside and outside as part of a 'continuous curriculum'. As noted in Chapter 2, learning outdoors can provide children with many developmental benefits (Maynard & Waters, 2007). It has been suggested that compared to the classroom environment, the outdoor environment allows children to explore in a unique way (Maynard, 2007). In a review by Fiennes at al. (2015) of 58 studies of outdoor learning (some of these studies evaluated Forest School) a range of positive outcomes were noted, with the most common outcomes identified as communication and teamwork, health and well-being and self-esteem. Thus, is it the general outdoor learning and ethos of the nursery that had an impact for all children?

The raw data highlights some patterns in the data. The children that made the greatest gains on a measure (compared with others in that group) had lower pre-intervention scores on that particular measure. For example, a high increase in communication score was accompanied by a low pre-intervention communication score. This was the case for both the control group and the experimental group and for all the measures[13]. The children that only made small gains in scores or decreased slightly in scores, generally had higher pre-intervention scores. It appears that children at the nursery make greater progress, in the areas of communication and social and emotional well-being, when they are initially less skilled in these areas.

It should be borne in mind that the current research evaluated specific areas of impact, and had other areas been considered, such as physical development or knowledge of the environment, then the results may have shown an impact of Forest Schools.

[13] Children that scored low on one pre-intervention measure did not necessarily score low on all pre-intervention measures.

8.8.2 Are individual learning experiences so fundamental to Forest School that it is difficult to capture its impact by grouping children?

As previously noted, Forest School has been associated with constructivist pedagogy (Knight, 2018; Leather, 2018; O'Brien & Murray, 2007; Seyfried, 2002), which suggests there are no objective realities and that we each differ in our constructions of the world (Seyfried, 2002).

As can be seen in the case studies (See Section 8.9), each child had a different experience of Forest School. It is possible that some of the difficulties in using experimental methods to evaluate Forest School are due to this. Individual learning experiences may be so fundamental to Forest School that it is difficult to capture its impact by grouping children, without consideration of such individualisation.

8.8.3 Are the positive outcomes of Forest School limited to the Forest School sessions?

McCree et al. (2018) reported in their study, in relation to the completion of the well-being questionnaires, that "school staff present on the sessions rated the children higher overall than the teachers who saw the children solely in school" (p. 12). They linked this to the idea that the staff had developed 'new perspectives' of the children whilst seeing them in the woodland. This is thought-provoking for the current research, as the Head Teacher rated the children based on her observations and understanding of the children in the nursery environment. She does not attend the Forest School sessions. It was only reported in Maisie's Forest School activity that she took some of the skills learnt at Forest School into the nursery environment. Perhaps the positive outcomes from engaging in Forest School are limited to when the children *are* at Forest School. This may account for why the case study activity triangles identified many positive outcomes, as the FSLs that provided data for the activity triangles were with the children in each session.

8.8.4 Does it take longer than 10 sessions to identify impact and differences between groups?

Research undertaken by O'Brien and Murray (2005) reported changes in child outcomes over an extended period, thus they recommended that children need regular contact with the natural environment. Although the children at Maplefield nursery engage with the natural environment regularly whilst at the nursery, the Forest School sessions under investigation were for a period of 10 sessions. It is possible that the positive impact of Forest School is not evident (using quantitative methods) until the child has experienced prolonged engagement in Forest School. Furthermore, McCree et al. (2018) evaluated Forest School over a three-year period and demonstrated that Forest School was influential for the children over time.

During a feedback visit to Maplefield Nursery, the FSLs felt strongly that the children had made further progress during another 10-week cycle of Forest School, after the research had finished. They also suggested that the current research had only captured half of the children's Forest School journeys.

8.8.5 Could the impact of Forest School be successfully captured by changing the design and using different quantitative research methods?

As identified by Scrutton and Beames, (2015), there appear to be consistent methodological challenges in outdoor education research: size and composition of the sample; suitability of self-report questionnaires; and managing confounding variables. Although attempts in the current research were made to address these, there were some methodological limitations (See Section 8.12). The sample size was low, impacting on the statistical power, and thus the chance of finding any differences between the groups. Questionnaires were used to collect data and the data was only generated from one source, the Head Teacher. Also, as has been discussed previously, confounding variables may have impacted on the data.

Section 8.12.5 discusses the possibilities for future quantitative research in evaluating Forest School.

8.9 Exploration of Qualitative Outcomes

The case studies generated interesting information in relation to the mediation that occurred during the experiences of three children. Readers should be mindful that these were not the direct experiences from the children - given their age it would have been difficult to have gained case study data directly from them - these were based on the perspectives of the FSLs.

The three activity triangles highlighted that the children's 'starting point' (i.e. their levels of skill, confidence, anxiety etc. prior to starting Forest School) impacted on their Forest School experiences. This impact was different for each child. Sam took a while to settle and started from a point in which he had struggled to settle in nursery and was reported as being an anxious and emotional child. Masie was also reported to have low confidence and anxiety, which then acted as a barrier. Tyler, however, started from a point at which he was emotionally solid, confident and communicative, which enabled him to use these skills as a tool that positively mediated his Forest School experience.

It is interesting though that of the three children, Tyler had the least number of reported positive 'outcomes' from the interviews. The diary data did indicate some within the sessions, but it is unclear whether these outcomes were reflective of new and changed skills or just him utilising the skills he already had. Whereas, Sam and Maisie had greater outcomes reported, some of which were reported as transferring to other nursery activities and at home. Interestingly, Sam and Maisie could be regarded as being at a 'lower' level than Tyler, in the areas of social and emotional well-being and communication, prior to starting Forest School. This would suggest Forest School had the most impact in the areas of social and emotional well-being and communication *for the children that had higher needs*

in these areas prior to starting. This is also supported by the discussion regarding an examination of patterns in the raw quantitative data (See Section 8.8.1).

Also, there were no references to Tyler having utilised the support of the FSLs. It could be that this was just not reported for Tyler, however, it could also be that as Tyler was a skilled child, he was able to scaffold his own learning and engage independently, whereas Maisie and Sam received scaffolding from FSLs and peers. This might have mediated their experiences, and if so, is likely to have contributed to the outcomes that were reported. It appears that the FSLs gave Tyler, Sam and Maisie different levels of support, based on the skills they already had. Vygotsky's (1978) theory in relation to the ZPD would suggest that the children were supported by a more capable other, in a way that allowed them to progress their skills.

In two activity triangles there were references made to the routine, familiarity and consistency of the Forest School experience. Sam missed sessions which impacted on his experience and Maisie was unable to attend a regular session, switching between morning and afternoon sessions. However, the routine and familiarity of the sessions positively supported Maisie and Sam through these challenges, giving them the opportunity to learn what was happening next.

In all three activities there were references made to home life and parents. Although these were for different reasons, it is clear that the influence from home is important in the Forest School experience. Sam's parents engaged Sam in discussions about his Forest School sessions, using photographs to initiate conversations. Tyler's parents were reported to have supported his skill development at home, and Maisie's home life and changes to her home situation impacted on her emotional well-being, which impacted on her behaviour in nursery and Forest School.

There were also some commonalities in the three activity triangles related to the tools used to mediate the Forest School experience. Social group games were

noted as being beneficial for all three children, as was the influence of peers at Forest School. Vygotsky's (1978) work on social development would suggest that the children developed constructs and skills based on these social interactions.

The bigger group was reported as a tool for both Tyler and Sam, and the benefit of the natural environment was noted for both Maisie and Tyler. The opportunity to be team leader was reportedly very beneficial for Sam and Maisie, which is interesting given their earlier confidence levels. This experience may have afforded them the opportunity to try being a leader, which is not something they would usually do independently.

8.10 Theoretical Considerations

8.10.1 Experiential Learning Theory

Experiential learning has been described as learning which relies on direct experiences, most commonly through actively engaging in problem solving (Higgins & Nicol, 2002). Forest School provides direct experiences with nature. The case study data highlighted that children had the opportunity to engage in a range of direct experiences, such as group games, fire lighting and tree climbing. The children were also challenged by new skills and were given responsibilities. Kolb's experiential learning theory would suggest that all of these experiences can be considered as the concrete experience stage, as the children had direct interactions with an experience.

The case studies highlighted that new skills were being displayed. For example, Maisie utilised her communication and social skills in the wider nursery environment. Also, each week the children became more confident in the Forest School environment, showing a developing understanding of the activities and structure of Forest School. Furthermore, the diaries made reference to children going back to self-chosen activities that they had started the week before. This

reflects some element of 'active experimentation'; experiential learning theory would suggest that prior to this, the children engaged in 'reflective observation' and 'abstract conceptualization' (i.e. interpreting the experiencing, then generalising the experiences: Higgins & Nicol, 2002).

As noted previously, all the children have access to a free flow outdoor learning environment. This could be argued as experiential learning, thus it is likely that the development of new skills through experiential learning is occurring for *all* children at the nursery.

8.11 Forest School Aims and Outcomes of the Current Study

As discussed in Chapter 2, Forest School promotes a child-led approach to education, through frequent learning in an outdoor woodland area. It is reportedly unique from other outdoor education approaches due to the requirement that practitioners be qualified to undertake Forest School, that practitioners use a 'framework', and that activities are led by the children's interests (Massey, 2005). In the current study it was clear that the staff involved in Forest School were qualified and there was a framework followed each week. However, this framework appeared to be specific to Maplefield Nursery, which they had developed to incorporate curriculum time and child-led activities. It is not clear what the intended 'framework' of Forest School is, which is perhaps due to the range of training providers and the flexible nature of Forest School. Despite this, the FSA do provide details of FSA approved trainers and providers which have agreed to follow a specific code of conduct and the principles of Forest School. In much of the literature the child-led nature of Forest School is celebrated and stated as one of its defining characteristics. However, it is unclear what is meant by 'child-led' learning and to what extent Forest School should be centred around this. Maplefield Nursery did incorporate some child-led time in each session, by giving children a starting point or topic and allowing them to then explore freely, yet, encouraging them to do so within the specific task. However, 'child-led' could

be interpreted as allowing the children to explore completely independently, with no task parameters. Again, this raises the question of whether Forest School can be considered a consistent approach if settings are able to implement it in a flexible way.

The FSA developed six principles of good Forest School practice (See Section 2.7), perhaps to bring some consistency to the Forest School approach. The first principle indicates that Forest School should be a long-term process of regular sessions, rather than one-off or infrequent visits. This perhaps is different to other forms of outdoor learning, that may be regarded as a reward or intermittently implemented. It could be why Forest School has produced positive outcomes in previous research. In the current study it was clear from the case studies that all three children benefited from having prolonged engagement with Forest School. Both Maisie and Sam took time to settle into the routine and familiarity of Forest School, but over time they became more confident and engaged, doing things they would not typically have done. Although the quantitative data did not show any group differences over the 10-week cycle, the Forest School Leaders at Maplefield Nursery felt this was because only half the children's journey had been captured. They noted that in the following 10 weeks that the children participated in Forest School, the children made more noticeable progress.

One of the FSA principles suggests that "Forest School aims to promote the holistic development of all those involved, fostering resilient, confident, independent and creative learners" (FSA, 2017c). This is the only principle that discusses the aims of Forest School in relation to potential outcomes for children and young people. The FSA website expands on this further and suggests that "Forest School programmes aim to develop, where appropriate, the physical, social, cognitive, linguistic, emotional, social and spiritual aspects of the learner" (FSA, 2017c). The aims noted here, link closely to outcomes identified in previous literature (See Chapter 2) and to the 'benefits' of Forest School suggested by the FSLs in the focus group undertaken in the current study. Although benefits in the area of social and emotional well-being and communication were identified through the qualitative

strand of the current research, the quantitative strand highlighted that both the Forest School group and the control group made gains in these areas. This suggests that these aims associated with Forest School are perhaps not unique to the approach, and reported outcomes are also evident though good quality nursery practice and a whole school outdoor learning approach. It should be recognised that the aims suggested by the FSA are broad and arguably incorporate most areas of child development, and link closely to the Early Learning Goals of the EYFS (DfE, 2017). The current research utilised an experimental approach in an attempt to remove confounding variables and isolate the outcomes of Forest School. However, the current research may have highlighted that it is difficult to capture 'outcomes' of Forest School in this way, as the statutory aims and outcomes of Early Years practices are too intertwined with Forest School to successfully isolate any significant difference. What can be taken from the findings of the current study is that children at Maplefield Nursery made significant gains in the areas of social and emotional well-being and communication. Thus, suggesting that the wider nursery approach is successfully targeting elements of the Early Learning Goals of the EYFS. It is difficult to know what is having this effect at this nursery, but it is likely that a combination of quality early years practices, which target the EYFS, and the whole nursery ethos and approach to outdoor learning is a large contributing factor.

As mentioned, the current research aimed to utilise experimental methods to capture outcomes. This has addressed some of the issues associated with much of the previous research on Forest School, in particular the issues associated with using only qualitative data, such as subjectivity and a lack of control of confounding variables. The current research also utilised a control group, which has not been utilised in much of the previous research, and although the control group in the current research may have been compromised, it did prove useful in preventing a type 1 error. However, it is evident that there are also difficulties in completing outcome focussed research in relation to Forest School, not least due to the difficulty in successfully isolating the outcomes of Forest School, but also due to the various threats to internal validity. Perhaps then, future research on

Forest School should not necessarily be centred around outcomes, rather it should endeavour to consider what it is about Forest School that separates it from other forms of outdoor learning and early years practices.

8.12 Methodological Considerations

8.12.1 Analysis

The current study had a small sample size due to the availability of participants and consent response rates. Scrutton and Beames (2015) highlighted that low sample size is a recurring issue in outdoor education research, as researchers are required to use readily available samples. This had an impact on the statistical power of the current study. In order to try and counteract this, the researcher considered making changes to the significance levels that were accepted (Scrutton & Beames, 2015), however, this was not done, as it would have increased the possibility of a type 1 or type 2 error.

Non-parametric analysis has been used in the current study, which is statistically less powerful than parametric analysis. Although parametric analysis is generally favoured (Dancey & Reidy, 2014), non-parametric analysis does not rely on assumptions about the population, which was necessary given the distribution of data in the current study. It is possible that parametric analysis would have been more powerful, thus finding between-group differences. However, some would argue that questionnaires generating ordinal data should not be subjected to parametric analysis, regardless of a normal distribution of the data (Jamieson, 2004).

8.12.2 Threats to Validity

Internal validity relates to whether any changes in the dependent variable can be attributed to the independent variable (Mertens, 1998). Cook and Campbell (1979) identified threats to internal validity and these were discussed in relation to the current study (See Section 4.9.2).

Issues arose in regards to the selection of participants. The children selected to be in the control and experimental groups were pre-determined based on the nursery practices. Therefore, the children within the groups were mostly taken from different term groups (i.e. which ' term' group the child was in). This resulted in a slightly lower mean age for the control group. This has implications for maturation, and the possibility that the children were at different stages of development. Also, the children may have developed in different ways depending on how long they had been in the nursery. This could also have resulted in selection effects, however, no significant differences were found between the groups on the pre-intervention questionnaire scores.

One of the main threats to the internal validity of the current study appears to be the likelihood that diffusion of treatment occurred. As previously described, the children in the control group have access to 'Earth Elves', which is a weekly session specific to Maplefield Nursery. Although this is different to Forest School (See Section 4.6.1), the children engaged in outdoor activities with a FSL. In addition, the free-flow learning environment in which children can freely choose to engage in activities outside was available to *all* children, and the FSLs provide support in this environment to *all* children. The use of another nursery to form a control group was considered, however, given the unique practices implemented at the nursery, this would have generated many other difficulties and threats to validity.

External validity refers to the generalisability of the study (Robson, 2011). As discussed in Chapter 4, LeCompte and Goetz (1982) identified four threats to external validity. In the current research the generalisability is reduced due to the setting in which the research took place, as the outcomes of the research may be

specific to Maplefield Nursery. In order to try and reduce this, a clear description of the nursery has been provided to highlight the setting characteristics. It is acknowledged that the outcomes cannot be generalised to all nursery settings, rather, settings which adopt similar practices to Maplefield Nursery.

8.12.3 Measures Used

It should be considered that the measures used in the current research may not have measured the constructs identified during the focus group. As previously discussed, the 'attachment/relationships' measure appears to focus on relationships with adults, rather than with 'peers'. Although the overall social and emotional measure did include some items related to relationships with peers, it perhaps did not capture the outcomes related to Forest School, such as team building and group games. This should be considered when interpreting the findings.

Also, the measures used were both developed outside of the UK, which does raise questions regarding the applicability of the measures to children in the UK and the possible influence of cultural factors. However, both measures were tested for convergent validity with measures heavily used and researched within the UK (e.g. ASQ). Furthermore, standardised scores were not used in the current study.

The use of questionnaires in the current study may have increased the likelihood of testing effects and bias. Observational methods could have been used, however, this too may have generated subjective data.

8.12.4 Parental Engagement

It was hoped that parental questionnaire data could be gathered and triangulated with staff data. This would have allowed for an interesting comparison of data. However, it was difficult to engage parents in the current research. This was also

noted by McCree et al. (2018) in their recent investigation of Forest school, in which parental questionnaire response rate was low. This needs to be considered in future research if parents are to be included. Measures may need to be put in place to increase parental engagement, such as through regular workshops or data collection sessions.

8.12.5 Qualitative Research Element

As discussed in Section 6.5, attempts were made to increase the credibility, transferability, dependability and confirmability of the qualitative research element. The researcher remained transparent throughout the research process and reflected on the analysis.

The data has allowed for useful triangulation of data with the quantitative research element, which has been lacking in previous Forest School research.
The use of activity theory to analyse and present the case studies allowed for analysis on the possible mediating factors involved in the children's Forest School experiences. This was an interesting element to the research, which could be taken further in future research.

The case study data is useful, particularly in light of the methodological issues that impacted on the validity of the experimental research element. However, case study data alone would not have been as useful. Further consideration of the mixed methods approach is given in the following section.

8.12.6 Strengths of the Current Study

8.12.6(i) Development of Outcomes

The inclusion of the FSLs in generating the outcome measures provided an element of 'collaborative inquiry', which has been advocated for use in outdoor

education research (Rea, 2008). Heron (1981) argues that researchers should interact with participants, so they contribute to hypothesis making and/or formulation of conclusions. Heron (1981) suggested this is important in research, as without it, the wrong questions can be asked, misinterpretations of constructs can be made, and the researcher can lack understanding of the entity being researched. Applying this approach ensured engagement from the nursery and ensured the research was relevant to the context under investigation.

8.12.6(ii) Mixed Methods Design

A mixed methods design was employed in the current research which allowed for rich data to be gathered and triangulated (Kellaghan, 2010). Although the researcher suggests that the reader should give more weight to the quantitative data, there has been no allegiance with a specific method, thus increasing the validity and reliability of the research (Cohen et al., 2011).

There are numerous 'errors' associated with utilising only one method, and mixing methods may diminish some of these through the triangulation of data (Sechrebt & Sidani, 1995). As noted by Johnson and Onwuegbuzie (2004), mixing methods "opens up an exciting and almost unlimited potential for future research" (p. 20).

Robson (2011) noted the potential for discrepancies in findings from qualitative and quantitative elements, which could prove challenging when drawing conclusions. However, Johnson and Onwuegbuzie (2004) suggest that the goal of mixed methods research is to expand understanding, not to corroborate conclusions, and that if there are conflicts within the findings, then greater knowledge is achieved. This is apparent in the current research, which has opened up a range of possible discussion points and areas of consideration for future research.

8.12.6(iii) Data Collection

Although concerns have been raised regarding the appropriateness of the measures in relation to outdoor learning research. The measures have been subjected to significant testing for reliability and validity by the authors. These were deemed as more robust than developing a measure specifically for the current research.

Furthermore, the questionnaire data was generated from one staff member, the Head Teacher. Although this could have added an element of bias to the data, in generating data from only one staff member it has reduced the possibility of instrument effects, in which multiple staff members may have had different interpretations of the measure items.

8.13 Implications of the Research

8.13.1 Implications for Maplefield Nursery

Maplefield Nursery provides training to other schools in relation to their approach to outdoor learning. The current research has afforded them the opportunity to evidence the positive impact their practices have on children's social and emotional well-being and communication and advocate this to other educational settings.

The current research has also highlighted that there were no significant differences in the outcomes for those children engaging in Forest School and those that were not. As noted, this is perhaps due to differences not being observable after only 10 sessions of Forest School, thus Maplefield Nursery can be confident in their decision to provide further cycles of Forest School.

Furthermore, there were positive outcomes reported for the three case study children. Yet, no differences were found in the questionnaire data generated by the Head Teacher. As previously discussed, this could be due to the outcomes being limited to the Forest School sessions, and because the FSLs may have developed 'new perspectives' of the children in the sessions (McCree et al., 2018). This should be considered when staff make assessments of the children.

8.13.2 Implications for Other Educational Settings

The literature highlights a number of positive outcomes for children engaging in Forest School. This is not only the case for Forest School and the programmes in Denmark, but also outdoor learning in general is suggested as having a positive impact for children and young people (e.g. Dillon et al., 2005). This then raises the question of what makes Forest School different? What is its unique contribution to outdoor learning? Research suggests it is the child-led approach (Mackinder, 2015; Massey, 2005; O'Brien & Murray, 2007; Southall, 2014). However, the case studies in the current research would suggest the continuous involvement, routine and social element mediate the child's experiences at Forest School.

Perhaps it is not essential for schools to specifically provide Forest School, instead, utilising a free-flow outdoor environment is suitable in generating the benefits associated with outdoor learning. However, it is likely that Maplefield Nursery's practices have stemmed from staff training in Forest School and an understanding of the theoretical, philosophical and contextual foundations of the approach. Mackinder (2015) highlighted the benefits of practitioners being Forest School trained, providing an insight into the potential benefits of a child being supported in the outdoor environment by a Forest School trained practitioner. Children at Maplefield Nursery, whether they engage in the structured Forest School session or not, are supported by Forest School trained staff in the outside environment. All staff members at Maplefield Nursery are involved in the Forest School in some way, either through formal training or through supporting the sessions. The Forest School ethos is reportedly embedded in their practices. It is clear that children at

Maplefield Nursery significantly improved in their social and emotional well-being and communication skills in one term. It is likely that Forest School has heavily influenced the outdoor teaching practices at Maplefield Nursery, thus suggesting the utility and implications for providing Forest School training to nursery/school staff.

If schools are unable to provide staff with Forest School training, however, it is likely that allowing children the opportunity to engage in experiential outdoor learning, giving them freedom to explore, whilst providing appropriate scaffolding, will have a positive impact on the children's social and emotional well-being and communication.

8.13.3 Implications for the LA and Policy Makers

Leather (2018) argues that Forest School has become commodified in the UK and the positive impacts of Forest School are being stated by professionals, despite little rigorous evidence to support such claims. It is recognised that the Forest School ethos and the Forest School trained staff appear to be having a positive impact for the children at Maplefield Nursery. However, it could also be argued that the general outdoors approach to education that they adopt is also a factor in these positive outcomes. Perhaps then, other outdoor approaches, which do not require training, provide similar opportunities for children.

Although the *Learning Outside the Classroom Manifesto* (LOtCM) (Department for Education and Skills, 2006) advocates for children and young people to experience a 'world beyond the classroom', there is very little guidance on what this could look like, and the definition of 'outdoor learning' provided in the LOtCM i.e. "the use of places other than the classroom for teaching and learning" (DfES, 2006, p.1) lacks clarity. Perhaps schools are choosing to utilise Forest School, over other approaches, as it provides them with concrete training to implement in practice. Alternatively, schools may not be utilising any form of outdoor learning, as again, there is little guidance on how to do so effectively and it is not presented as a

requirement of the curriculum. It is also possible that school staff feel there is not the time for outdoor learning practices, due to the importance given to other areas of the curriculum, such as Literacy and Numeracy, and the pressures schools face in meeting targets in such areas. However, the current research would suggest that all areas of the curriculum could be incorporated into experiential outdoor learning practices, rather than it being a reward or add on to the usual curriculum, and this is something that should be advocated through policy.

Providing teaching on experiential learning theory and research on outdoor learning (including Forest School) to training teachers would begin to address these issues. Furthermore, if the government advocates that every child should experience outdoor learning, more needs to be done to make schools accountable for doing so. Although Ofsted suggest that schools should ensure "opportunities for all learners to engage in learning outside the classroom as a key, integrated element of their experience" (Ofsted, 2008, p. 6), in the document *Learning Outside the Classroom*, it appears that there is no consideration of such opportunities in their assessments of schools (See *Common Inspection Framework;* Ofsted, 2015).

8.13.4 Implications for Educational Psychologists

Educational Psychologists (EPs) can work on a variety of levels, including: working with individual children and families; with schools; and with LAs ((Birch, Fredrickson, & Miller, 2015). EPs provide consultation, assessment and intervention work, utilising problem-solving models and hypothesis testing to provide appropriate levels of support (Birch et al., 2015). Therefore, EPs are in a suitable position to promote and advise on evidence-based interventions and programmes.

The current research may be helpful in providing EPs with an additional perspective of Forest School and outdoor learning. The research suggests that Maplefield Nursery provides a learning environment that has an impact on

children's social and emotional well-being and communication. What is unique about this nursery is the Forest School ethos and accessible outdoor learning opportunities, through a continuous curriculum. As noted in the previous section, it is likely that Forest School has heavily influenced the nursery's practice. Indeed, taking a slightly broader perspective – one might argue more simply that the outdoor opportunities available at Maplefield Nursery contribute to positive outcomes. This may be of interest to EPs, particularly when working with schools on a wider systemic level.

It is also hoped that this research may inspire others to undertake research in this area. The current Doctorate of Applied Educational Psychology in the UK requires Trainee Educational Psychologists (TEPs) to undertake a doctoral piece of research. Thus, TEPs and EPs are trained in research methods and have the skills to undertake quality pieces of research that add to the applied evidence base. The possible areas for further research are discussed below. TEPs and EPs have the opportunity to expand this research and attempt to address any limitations encountered.

8.13.5 Implications for Future Research

Experimental methods were employed in the current research as to provide a unique contribution and added rigour to the evidence base. The difficulties in implementing evaluations of Forest School (Harris, 2015), and the constraints and limitations of quantitative research in outdoor learning (Scrutton & Beames, 2015) have been acknowledged in the literature. The current research was difficult to design, due to the commitment to allowing Maplefield Nursery to guide the research, and because there were very few quantitative studies evaluating Forest School in which to build upon. Therefore, employing a Multiple SCED may have been a suitable compromise and may have provided an experimental element to the evidence base whilst minimising the constraints associated with pre- and post-test designs. SCEDs are not without constraints and limitations, however, it is

possible future research might usefully employ such an approach and contribute further to the growing experimental data regarding the impact of Forest School.

The current study has shown the potential use of pre- and post-test designs in evaluating Forest School. Adaptations to the current design could enhance the rigour of the research and progress the Forest School evidence base. Future research could include a comparison group, considering the impact of general outdoor learning and Forest School, against children that do not receive either of these. Although practically more challenging, utilising more than one nursery may reduce the possibility of diffusion of treatment. In this instance, confounding variables would need to be considered and the nurseries would need to be closely matched. It could also be interesting to maintain the design used in the current study, but with a nursery that does not utilise outdoor learning; Forest School could be introduced to a nursery that has had no prior involvement with it. This would obviously, however, require funding and commitment from a nursery, which brings further challenges. It might also be beneficial to repeat the current design over a longer period. As discussed previously, it may take more than 10 sessions of Forest School to identify any differences between groups. Therefore, a longitudinal study utilising experimental methods would be a welcomed contribution to the literature.

The current researcher interacted with nursery staff through focus groups, to allow them to contribute to the formulation of research questions. The strengths of this approach have been previously discussed, thus the approach may be useful to apply to all forms of educational research.

As noted, it is possible that individual learning experiences are fundamental to Forest School, making it difficult to capture its impact by grouping children. As such, qualitative research methods may be necessary in order to capture these experiences. Future research utilising qualitative methods could expand further on the commonly used data collection methods (such as interviews) and analysis procedures (such as thematic analysis) in the Forest School literature. For

example, ethnographic approaches, in which the researcher becomes immersed in the society under study (Creswell & Creswell, 2018) may add depth to the individual experiences of Forest School.

The data would suggest that the experiential outdoor learning experienced by all children at Maplefield Nursery, through the free flow curriculum, may have had a positive impact. Is it the experiential nature of this experience that had a positive impact? Or could it be other factors, such as access to the outdoors, or multi-sensory environments? Future research might consider the impact of experiential learning approaches both in and out of the classroom.

8.13.6 Researcher Insights for Future Research

The current research provides a unique attempt at evaluating Forest School that allows other researchers to see the potential for future experimental research. In particular, the strengths of the current research should be utilised, such as engaging stakeholders in 'collaborative inquiry' to ensure that appropriate contextual outcomes are measured. Further to this, the mixed methods approach taken in the current research was successful in reducing some of the errors associated with using only one method. The supplementary qualitative element of the study added individual experience and contextual information which may help the reader in developing a greater understanding of the current research, thus, future research may also wish to adopt this approach. A further strength of the current research is the use of measures which have been subjected to rigorous validity and reliability tests. It is important for future researchers to think carefully about the validity and reliability of measures (e.g. scales, observations, cognitive tests), and to consider the way in which data is collected. The current research made compromises to ensure only one staff member completed the questionnaires, in order to reduce the likelihood of differing individual constructs influencing the data. The validity of data collection procedures should be considered as rigorously as the measures.

Learning can also be gained from the weaknesses identified in the current study. The lack of parental engagement compromised the research and would have added a more in depth understanding of the impact of Forest School. It is not evidently clear how parents could be encouraged to become more engaged, however, it is perhaps noteworthy that parents that were engaged in the current research had more direct interactions with the researcher. If time permits, researchers could provide initial parent workshops, to offer information on the research, and data collection workshops could be undertaken, if appropriate. The researcher's presence at the research site and being available to parents appears to be important. The current study attempted to minimise any threats to internal validity, but as with most real-world research, compromises had to be made in order to ensure the research took place. Diffusion of treatment was a possible reason for the results indicating significant effects for both the control group and experimental group. This perhaps shows the need for more than one setting to be used in research of this type. However, if more than one setting is used, researchers need to be wary of the potential for confounding variables. In instances where threats to validity occur, this should be noted and addressed in the reporting of the research, as has been done in the current study. This is not evident in previous Forest School research, however, this transparency allows readers to consider the impact of the research and highlights the potential areas that may compromise future research.

It was evident from the literature review (See Chapter 2) that there were reoccurring limitations in the existing research on Forest School, across both quantitative and qualitative research. It is important that these limitations are considered by future researchers as potential areas to develop and strengthen to ensure progression of the evidence base for Forest School and outdoor learning approaches.

One limitation that researchers may encounter is the lack of a Forest School 'model' within the UK, particularly due to the wide range of training providers that offer varying forms of Forest School training (Leather, 2018). This leads to questions regarding what Forest School is and why is it different. In order to

address this issue, researchers should provide detailed descriptions of the Forest School interventions under investigation and consider undertaking fidelity checks. Knight (2018) noted that sometimes research does not clearly indicate that it is examining Forest School, even when it is, and that some research may be claiming to be investigating Forest School without questioning its fidelity. This was clear from the systematic review (See Section 2.9), as the details provided regarding the Forest School intervention under investigation were extremely varied. In some instances, no details or very basic details of the intervention were provided, making it difficult for the reader to consider the validity or reliability of the study. This accompanied by limited information regarding how many sessions/hours the children engaged in Forest School, make it extremely difficult not only to compare the research but to generalise the research to other settings or research sites.

Much of the existing research has utilised qualitative methods and taken a broad approach to measuring impact, generating a range of themes, rather than taking an outcome focussed approach. Although the individual studies have varying strengths and weaknesses, it is often the case that the outcomes generated are not widely defined or discussed. Thus, it is difficult to consider what the stated area of impact actually is, for example, many studies suggest impact in the area of 'social skills' without identifying what this means. This is not just a limitation of qualitative research, the previous quantitative outcome focussed research is also vague in the outcomes under investigation. Although these studies tend to indicate which scales have been used, it is not always clear what the constructs being measured are. In order to address this issue, research should include details regarding the specific measures used, and if applicable, copies of the questionnaires should be provided, as has been done in the current study.

Another common limitation in previous research was the lack of reporting of certain data collection procedures or analysis used. Studies indicated that data were analysed using specific methods, e.g. thematic analysis, without indicating the specific procedures. There are a range of possible ways of doing different types of data collection and analysis and without a clear indication of what has been done, a study is difficult to replicate. Thus, future research should ensure that

procedures are planned, taking into account validity and reliability, and that these are clearly highlighted in the reporting.

8.14 Dissemination of Findings

Evaluation reports were made available to the Head Teacher, FSLs, school staff and parents at Maplefield Nursery. The research and the conclusions drawn have been presented to the EPs within the LA. The EPs were also given evaluation reports which they were encouraged to share with the schools they work with. To ensure wider dissemination of findings, the researcher held a meeting with staff from the Environmental Studies Service, within the LA. This service is currently undertaking research in Forest School. As a result of this meeting, the researcher will be presenting the findings to FSLs at the 'Forest School Day' in the summer of 2018. The presentation of the current research at this event will hopefully raise questions regarding future research in the area of Forest School. It is hoped that in the future, this research will be published in an independent journal, providing a research paper that is objective and not connected with any particular association.

9 Conclusion

9.1 Unique Contribution

The current research has attempted to add experimental rigour to the Forest School evidence base. The need for experimental research is clear in the presentation of the existing literature in Chapter 2. Although some attempts have been made to add experimental evidence to the Forest School movement, these studies faced challenges and methodological limitations, which have highly compromised the validity of the conclusions drawn. Much of the existing literature has been undertaken by persons with vested interests or for publication in journals specifically promoting outdoor learning/education. The qualitative data generated in previous studies is rich in individual experience and offers some evidence as to a positive effect of Forest School. Yet, in order to be confident in the benefits of Forest School, the research methodologies used need to be widened.

The current research encountered a number of methodological limitations (See Section 8.11). However, it provides a unique attempt at evaluating Forest School, that allows other researchers to see the potential for future experimental research. It Is hoped that the research will generate a debate around Forest School research, particularly how it can be advanced.

9.2 Final Conclusion

Forest School in the UK developed through the Bridgwater College, after staff embarked on an exchange visit to Denmark and were inspired by the significance the Danish schools give to outdoor activities (Bridgwater College, 2017). Research undertaken prior to the current study has suggested that Forest School in the UK has a positive impact on children of nursery age (Mackinder, 2015; Maynard, 2007; Massey, 2005), primary age (Hughes, 2007; Murray, 2003; O'Brien & Murray,

2005) and children with SEN (Bradley & Male, 2017; Southall, 2014). The range of benefits identified include social and emotional factors, personal development, learning, access to nature and risk taking.

The current research utilised a sequential mixed methods design in order to answer questions related to the impact of Forest School. The quantitative research strand highlighted that although children in the experimental group made significant gains on the measures, so did the control group. As discussed, there are various possible reasons for these scores, such as the nursery practice, the methods used and the length of the Forest School under investigation. The case study data highlighted the range of outcomes that were experienced by three children engaging in Forest School, based on the views of two FSLs. In using activity theory to structure and analyse the data, interesting information was presented regarding the tools, rules, community and division of labour that impacted on each of the children's Forest School activity.

The use of a mixed methods approach is a strength of the current research as it diminishes the 'errors' associated with utilising only one method (Sechrebt & Sidani, 1995). The use of a control group increased the validity of the findings, although in the current research the control group may have experienced diffusion of treatment. The measurements used were established, reliable and valid tools, which supports the reliability of the study. There were, however, various threats to the internal validity of the study which need to be taken into account when considering the current findings. The low statistical power of the study should also be considered, and future research should aim to increase statistical power, such as through increasing sample sizes.

It is recognised that the nursery under investigation utilises practices which are not representative of all nurseries, thus impacting on the external validity of the data. Therefore, details of Maplefield Nursery have been provided to allow for comparisons to be made with nurseries using similar practices.

Although the experimental element of the research has resulted in the null hypotheses being retained, it has shown that those children receiving Forest School made progress in social and emotional well-being and communication. The case studies highlight these outcomes further. The control group, however, also made progress in these areas. As such, Maplefield Nursery can be confident in the approaches they adopt and the positive progress for all children, which may well be due to the Forest School ethos embedded throughout the nursery and the support provided by staff trained in Forest School. It is possible that Forest School is having an impact on a wider whole school level, irrespective of whether the children engage in the 'sessions'. Future research should aim to address the methodological limitations of the current study and expand on the mixed methods design. In particular, future research should make attempts to utilise experimental research methods to generate evidence which is outcome focussed, allowing for evidenced based conclusions to be added to the Forest School literature.

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11 Appendices

Appendix 1: Systematic Review Search Process

Appendix 2: Ethical Approval

Appendix 3: Informed Consent Forms

Appendix 4: Study Information Sheets

Appendix 5: Research Update for Parents

Appendix 6: Debrief Sheets

Appendix 7: Focus Group Structure

Appendix 8: Focus Group Outcomes

Appendix 9: Review of Literature for Outcome Measures

Appendix 10: Pilot Study Communication Measure

Appendix 11: Pilot Study Data

Appendix 12: Fidelity Observations

Appendix 13: Timeline of Forest School Sessions and Data Collection

Appendix 14: Questionnaire used in Current Research

Appendix 15: QQ Plots

Appendix 16: Histograms

Appendix 17: Raw Data

Appendix 18: Interview Questions

Appendix 19: Notation System used for Interview Transcripts

Appendix 20: Diary Format

Appendix 21: Interview Transcriptions (Maisie)

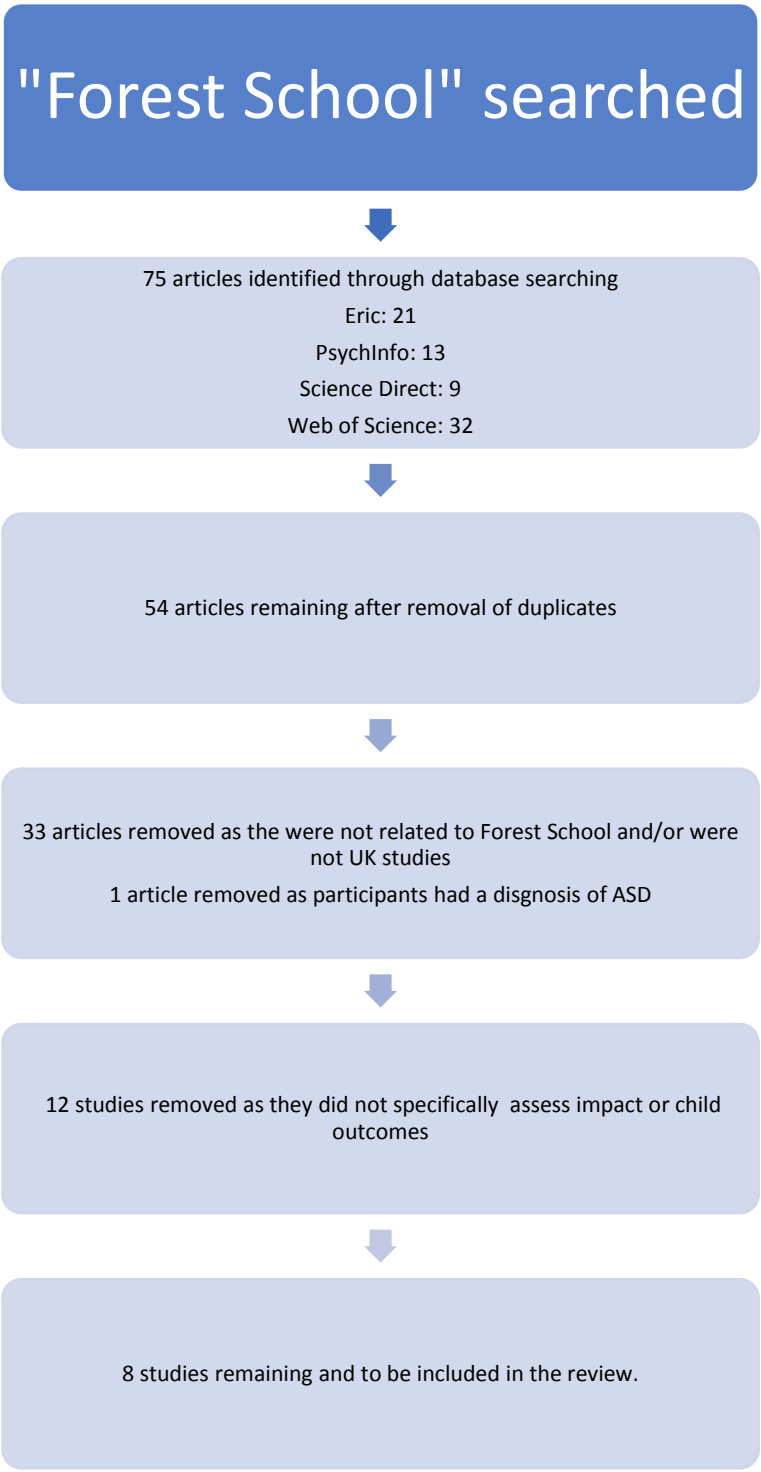
Appendix 22: Example Diary Analysis

Appendix 23: Interview Data Analysis (Maisie)

Appendix 24: Tables of Extracts for each Node of Activity Triangle (Maisie)

Appendix 25: Further Discussion of the Nodes of the Activity Triangles

Appendix 1: Systematic Review Search Process



Appendix 2: Ethical Approval

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

School of Psychology
The University of Nottingham
University Park
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NG7 2RD
T: +44 (0)115 8467403 or (0)115 9514344

SJ
Ref: S951R

Monday, 27 March 2017

Dear Nathan Lambert and Harriet Cooper,

Ethics Committee Review

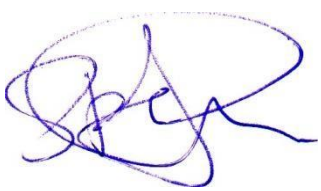
Thank you for submitting an account of your proposed research 'An Evaluation Of Forest School For Nursery Aged Children'.

That proposal has now been reviewed by the Ethics Committee and I am pleased to tell you that your submission has met with the committee's approval.

Final responsibility for ethical conduct of your research rests with you or your supervisor. The Codes of Practice setting out these responsibilities have been published by the British Psychological Society and the University Research Ethics Committee. If you have any concerns whatever during the conduct of your research then you should consult those Codes of Practice. The Committee should be informed immediately should any participant complaints or adverse events arise during the study.

Independently of the Ethics Committee procedures, supervisors also have responsibilities for the risk assessment of projects as detailed in the safety pages of the University web site. Ethics Committee approval does not alter, replace, or remove those responsibilities, nor does it certify that they have been met.

Yours sincerely



Professor Stephen Jackson
Chair, Ethics Committee

Appendix 3: Informed Consent Forms

School of Psychology Parental Consent Form

An Evaluation of Forest School for Nursery Aged Children

Ethics Approval Number: S951R

Researcher: Harriet Cooper
lpxhmg@nottingham.ac.uk

Supervisor: Nathan Lambert
lpanl@exmail.nottingham.ac.uk

The participant should answer these questions independently:

- Have you read and understood the participant information sheet? YES/NO
- Have you been given an opportunity to ask questions and discuss the study? YES/NO
-
- Have questions been answered satisfactorily? YES/NO
- Have you received enough information about the study? YES/NO
- Do you understand that you are free to withdraw your child from the study: at any time? YES/NO without giving a reason? YES/NO
- I give permission for my child's data from this study to be shared with other researchers provided that my anonymity is completely protected. YES/NO
- Do you agree for staff to complete questionnaires in relation to your child and to keep diary recordings of the sessions? Any data will be made anonymous, locked away and destroyed after analysis. YES/NO
- Do you agree to your child taking part in this study? YES/NO

"This study has been explained to me to my satisfaction, and I agree that my child and I will take part. I understand that I am free to withdraw consent at any time"

Signature of the Participant (Parent): Date:

Name (in block capitals)

I have explained the study to the above participant and he/she has agreed to take part.

Signature of researcher: Date:

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

School of Psychology Forest
School Leader Consent Form

An Evaluation of Forest School for Nursery Aged Children
Ethics Approval Number: S951R

Researcher: Harriet Cooper
lpxhmg@nottingham.ac.uk

Supervisor: Nathan Lambert
lpanl@exmail.nottingham.ac.uk

The participant should answer these questions independently:

- Have you read and understood the participant information sheet? YES/NO
- Have you been given an opportunity to ask questions and discuss the study? YES/NO
- Have questions been answered satisfactorily? YES/NO
- Have you received enough information about the study? YES/NO
- Do you understand that you are free to withdraw from the study: at any time? YES/NO without giving a reason? YES/NO
- I give permission for my data from this study to be shared with other researchers provided that my anonymity is completely protected. YES/NO
- Do you agree to take part in this by being observed and completing questionnaires, interviews and diary recordings?
YES/NO

"This study has been explained to me to my satisfaction, and I agree I will take part. I understand that I am free to withdraw consent at any time"

Signature of the Participant: Date:

Name (in block capitals)

I have explained the study to the above participant and he/she has agreed to take part.

Signature of researcher: Date:

Appendix 4: Study Information Sheets

School of Psychology
Parental Information Sheet

An Evaluation of Forest School for Nursery Aged Children
Ethics Approval Number: S951R

Researcher: Harriet Cooper lpxhmg@nottingham.ac.uk
Supervisor: Nathan Lambert lpanl@exmail.nottingham.ac.uk
Sarah Atkinson lpasa3@exmail.nottingham.ac.uk
Contact: School of Psychology
University Park
The University of Nottingham
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NG7 2RD

This is an invitation for your child to take part in a research study on Forest School. Please take time to read the following information carefully.

I am a Trainee Educational Psychologist at the University of Nottingham, undertaking a research study on Forest School. As you may be aware, the nursery your child attends is currently a Forest School, whereby once a week children have the opportunity to engage in child led outdoor learning activities. I am writing to ask for consent for your child to be involved in this study, which aims to explore the impact of Forest School for nursery aged children. If you wold like to know more about Forest School, please feel free to contact me or my supervisors, using the details given above.

If your child will be in their third term of nursery following the Summer holidays, they will partake in the Forest School intervention. If your child is in their second term of Nursery, they will continue their usual nursery experience. All children will engage in their typical day and will all have the opportunity to take part in Forest School.

In order to establish the effects of Forest School, I would like to gain information on your child in relation to a number of outcomes. The outcomes that will be measured have been partly decided with the Forest School leaders during a focus group. We had a group discussion regarding their views on the impact of Forest Schools. Their views were combined with evidence from previous research to establish the measures for the research. Therefore, the purpose of this study is to consider whether there are measurable positive impacts in the areas of emotional well-being, relationships/social skills and communication for nursery aged children.

Information will be gained through the use of questionnaires given to school staff and possibly yourselves on three occasions; prior to the Forest School programme starting and after the 10-week Forest School programme. I will carry out observations of the children at different stages of the study. I will also be asking the Forest School leaders to record any important information during the sessions.

If you are happy for your child to participate in this study, please sign and return the consent form attached as soon as possible. All data collected will be kept confidential and used for research purposes only. It will be stored in compliance with the Data Protection Act.

If you allow your child to participate, you still have the right to withdraw them from the study at any time. All of your child's information will be confidential and names will not be included in the final written report. The finalised report and results of the study will be made available to you and the school.
If you require any further information on the study, please feel free to contact me or my supervisors, using the details given above.

If you have any complaints about the study, please contact:

Stephen Jackson (Chair of Ethics Committee)
stephen.jackson@nottingham.ac.uk

The University of Nottingham
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School of Psychology
Forest School Leader Information Sheet

An Evaluation of Forest School for Nursery Aged Children
Ethics Approval Number: S951R

Researcher: Harriet Cooper lpxhmg@nottingham.ac.uk
Supervisor: Nathan Lambert lpanl@exmail.nottingham.ac.uk
Sarah Atkinson lpasa3@exmail.nottingham.ac.uk
Contact: School of Psychology
University Park
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NG7 2RD

This is an invitation for you to take part in a research study on Forest School. Please take time to read the following information carefully.

I am a Trainee Educational Psychologist at the University of Nottingham, undertaking a research study on Forest School. As you are aware, the nursery in which you work is currently a Forest School, whereby once a week, children have the opportunity to engage in child led outdoor learning activities. I am writing to ask for consent for you to be involved in this study, which aims to explore the impact of Forest School for nursery aged children.

The children participating in the study will be in one of two groups. One group will partake in the Forest School intervention only (these will be third term pupils) whilst the other group (second term pupils) will continue their usual nursery experience. All children will engage in their typical day and will all have the opportunity to take part in Forest School.

In order to establish the effects of Forest School, I would like to gain information on pupils, in relation to a number of outcomes. The outcomes that will be measured will partly be decided with yourselves through focus group interviews at the outset of the research. We will have a group discussion regarding your views on the impact of Forest Schools. Key themes regarding the benefits of Forest School will be developed as a group and these will be combined with evidence from previous research to establish the outcome measures for the research. The themes developed will be included in the report to highlight how the outcome measures were decided.

The pupil information will then be gained through the use of questionnaires given to yourselves and parents on three occasions; prior to the Forest School programme starting and immediately after the 10-week Forest School programme. I will carry out observations of the two groups at different stages of the study. I will also be asking you to contribute to interviews, and keep a dairy, recording any important information during the sessions.

If you are happy to participate in this study, please sign and return the consent form attached as soon as possible. All data collected will be kept confidential and used for research purposes only. It will be stored in compliance with the Data Protection Act.

If you agree to participate, you still have the right to withdraw from the study at any time. All of your information will be confidential, and names will not be included in the final written report. The finalised report and results of the study will be made available to you.

If you require any further information on the study, please feel free to contact me or my supervisors, using the details given above.

If you have any complaints about the study, please contact:
Stephen Jackson (Chair of Ethics Committee)
stephen.jackson@nottingham.ac.uk

Appendix 5: Research Update for Parents

Research Update

An Evaluation of Forest School for Nursery Aged Children
Ethics Approval Number: S951R
Researcher: Harriet Cooper lpxhmg@nottingham.ac.uk
Supervisor: Nathan Lambert lpanl@exmail.nottingham.ac.uk
Sarah Atkinson lpasa3@exmail.nottingham.ac.uk
Contact: School of Psychology
The University of Nottingham
Nottingham
NG7 2RD

Thank you for consenting for your child's participation in the research. This is an investigation into Forest school - for which there is good evidence of positive benefits in the areas of Social Skills; Emotional well-being, including self-esteem and confidence; Communication; and Motivation. The outcomes that will be measured have been partly decided with the Forest School leaders during a focus group. We had a group discussion regarding their views on the impact of Forest Schools. Their views were combined with evidence from previous research to establish the measures for the research. Therefore, the purpose of this study is to consider whether there are measurable positive impacts in the areas of emotional well-being, relationships/social skills and communication for nursery aged children.

The research project is currently in its pilot phase, which is a small scale initial study conducted in order to evaluate the appropriateness of the research design. Your child is currently in their second term of nursery, accessing their usual nursery experience. After the summer holidays your child will be in their third term and will begin the Forest School Intervention. I will be continuing the research project through the autumn term and will be asking for further information in relation to your child. As noted in your initial information letter, this will be through the use of questionnaires given to school staff and possibly yourselves on three occasions; prior to the Forest School programme starting, after the 10-week Forest School programme and one month afterwards. I will also carry out observations of the children at different stages of the study and the Forest School leaders will be recording anything they feel is important during the sessions. I may interview staff in relation to your child to gain further information regarding the impact of Forest School.

You still have the right to withdraw them from the study at any time. If you require any further information on the study, please feel free to contact me or my supervisors, using the details given above.

Thank you

Harriet Cooper

Appendix 6: Debrief Sheets

School of Psychology Parental Debrief Sheet

An Evaluation of Forest School for Nursery Aged Children

Ethical Approval Number: S951R

Researcher: Harriet Cooper lpxhmg@nottingham.ac.uk
Supervisor: Nathan Lambert lpanl@exmail.nottingham.ac.uk
Sarah Atkinson lpasa3@exmail.nottingham.ac.uk
Contact: School of Psychology
The University of Nottingham
Nottingham
NG7 2RD

This was an investigation into Forest school - for which there is good evidence of positive benefits in a range of areas, including social skills, emotional well-being, motivation, behaviour and physical skills. The purpose of this study was to consider whether there are measurable positive impacts in the areas of social and emotional well-being and communication for nursery aged children.

Information was gained through the use of questionnaires given to school staff and yourselves. I carried out observations of the children at different stages of the study. The Forest School Leaders also recorded any important information during the sessions. I interviewed staff in relation to some of the children that were taking part in Forest School to gain further information regarding the impact.

Thank you for your consent and contribution to the research and for your child's participation in the research. If you would like to gain further information on the outcomes, please use the contact details above. Alternatively, [redacted] Nursery will be provided with executive summaries of the research, which will be available in the near future.

Thank you

Harriet Cooper

The University of Nottingham

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School of Psychology Parental Debrief Sheet

An Evaluation of Forest School for Nursery Aged Children

Ethical Approval Number: S951R

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Supervisor: Nathan Lambert lpanl@exmail.nottingham.ac.uk
Sarah Atkinson lpasa3@exmail.nottingham.ac.uk
Contact: School of Psychology
The University of Nottingham
Nottingham
NG7 2RD

This was an investigation into Forest school - for which there is good evidence of positive benefits in a range of areas, including social skills, emotional well-being, motivation, behaviour and physical skills. The purpose of this study was to consider whether there are measurable positive impacts in the areas of social and emotional well-being and communication for nursery aged children.

Information was gained through the use of questionnaires given to school staff and yourselves. As your child did not take part in Forest School during the research period (September 2017 – December 2017) they will either be attending Forest School currently or have the opportunity to do so in the future.

Thank you for your consent and contribution to the research and for your child's participation in the research. If you would like to gain further information on the outcomes, please use the contact details above. Alternatively, [redacted] Nursery will be provided with executive summaries of the research, which will be available in the near future.

Thank you

Harriet Cooper

The University of Nottingham

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School of Psychology Parental Debrief Sheet

An Evaluation of Forest School for Nursery Aged Children

Ethical Approval Number: S951R

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Supervisor: Nathan Lambert lpanl@exmail.nottingham.ac.uk
Sarah Atkinson lpasa3@exmail.nottingham.ac.uk
Contact: School of Psychology
The University of Nottingham
Nottingham
NG7 2RD

This was an investigation into Forest school - for which there is good evidence of positive benefits in a range of areas, including social skills, emotional well-being, motivation, behaviour and physical skills. The purpose of this study was to consider whether there are measurable positive impacts in the areas of social and emotional well-being and communication for nursery aged children.

Your child was involved in the pilot phase of this research whilst at [redacted] Nursery, which supported the development of the main study. Information was gained through the use of questionnaires given to school staff and yourselves.

Thank you for your consent and contribution to the research and for your child's participation in the research. If you would like to gain further information on the outcomes, please use the contact details above. Alternatively, [redacted] Nursery will be provided with executive summaries of the research, which will be available in the near future.

Thank you

Harriet Cooper

School of Psychology Professional Debrief Sheet

An Evaluation of Forest School for Nursery Aged Children

Ethical Approval Number: S951R

Researcher: Harriet Cooper lpxhmg@nottingham.ac.uk
Supervisor: Nathan Lambert lpanl@exmail.nottingham.ac.uk
Sarah Atkinson lpasa3@exmail.nottingham.ac.uk
Contact: School of Psychology
The University of Nottingham
Nottingham
NG7 2RD

This was an investigation into Forest school - for which there is good evidence of positive benefits in a range of areas, including social skills, emotional well-being, motivation, behaviour and physical skills. The purpose of this study was to consider whether there are measurable positive impacts in the areas of emotional well-being, relationships/social skills and communication for nursery aged children.

Thank you for your participation in the research. If you would like to gain further information on the outcomes of the research, please feel free to contact me directly. Alternatively, the nursery will be provided with executive summaries of the research, which will be available to yourselves in the near future.

You will shortly be invited to a feedback session at the nursery, where findings will be shared and discussed, and where any questions you may hold can be addressed

Thank you

Harriet Cooper

Appendix 7: Focus Group Structure

1. Introduce self and get group to introduce selves.

2. Establish ground rules:

"As we will be undertaking a group activity and contributing to a group discussion. It is important that we generate some ground rules for the group".

The suggestions from the group will be written on a board/large piece of paper that will be visible throughout the focus group.

Following this discussion if any of the following have not been suggested I will suggest they are important:

- Respect each other's opinions.
- Remain non-judgemental
- Confidentiality: anything shared should remain anonymous and confidential.
- Everyone should have a turn and the chance to voice their opinions.
- Any safeguarding issues raised, should be dealt with using the nursery Safeguarding procedure.
- Pupils should remain anonymous during the discussions.

3. Give an overview of the study and explain the purpose of the Focus Group:

"I am a Trainee Educational Psychologist at the University of Nottingham, undertaking a research study on Forest School whilst on placement with [redacted] The children participating in the study will be in one of two groups. One group will partake in the Forest School intervention only, these will be third term pupils, whilst the other group, second term pupils will continue their usual nursery experience. In order to establish the effects of Forest School, I would like to gain information on the children in relation to a number of outcomes. These outcomes will be measured prior to beginning Forest School and following Forest School. The outcomes that will be measured will be decided by examining previous research and with yourselves today. I want to involve you in this study as much as possible and as you have a good understanding and experience of Forest School, I think it is important to get your views on what we should measure".

4. Give an explanation of what will happen during the focus group:

"Firstly I will ask you to think about what you think the benefits are of Forest School for the children you work with. Then I will ask you to write down each thing you believe is a benefit on post-it notes.

Following this, we will put these together and read through them.

Together, we will try and group these into categories.

We will then try and identify a key theme for these categories, which will then be a potential measure for the research".

5. The group will be asked to think about the benefits of Forest School.

"Please think about what you think the benefits are of Forest School for the children you work with, feel free to discuss as a group".

6. The group will be asked to write down each thing they believe is a benefit of Forest School on different post-it notes.

"Please now write down these benefits in your own words, using different post-it notes for different benefits. If possible keep to 5 words or less".

7. The post-it notes will be read through by myself, to the group.

8. The group and myself will try and group these into categories.

"Now can we try and group these into categories. Areas that are similar should be grouped".

9. Once we have all the post-it notes into categories. We will try and name the category as a group.

"Can we now suggest what these categories could be labelled".

10. Once a name for each category has been decided, the focus group will be brought to a close.

"Now we have decided the areas we think would be appropriate outcome measures, I will consider these along with the research and decide on a final plan. Once this has been decided I will inform you, and we can begin collecting the pre-intervention data".

Appendix 8: Focus Group Outcomes



Appendix 9: Review of Literature for Outcome Measures

Early Years Research

Author/s	Title	Method		Outcomes
		Participants	Design	
Maynard. T	Forest Schools in Great Britain: an initial exploration (2007)	Aged 3-5 years	Interviews with three Forest School workers and data posted on the Bridgwater College Forest School website	Aims: • Self-esteem • Self-Confidence • Independence • Environmental Education
Massey. S	The benefits of a forest school experience for children in their early years (2005)	Aged 3-4 years	• Questionnaires at the beginning and end of the research time • Informal interviews and anecdotal log • Camcorder recorded observations • Involvement in timed observations • Photograph	• Personal and social development • Communication and language development • Lifelong learning

Key:

**** Outcomes related to emotional well-being

**** Outcomes related to relationships and social development

**** Outcomes related to communication and language

Author/s	Title	Method	Aims/Outcomes of Forest School/outdoor learning
FSA - Website	What is Forest School?	N/A	• aims to foster a relationship with nature • environmentally sustainable attitudes • to encourage intrinsic motivation • fostering resilient, confident, independent and creative learners • physical • cognitive • linguistic • emotional • social • spiritual aspects • build on an individual's innate motivation • positive attitudes and/or interests. • develop emotional intelligence
Ofsted	Outdoor education	An evaluation of outdoor education, with specific focus on the work of outdoor education centres. In particular, the evaluation sought to	• important contribution to students' physical, personal and social education.

	Aspects of good practice	identify good practice and the unique contribution made by outdoor education to enhancing young people's personal and social development.	• develop their physical skills. • exercising important social skills such as teamwork and leadership. • students' attitudes and achievements. • contribute to students' personal and social development. • Develop Outdoor skills e.g. reading a compass • makes them aware of potential harm and contributes towards their being able to take greater responsibility for their own and others' safety

Primary Age Research

Author/s	Title	Method		Outcomes
		Participants	Design	
Harris. F.	The nature of learning at Forest School: Practitioners' perspectives (2015)	6 cohorts of approximately 12 children each (total 72 children) all attending the same programme of 6 Forest School sessions for a half-term	Semi-Structured interviews with FSLs	• Personal, Social and Emotional Development: ➢ Team Work ➢ Social Skills ➢ Coping with challenge ➢ Developing resilience • Risk and Responsibility: ➢ Developing attitudes to risk and responsibility ➢ Learning about the natural environment ➢ Learning to use a range of tools ➢ Learning new skills • Styles of learning: ➢ Approaches to learning • Connecting with nature: ➢ Recognising and using natural things ➢ Caring for the natural world ➢ Developing a sense of place
O'Brien, L.	Learning outdoors: The Forest School approach (2009)	24 children aged from three to nine in England	On site observations using the self-appraisal template (completed by the teacher)	• Increases self-esteem and self confidence • Improves social skills • Contributes to development of language and communication skills • Improves motivation and encourages concentration • Contributes to children's knowledge and understanding • Improves physical motor skills

Ridgers, N. D., Knowles. Z. R., & Sayers. J.	Encouraging play in the natural environment: A child-focused case study of Forest School (2012)	Seventeen children (six boys, 11 girls) aged 6–7 years from one Year 2 class in a North West England primary school	At baseline and post-programme, small (two to three children) focus group discussions	• develop the participants' knowledge, interest in nature and the world around them • social skill development • confidence when interacting with the natural world • Understanding nature • Interest in nature • motor skills • leadership skills
O'Brien, L., & Murray, R.	Forest School and its impact on young children: Case Studies in Britain (2007)	24 children from 7 schools: four located in urban areas, 3 in rural areas.	Action research: Observed over 8 months – using template developed in the initial stages of the research	• Confidence • Social Skills • Language and Communication • Motivation and Concentration • Physical Skills • Knowledge and Understanding

Appendix 10: Pilot Study Communication Measure

Read the statements that follow the phrase: Does your child… and place a check mark ✓ in the box underneath the word that tells how often your child does the behaviour. Please answer each question carefully. There are no right or wrong answers. If you wish to change your answer, put an × through it and fill in your new choice. Please do not skip any items.

Does your child…	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Very Frequently**
listen attentively in a range of situations?					
listen to stories?					
accurately anticipate key events in stories?					
respond to what they hear in stories with relevant comments, questions or actions?					
give their attention to what others say and respond appropriately, while engaged in another activity?					
follow instructions involving several ideas or actions?					
answer 'how' and 'why' questions about their experiences?					
answer 'how' and 'why' questions in response to stories or events?					
express themselves effectively?					
Show awareness of listeners' needs when expressing themselves?					
use past, present and future forms accurately when talking about events that have happened or are to happen in the future?					
develop their own narratives and explanations by connecting ideas or events?					

Appendix 11: Pilot Study Data

Pre Forest School

Control Group

Child's Number	Attachment/ Relationships	Self-Regulation	Communication
14	33	19	25
15	-	-	-
16	-	-	-
17			
18	Missing	Missing	38
19	-	-	-
20	31	21	32
21	36	27	38
22	30	25	32
23	-	-	-
24	-	-	-

Experimental Group

Child's Number	Attachment/ Relationships	Self-Regulation	Communication
1	33	35	43
2	-	-	-
3	28	24	30
4	28	26	27
5	35	27	43
6	36	30	42
7	25	31	36
8	34	36	46
9	-	-	-
10	30	23	34
11	-	-	-
12	-	-	-
13	-	-	-

Post Forest School

Control Group

Child's Number	Attachment/ Relationships	Self-Regulation	Communication
14			
15			
16			
17			
18			
19			
20			
21			
22	33	Missing	39
23			
24			

Experimental Group

Child's Number	Attachment/ Relationships	Self-Regulation	Communication
1	36	36	48
2			
3			
4	31	23	39
5	36	34	47
6	36	34	47
7			
8	34	36	48
9			
10			
11			
12			
13			

Appendix 12: Fidelity Observations

Session 2

Principles from Forest School Association	Criteria	Evidence through observations	Evidence through discussions with staff
Principle 1: Forest School is a long-term process of frequent and regular sessions in a woodland or natural environment, rather than a one-off visit. Planning, adaptation, observations and reviewing are integral elements of Forest School.	• takes place at least every other week • same group of learners • over an extended period of time • encompasses the seasons		• Takes place every week • Runs for 10 weeks • Same group of learners each week
	• structure is based on the observations and collaborative work between learners and practitioners • progression of learning	• Teachers are led by children's exploration/interests	• Staff observe children in 'Earth Elves' and build on from these in Forest School
	• initial sessions establish physical and behavioural boundaries • initial observations made on which to base future programme development		• Staff use Earth Elves to get an initial understanding of the children's abilities • First Forest School session is about "exploring and seeing where they go" • During the counting cones section, staff move the children around based on their number knowledge

Principle 2: Forest School takes place in a woodland or natural wooded environment to support the development of a relationship between the learner and the natural world.	• woodland is suited to match the needs of the programme and the learners • space in which to explore and discover	• Variety of outdoor woodland spaces: trees, benches, hut, pond, bug house, outdoor kitchen, bottle greenhouse, fruit trees • Children explore the environment e.g. bug hunt	• Free Learning
	• monitoring of ecological impact and works within a sustainable site management plan • plan agreed between the landowner/ manager, the forest school practitioner and the learners	• School own the land and the children and staff are responsible for it	
	• regular personal experiences with nature in order to develop long-term, environmentally sustainable attitudes and practices in staff, learners and the wider community.	• Rainwater is collected for watering and washing hands • Children are encouraged to take care of nature e.g. “be careful with bugs”; a child picked a dandelion and staff member said “I don’t mind you picking one but remember these are homes for bugs” • ‘Granny Greenwoods Allotment’	• Weekly experience of nature through Forest School • Ethos of nursery is free flowing and outdoor learning is always accessible • Children and staff grow fruit and vegetables which they cook with
	• natural resources used for inspiration, to enable ideas and to encourage intrinsic motivation.	• Number Tree • Link story of the week to activities around the woodland	

Principle 3: Forest School aims to promote the holistic development of all those involved, fostering resilient, confident, independent and creative learners.	• experiences linked to home, work and /or school education	• Story of the week • Tapestry (an online portal) – parents can view videos and photos from the Forest School session	• 'Mass target time' – linked to what the children are learning in class • Story of the week is the children's 'hook in' – staff consolidate the link
	• aims to develop, where appropriate, the physical, social, cognitive, linguistic, emotional, social and spiritual aspects of the learner	Physical: • Continuous physical activity throughout sessions Social: • Caterpillar – team work • "11 friends today" • "Hang 11 on the tree so we don't forget how many friends we have" Cognitive: • Target time • Staff take opportunities to incorporate the curriculum e.g. counting things whilst exploring Linguistic: • Give children a voice without making them speak e.g. encouraged girl to show the picture she had taken of a spider to other children • Children are encouraged to engage and respond – staff asked lots of questions	• Forest School encourages children to share what they have found with other children

Principle 4: Forest School offers learners the opportunity to take supported risks appropriate to the environment and to themselves.	• opportunities build on an individual's innate motivation, positive attitudes and/or interests	• Children have the freedom to explore on their own • Staff input knowledge based on what the children find through exploration – learning is guided by them	• Activities are child-led • A lot of free exploration time
	• tools and fires used when deemed appropriate to the learners, and dependent on a baseline risk assessment	• Magnifying glasses used • Children climb over tree stumps etc.	• Risk assessments in place
	• follows a Risk–Benefit process managed jointly by the practitioner and learner that is tailored to the developmental stage of the learner		• Risk assessments in place
Principle 5: Forest School is run by qualified Forest School practitioners who continuously maintain and develop their professional practice.	• led by qualified Forest School practitioners, who hold a minimum of an accredited Level 3 Forest School qualification	• 2 x Level 3 trained Forest School Leaders	
	• high ratio of practitioner/adults to learners.	• 4 x adults • 11 x children	
	• practitioners and adults have relevant checks into their suitability to have prolonged contact with children, young people and vulnerable people.		• All adults DBS checked to work in the nursery or volunteer – admin keep a copy of these
	• practitioners need to hold an up-to-date first aid qualification, which includes paediatric (if	• First aid kit visible in outside space	• Forest School Leaders all trained in first aid

	appropriate) and outdoor elements		
	• policies and procedures for running Forest School and which establish the roles and responsibilities of staff and volunteers available	• Planned sessions	• Policies and procedures in place for sessions, training etc. • Planning the same for morning and afternoon sessions • Procedures are based on the number of children and the term they are in
	• practitioners are reflective and see themselves, as a learner too	• Staff engage in the activities and model skills • Staff engage in games and play • Staff able to reflect on their practice with the researcher	• Staff have an online tool where they reflect on their own practice
Principle 6: Forest School uses a range of learner-centred processes to create a community for development and learning	• learner-centred pedagogical approach is employed that is responsive to the needs and interests of learners	• Children able to provide input during story time • Children very engaged • Children are given choices and free exploration	• Staff target individual needs e.g. give a voice to a child that often does not speak
	• Practitioner models the pedagogy, promoted during programmes • careful planning, appropriate dialogue and relationship building	• Staff model tasks and skills e.g. counting leaves • Dialogue from staff is positive “well done” and encouraging • Staff encourage engagement and support those children that need additional help	

	• Play and choice are part of the learning process • play is recognised as vital to learning and development	• Play – interaction with story • Play – searching e.g. bug hunt • Games	• Children given choice "as their confidence builds children go off in different directions"
	• provides a stimulus for all learning preferences and dispositions	• All children appeared engaged	• Topic each week links to class learning • Free learning and child-led activities
	• reflective practice is a feature of each session to ensure learners and practitioners can understand their achievements, develop emotional intelligence and plan for the future	• Photos taken throughout session and viewed on whiteboard at the end of the session • Children encouraged to share their experiences with other children "tell us what you found" • During snack time, a child was given the IPad to show other children a picture of a bug she had found	• Staff take photos as evidence of learning/experiences
	• practitioner observation is an important element of pedagogy • observations feed into 'scaffolding' and tailoring experiences to learning and development	• Staff support and model tasks for children that need it	• Staff observe during Earth Elves to develop an understanding of a child's capabilities • Photos and videos are taken as a tool for observation

Session 9

Principles from Forest School Association	Criteria	Evidence through observations
Principle 1: Forest School is a long-term process of frequent and regular sessions in a woodland or natural environment, rather than a one-off visit. Planning, adaptation, observations and reviewing are integral elements of Forest School.	• takes place at least every other week • same group of learners • over an extended period of time • encompasses the seasons	Every week In all weathers 10 weeks at a time Seasons – using dry leaves for fire
	• structure is based on the observations and collaborative work between learners and practitioners • progression of learning	Progression – now fire lighting and building on what has previously been learnt
	• initial sessions establish physical and behavioural boundaries • initial observations made on which to base future programme development	See notes from first fidelity check
Principle 2: Forest School takes place in a woodland or natural wooded environment to support the development of a relationship between the learner and the natural world.	• woodland is suited to match the needs of the programme and the learners • space in which to explore and discover	See notes from first fidelity check
	• monitoring of ecological impact and works within a sustainable site management plan • plan agreed between the landowner/ manager, the forest school practitioner and the learners	Putting out fire to protect animals and environment which was explained to the children School own land
	• regular personal experiences with nature in order to develop long-term, environmentally sustainable attitudes and practices in staff, learners and the wider community.	FSL talks about what she does at home e.g. collect pine needles for her fire

	• natural resources used for inspiration, to enable ideas and to encourage intrinsic motivation.	Twigs, bark, leaves, natural resources to make fire Use food to motivate – cooking hot dogs on the fire
Principle 3: Forest School aims to promote the holistic development of all those involved, fostering resilient, confident, independent and creative learners.	• experiences linked to home, work and /or school education	Online portal where photos are shared with families
	• aims to develop, where appropriate, the physical, social, cognitive, linguistic, emotional, social and spiritual aspects of the learner	Turn taking encouraged Children are asked questions e.g. "what can we do next?" FSL encourages children to use manners and be respectful Children are encouraged to help each other e.g. collecting the wipes the children have used to wipe their hands Physical activity encouraged "I'm cold" – "step outside the logs and do star jumps to warm your body up".
Principle 4: Forest School offers learners the opportunity to take supported risks appropriate to the environment and to themselves.	• opportunities build on an individual's innate motivation, positive attitudes and/or interests	Food used as motivation – cooking hot dogs on the fire for snack time Counting the sausages
	• tools and fires used when deemed appropriate to the learners, and dependent on a baseline risk assessment	Fire lighting/building – after weeks of FS experience
	• follows a Risk–Benefit process managed jointly by the practitioner and learner that is tailored to the developmental stage of the learner	'Fire safety game' – walk around the outside of the logs to practice safely walking
Principle 5: Forest School is run by qualified Forest School practitioners who	• led by qualified Forest School practitioners, who hold a minimum of an accredited Level 3 Forest School qualification	2 x Level 3 FSL and 1 Trainee Teacher
	• high ratio of practitioner/adults to learners.	2 x Level 3 FSL and 1 Trainee Teacher

continuously maintain and develop their professional practice.	• practitioners and adults have relevant checks into their suitability to have prolonged contact with children, young people and vulnerable people.	See notes from first fidelity check
	• practitioners need to hold an up-to-date first aid qualification, which includes paediatric (if appropriate) and outdoor elements	First aid kit visible See notes from first fidelity check
	• policies and procedures for running Forest School and which establish the roles and responsibilities of staff and volunteers available	See notes from first fidelity check
	• practitioners are reflective and see themselves, as a learner too	
Principle 6: Forest School uses a range of learner-centred processes to create a community for development and learning	• learner-centred pedagogical approach is employed that is responsive to the needs and interests of learners	FSLs see what the children know and teach based on their knowledge already Children wrote on the fence with cooled charcoal from the fire
	• Practitioner models the pedagogy, promoted during programmes • careful planning, appropriate dialogue and relationship building	Modelling of preparing a fire and starting a fire Dialogue – talking about materials, teaching about 'dry or wet sticks' Exploring the sticks after the fire has gone out – teaching of 'burnt'
	• Play and choice are part of the learning process • play is recognised as vital to learning and development	Children find materials to build a fire
	• provides a stimulus for all learning preferences and dispositions	

	• reflective practice is a feature of each session to ensure learners and practitioners can understand their achievements, develop emotional intelligence and plan for the future	All children sit and reflect on the session together – used photos from IPad and children are encouraged to talk about the photo and what they were doing
	• practitioner observation is an important element of pedagogy • observations feed into 'scaffolding' and tailoring experiences to learning and development	Each week is based on previous learning

Appendix 13: Timeline of Forest School Sessions and Data Collection

Date	Data Collection
06/09/17 - 20/09/17	Pre-Intervention questionnaires completed by Head Teacher and Parents
26/09/17	First Forest School session Fidelity observation
03/10/17	Second Forest School session
10/10/17	Third Forest School session
17/10/17	Fourth Forest School session
31/10/17	Fifth Forest School session
07/11/17	Sixth Forest School session
14/11/17	Seventh Forest School session
21/11/17	Eighth Forest School session
28/11/17	Ninth Forest School session Fidelity Observation
05/12/17	Tenth Forest School session
05/12/17 – 19/12/17	Post-Intervention questionnaires completed by Head Teacher and Parents

Appendix 14: Questionnaire used in Current Research

Staff Questionnaire

Child's Name: _____ Gender: _____Date of Birth: _____ Age: _____Date of completion:_____

Person Completing this Form: _____ Relationship to Child: _____

This form describes a number of behaviours seen in some young children. Read the statements that follow the phrase: During the past 2 weeks, how often did the child… and place a check mark ✓ in the box underneath the word that tells how often you saw the behaviour. Please answer each question carefully. There are no right or wrong answers. If you wish to change your answer, put an × through it and fill in your new choice. Please do not skip any items.

During the past 2 weeks, how often did the child…	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Very Frequently**
act in a way that made adults smile or show interest in him/her?					
listen to or respect others?					
control his/her anger?					
show confidence in his/her abilities (for instance, say "I can do it!")?					
keep trying when unsuccessful (show persistence)?					
try different ways to solve a problem?					
seem happy or excited to see his/her parent or guardian?					
try or ask to try new things or activities?					
show affection for familiar adults?					
start or organize play with other children?					
show patience?					
ask adults to play with or read to him/her?					
share with other children?					
handle frustration well?					
show an interest in learning new things					
trust familiar adults and believe what they say?					
accept another choice when his/her first choice was not available?					
seek help from children/adults when necessary?					

cooperate with others?					
calm himself/herself down?					
make decisions for himself/herself?					
appear happy when playing with others?					
choose to do a task that was hard for him/her?					
look forward to activities at home or school (for instance, birthdays or trips)?					
show a preference for a certain adult, teacher, or parent?					
play well with others?					
remember important information?					

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The next measure takes a 'snapshot' of your pupil's skills as they are today. Some items may not apply to your pupil right now. If so, please select "Not at all like my pupil". Your pupil may begin to learn some of these skills. Please be sure to answer every item.

	Part 1	Not at all like my pupil	A little bit like my pupil	Some-what like my pupil	A fair bit like my pupil	Quite a bit like my pupil	Very much like my pupil	Exactly like my pupil
1	My pupil is comfortable when communicating.							
2	My pupil talks while playing.							
3	My pupil is willing to talk to others.							
4	My pupil is confident communicating with adults who do not know my pupil well.							
5	My pupil can communicate independently.							
6	My pupil talks a lot.							
7	My pupil can string words together.							
8	My pupil can communicate independently with other children.							
9	My pupil's speech is clear.							
10	My pupil is understood the first time when s/he is talking with other children.							
11	My pupil speaks in complete sentences.							
12	My pupil uses communication to solve problems.							
13	My pupil waits for her/his turn to talk.							
14	My pupil conveys her/his ideas with words.							
15	My pupil uses correct grammar when speaking.							
16	My pupil uses new words.							
17	My pupil uses words to ask for things.							
18	My pupil is understood the first time when talking with adults who do not know my pupil well.							
19	My pupil can tell adults who do not know my pupil well about past events.							
20	My pupil uses language to communicate new ideas							
21	My pupil can communicate independently with adults who do not know my pupil well.							
22	My pupil can talk to other children about what s/he is doing							
23	My pupil can concentrate on the task at hand.							

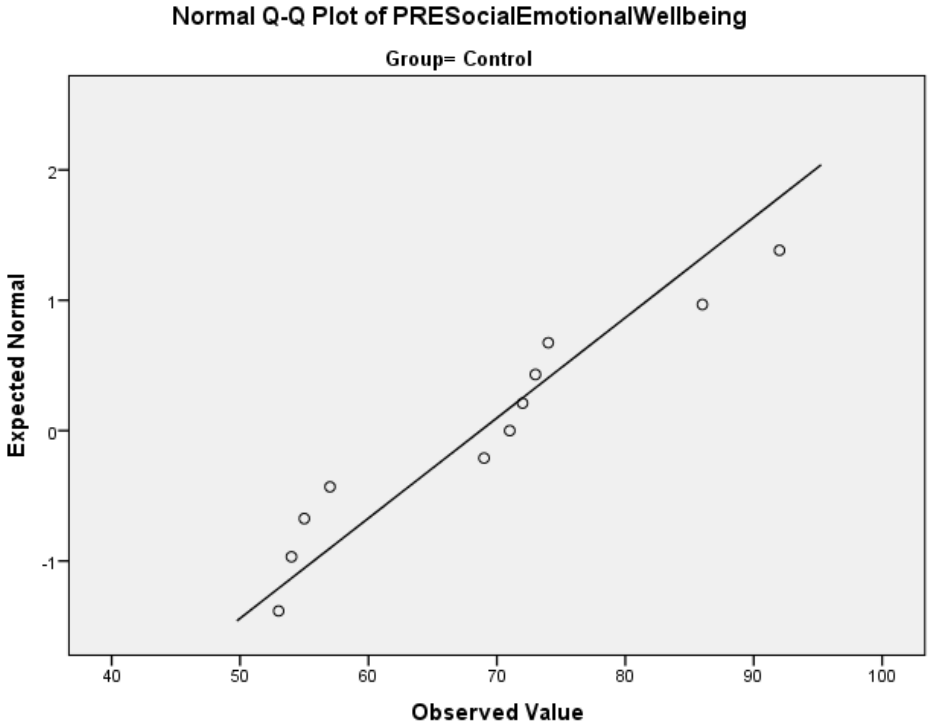
Definitions: "Talks", "tell", "speaks", "speech" and "words" refer to verbal speech for example "My pupil talks a lot". "Communicating", "conversations", "participates" and "ask" can be any form of communication. For example "My pupil can communicate independently with other children". Please note that there is one exception: Part 1, #13: "My pupil waits for her/his turn to talk", where "talk" refers to all forms of communication

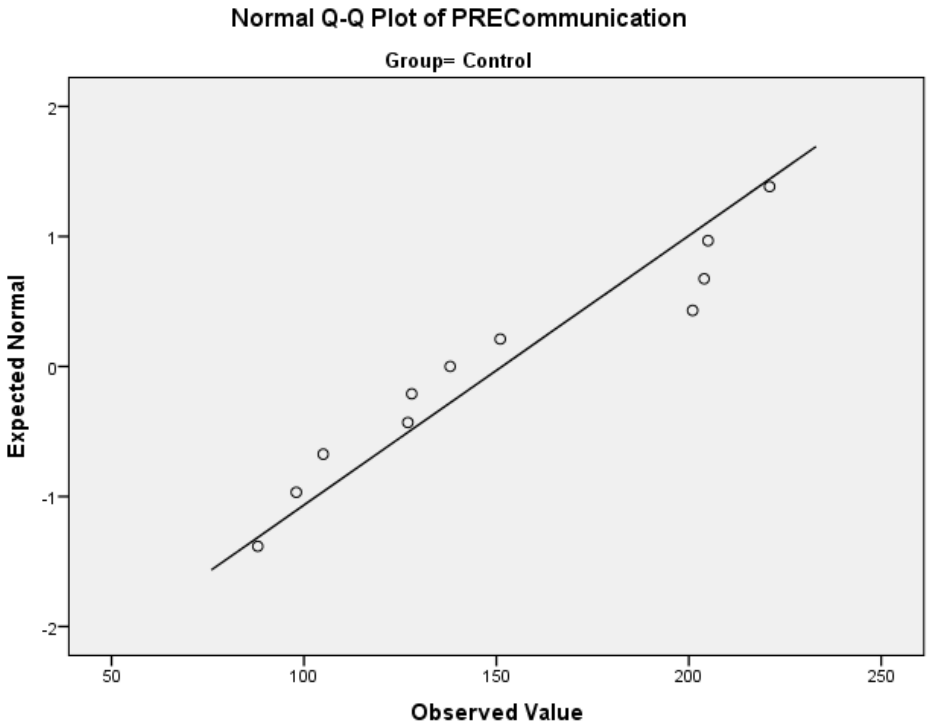
	Part 2	Can not do at all	Can do with a great deal of help	Can do with a lot of help	Can do with a bit of help	Some-times does without help	Often does without help	Can always do without help
1	My pupil can communicate effectively with adults who know my pupil well.							
2	My pupil is included in games by other children.							
3	My pupil will try to carry on a conversation with adults who do not know my pupil well.							
4	My pupil participates in group activities.							
5	My pupil can tell stories that make sense.							
6	My pupil can respond to questions.							
7	My pupil will ask for things from other children.							
8	My pupil can communicate effectively with other children.							
9	My pupil can communicate effectively with adults who do not know my pupil well.							
10	My pupil can be understood by other children.							
11	My pupil joins in conversations with her/his peers.							

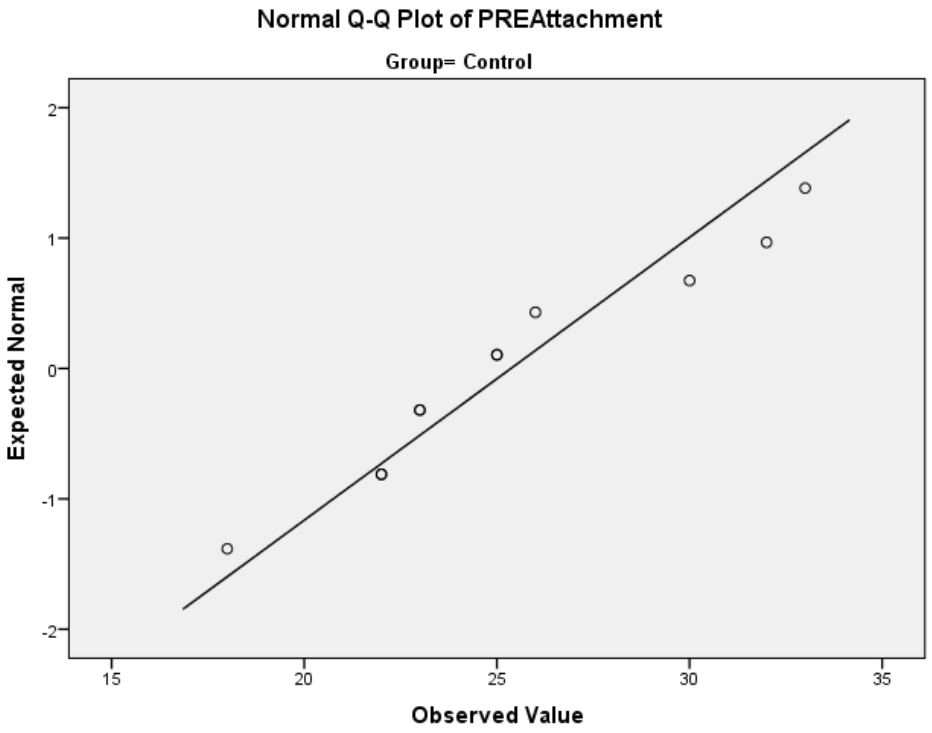
Thomas-Stonell, N., Oddson, B., Robertson, B., Walker, J. & Rosenbaum, P. (2015). The FOCUS©-34: Focus on the Outcomes of Communication Under Six. Holland Bloorview Kids Rehabilitation Hospital, Toronto, ON.

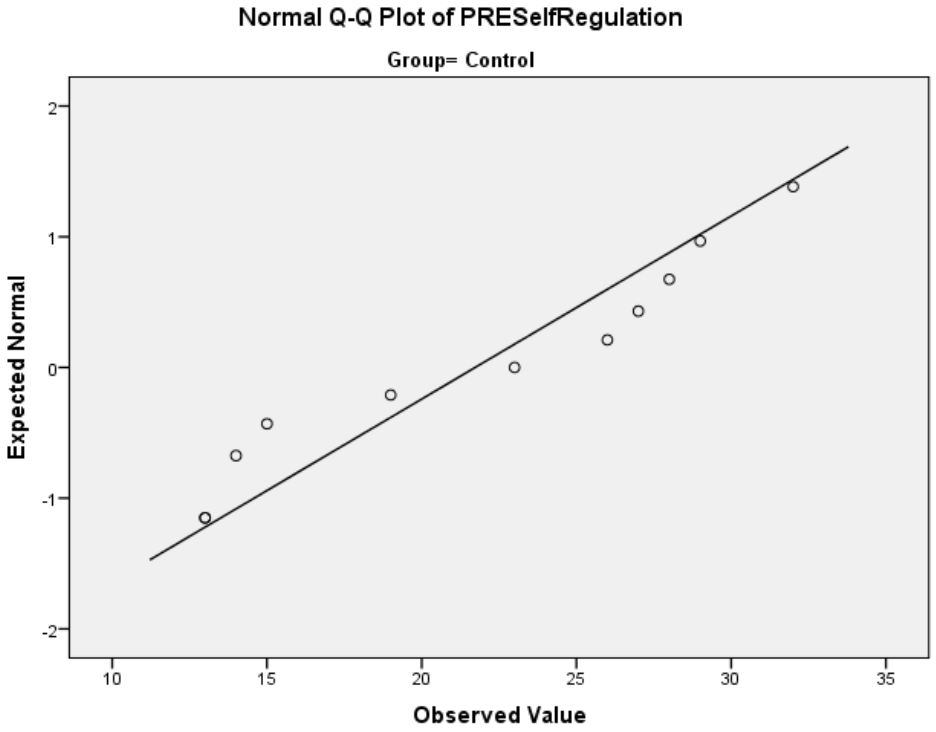
http://www.focusoutcomemeasurement.ca

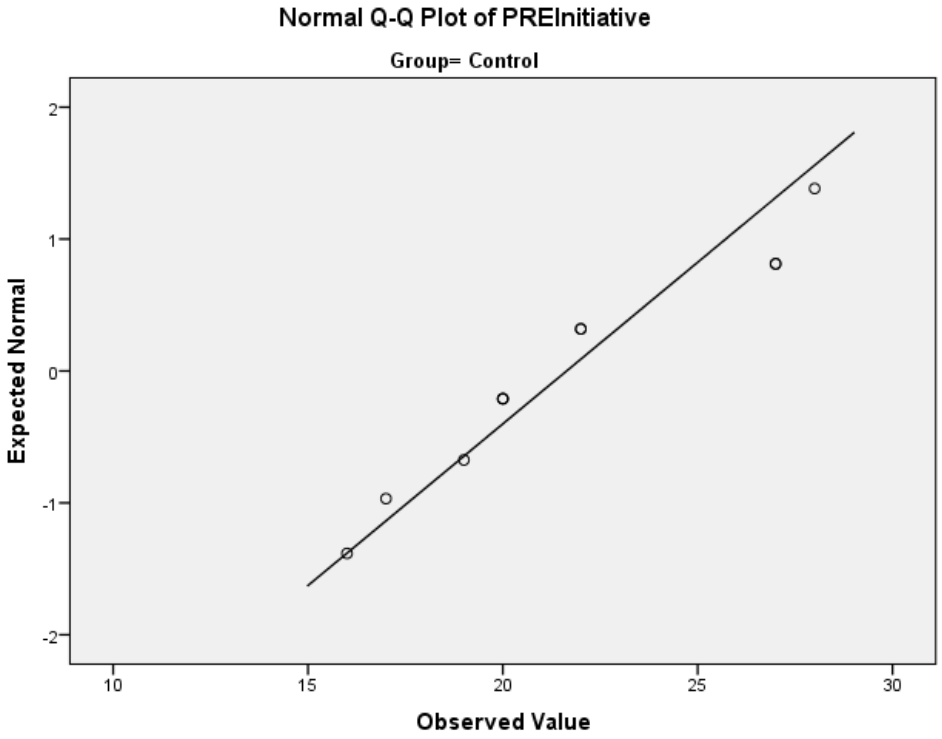
Appendix 15: QQ Plots

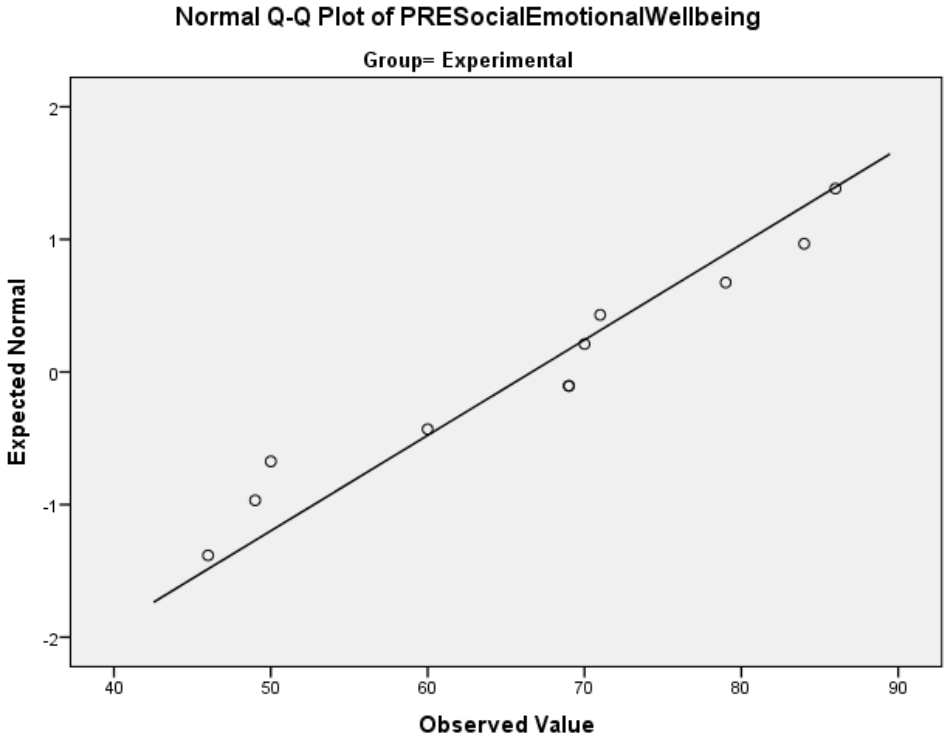


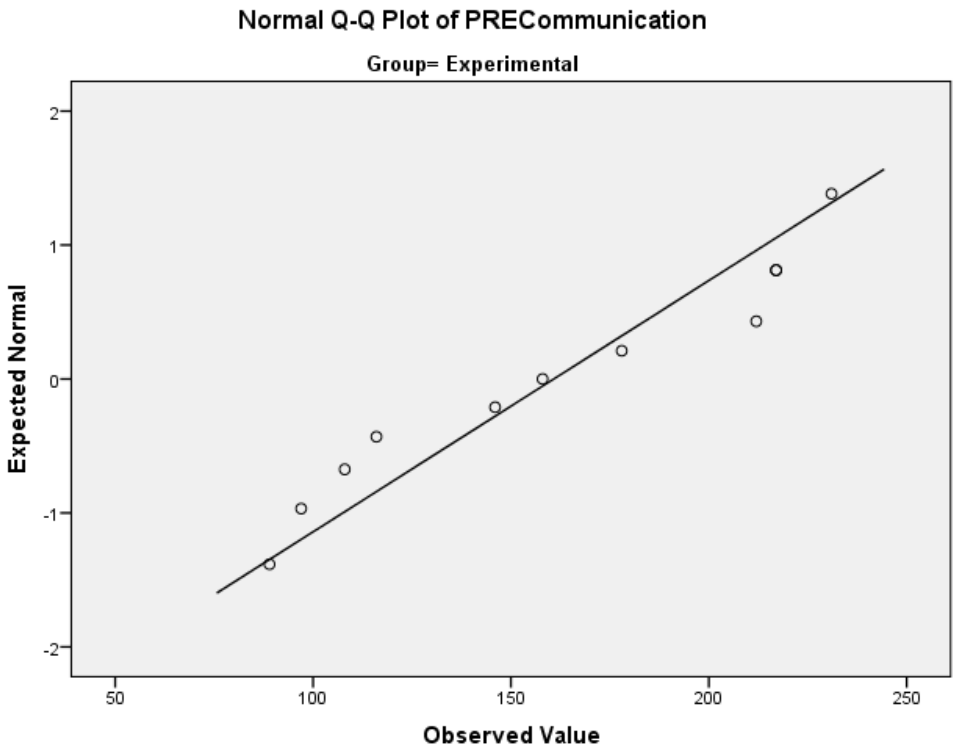


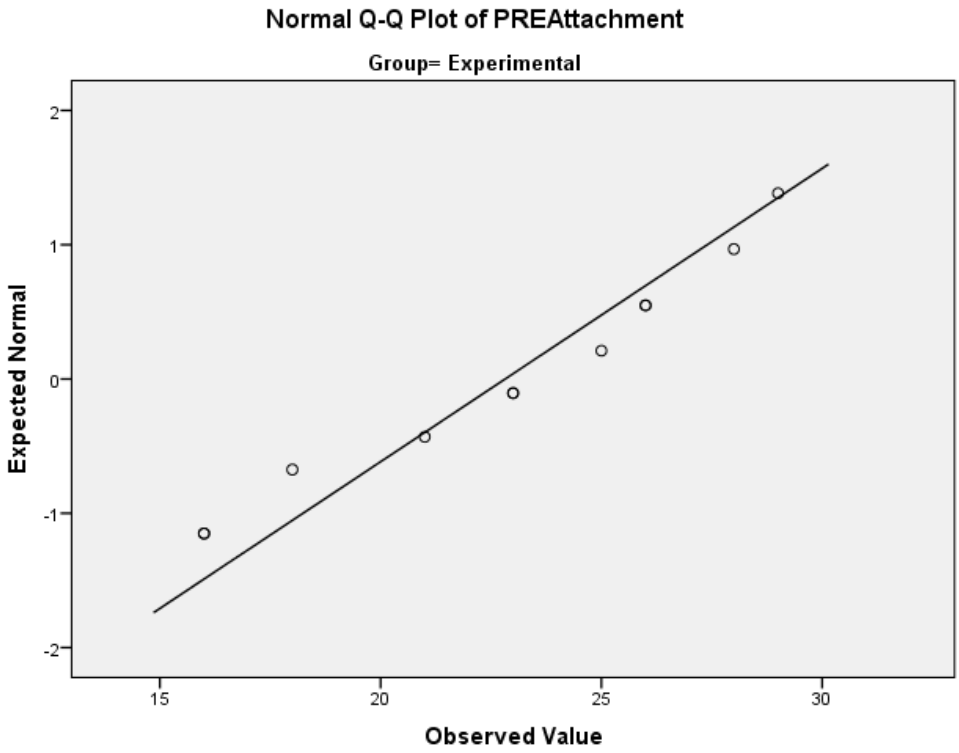

Normal Q-Q Plot of PREAttachment
Group= Control
Expected Normal
Observed Value
2
1
0
-1
-2
15
20
25
30
35

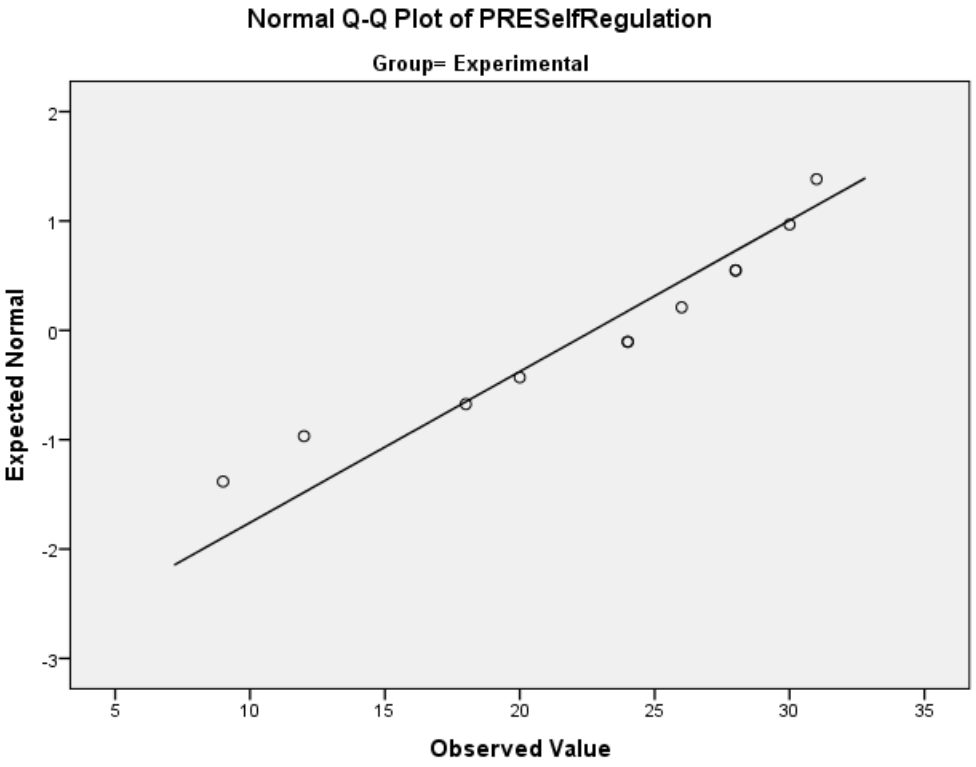

Normal Q-Q Plot of PRESelfRegulation
Group= Control
Expected Normal
Observed Value
2
1
0
-1
-2
10
15
20
25
30
35

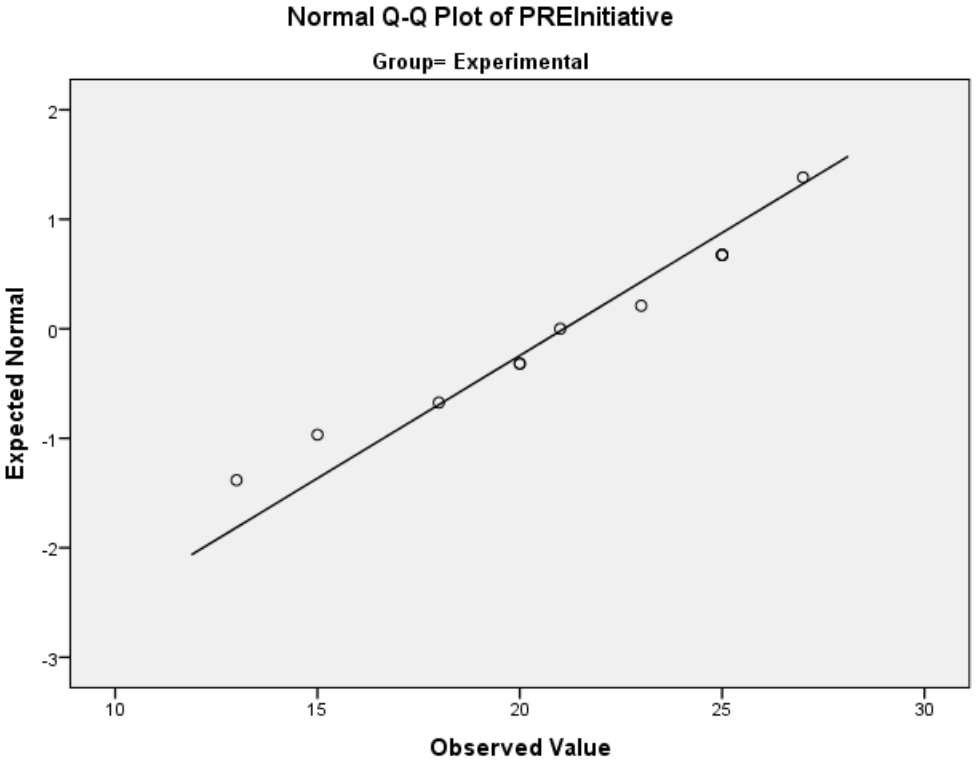

Normal Q-Q Plot of PREInitiative
Group= Control
Expected Normal
Observed Value
2
1
0
-1
-2
10
15
20
25
30


Normal Q-Q Plot of PRESocialEmotionalWellbeing
Group= Experimental
Expected Normal
Observed Value
2
1
0
-1
-2
40
50
60
70
80
90

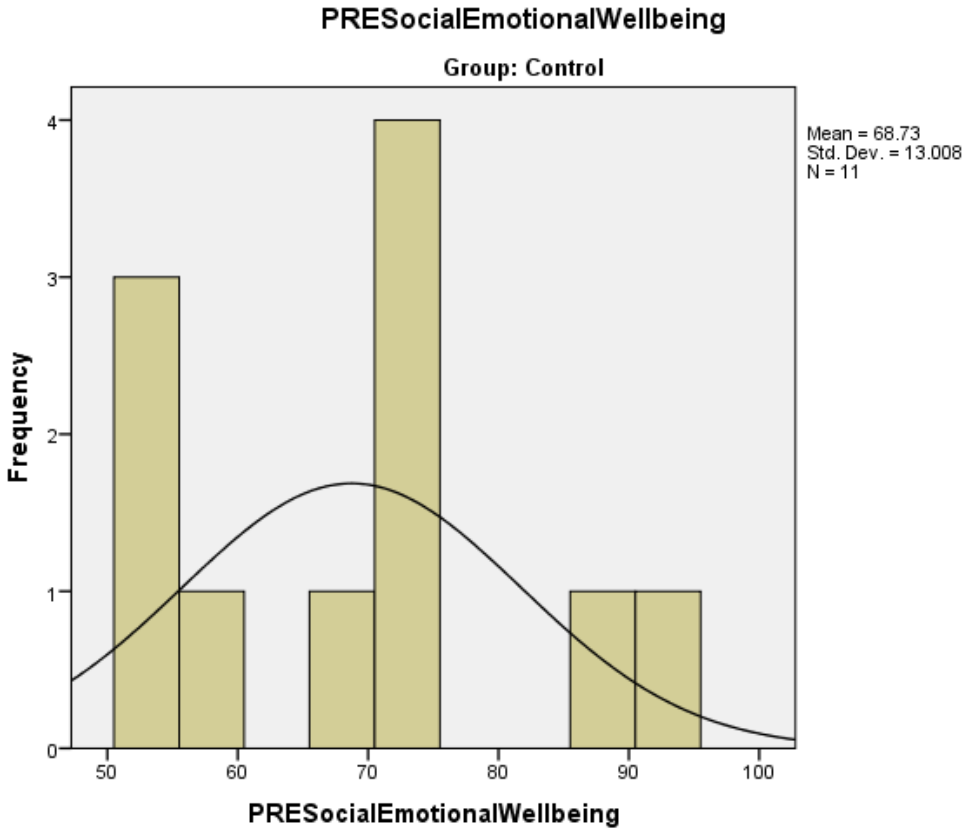

Normal Q-Q Plot of PRECommunication
Group= Experimental
Expected Normal
Observed Value
2
1
0
-1
-2
50
100
150
200
250

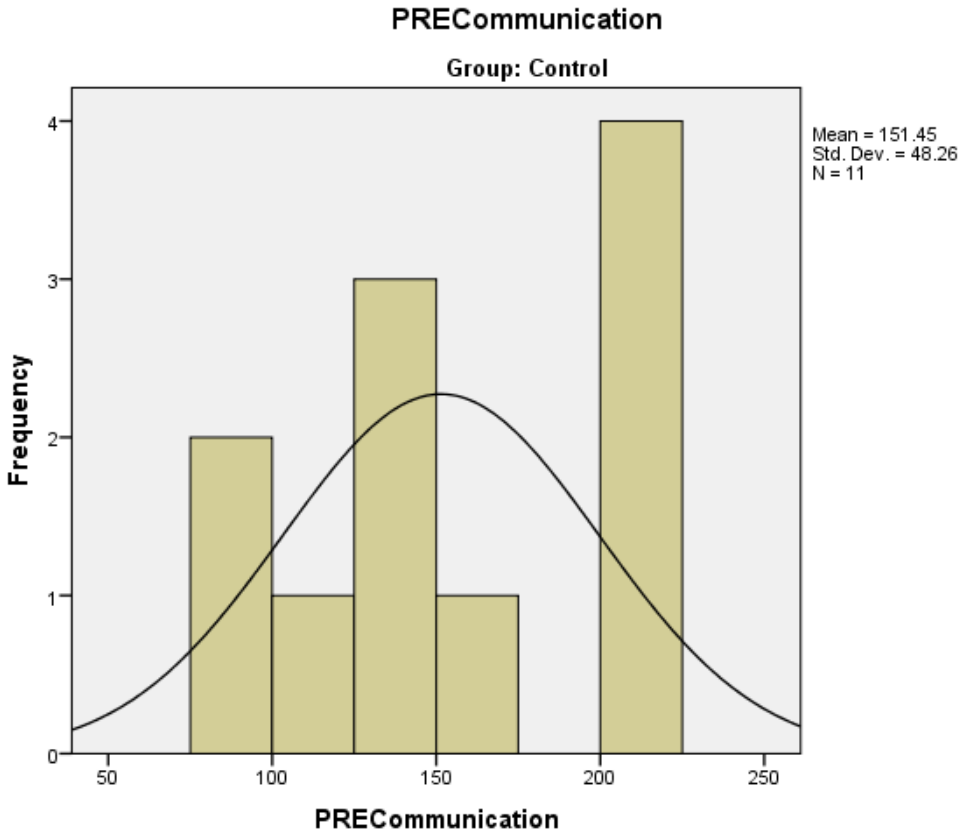

Normal Q-Q Plot of PREAttachment
Group= Experimental
Expected Normal
Observed Value
2
1
0
-1
-2
15
20
25
30

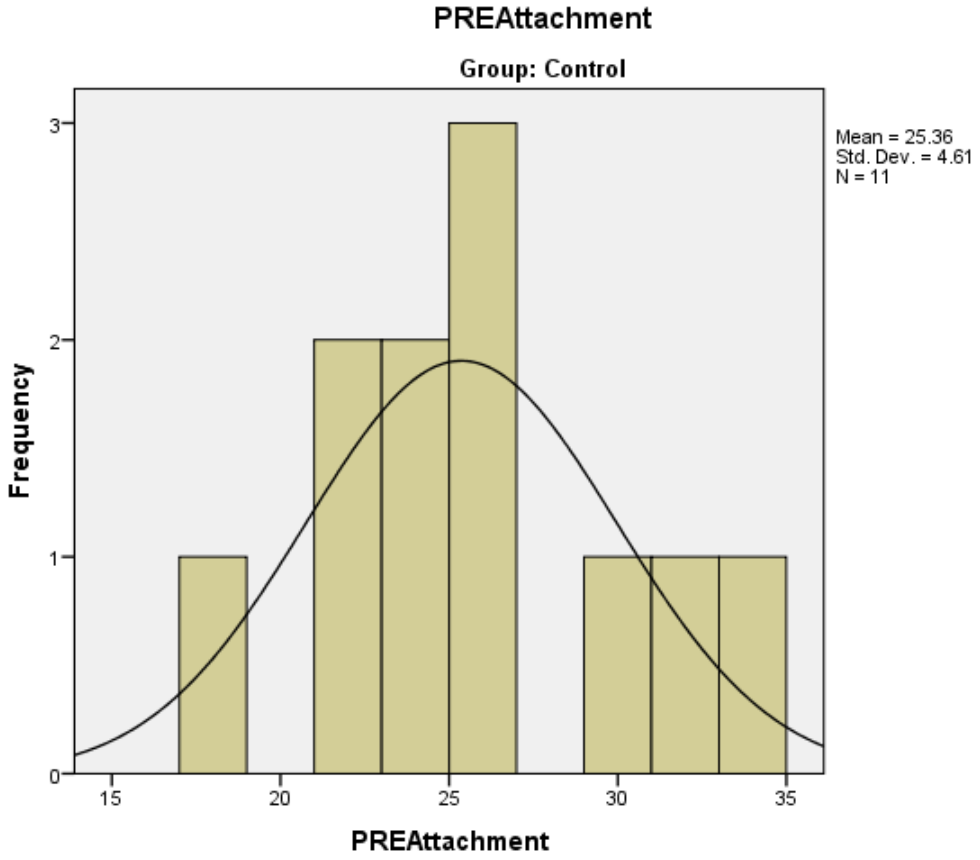

Normal Q-Q Plot of PRESelfRegulation
Group= Experimental
Expected Normal
Observed Value
2
1
0
-1
-2
-3
5
10
15
20
25
30
35

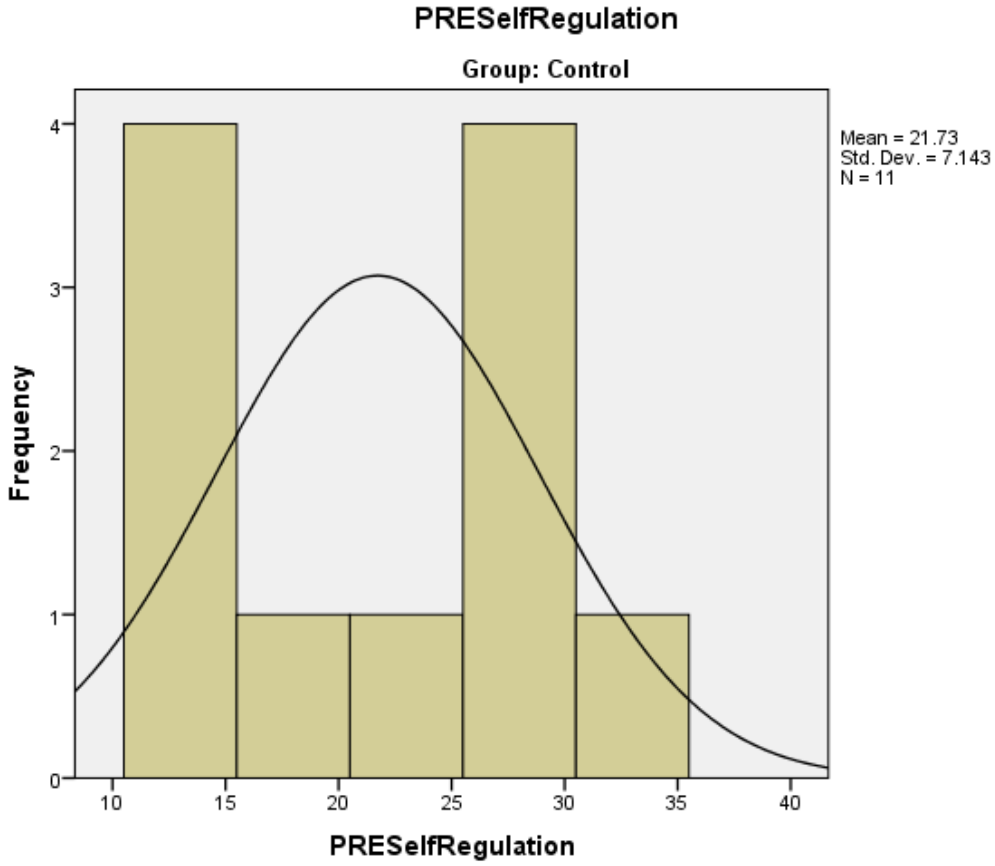

Normal Q-Q Plot of PREInitiative
Group= Experimental
Expected Normal
Observed Value
2
1
0
-1
-2
-3
10
15
20
25
30

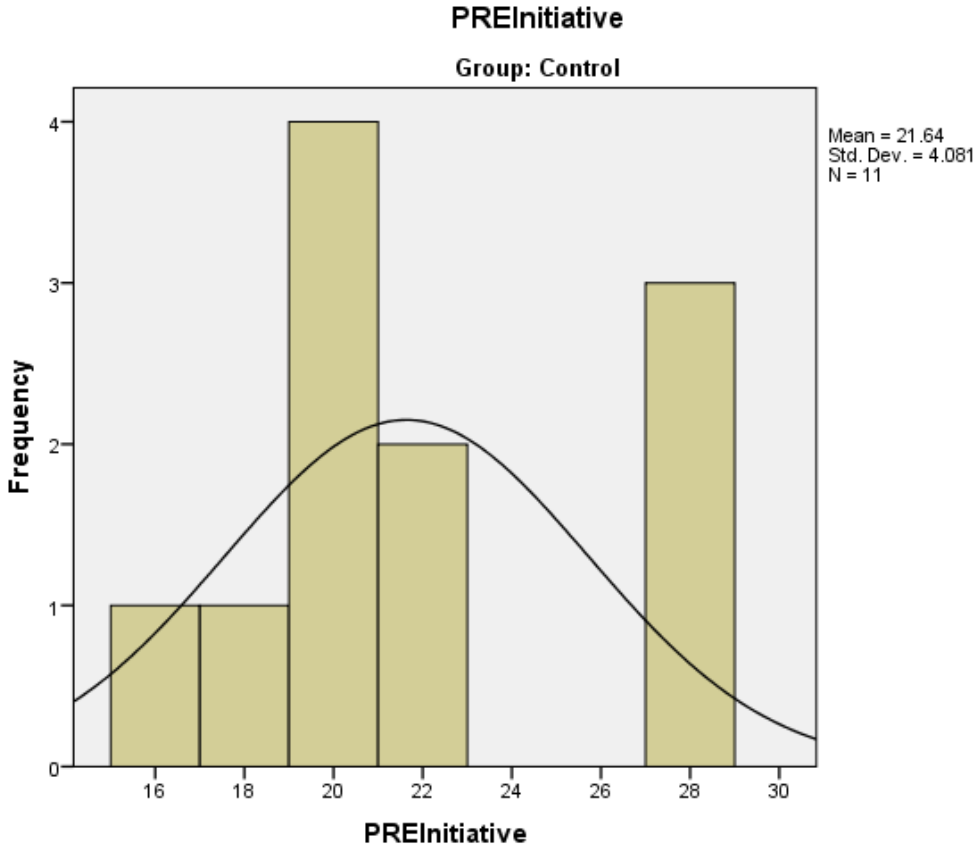
Appendix 16: Histograms

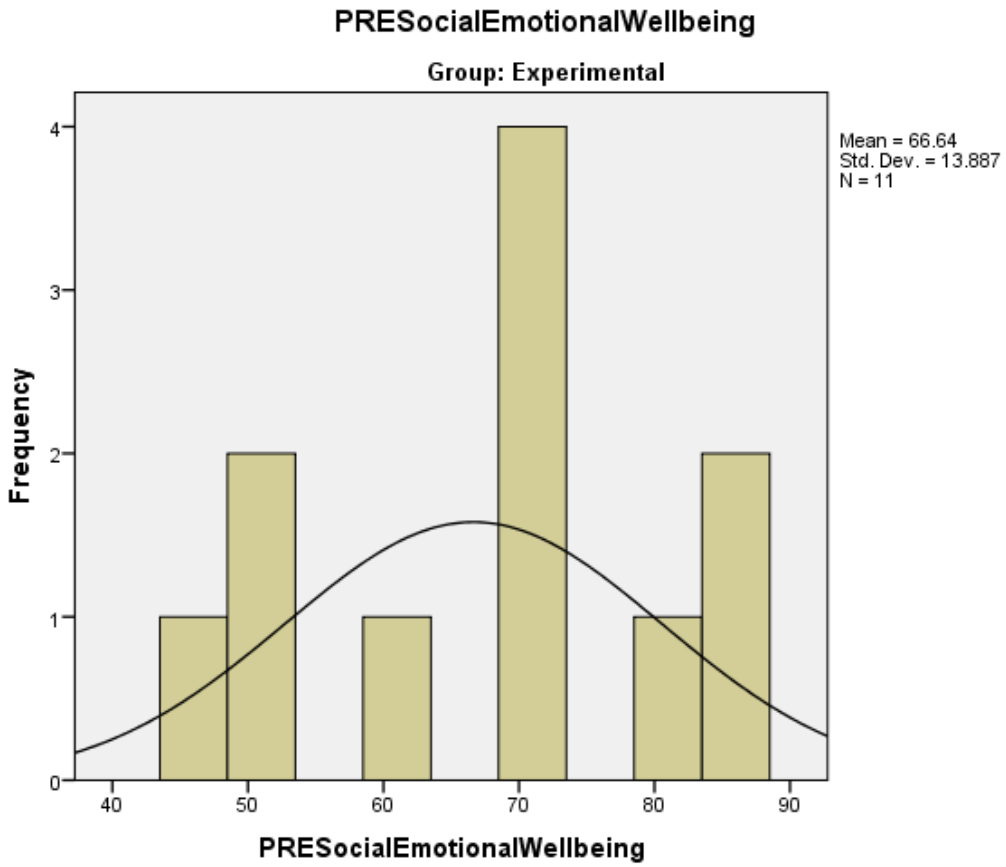


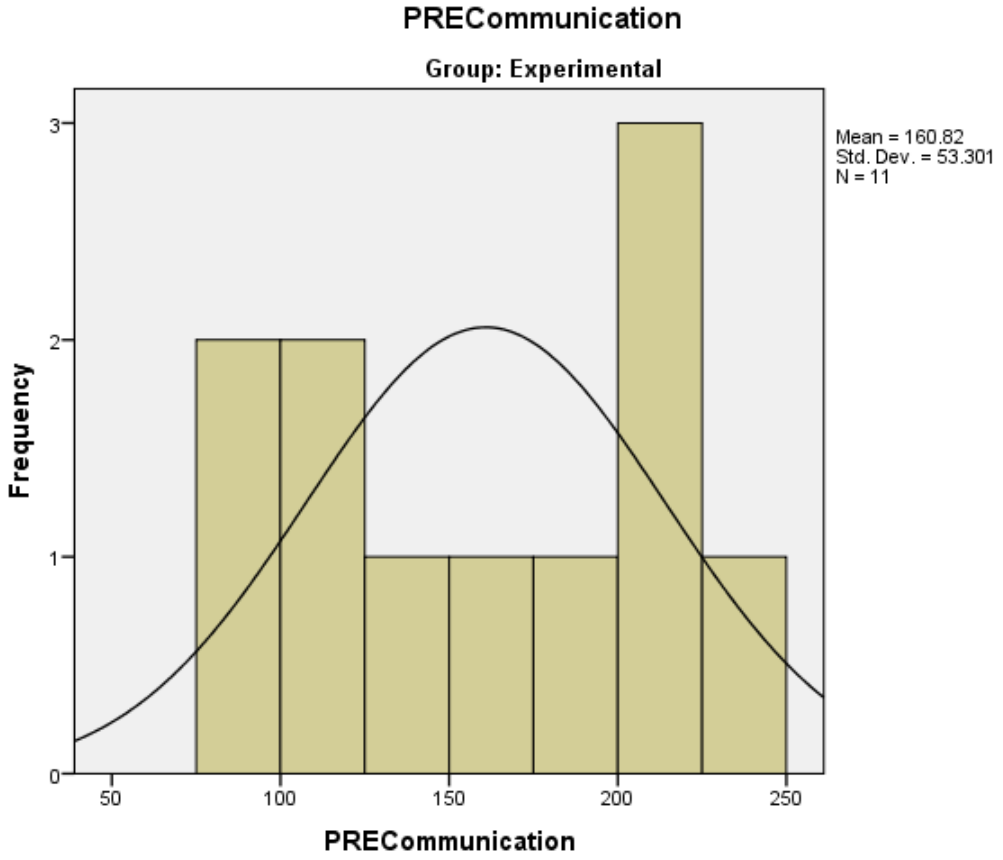


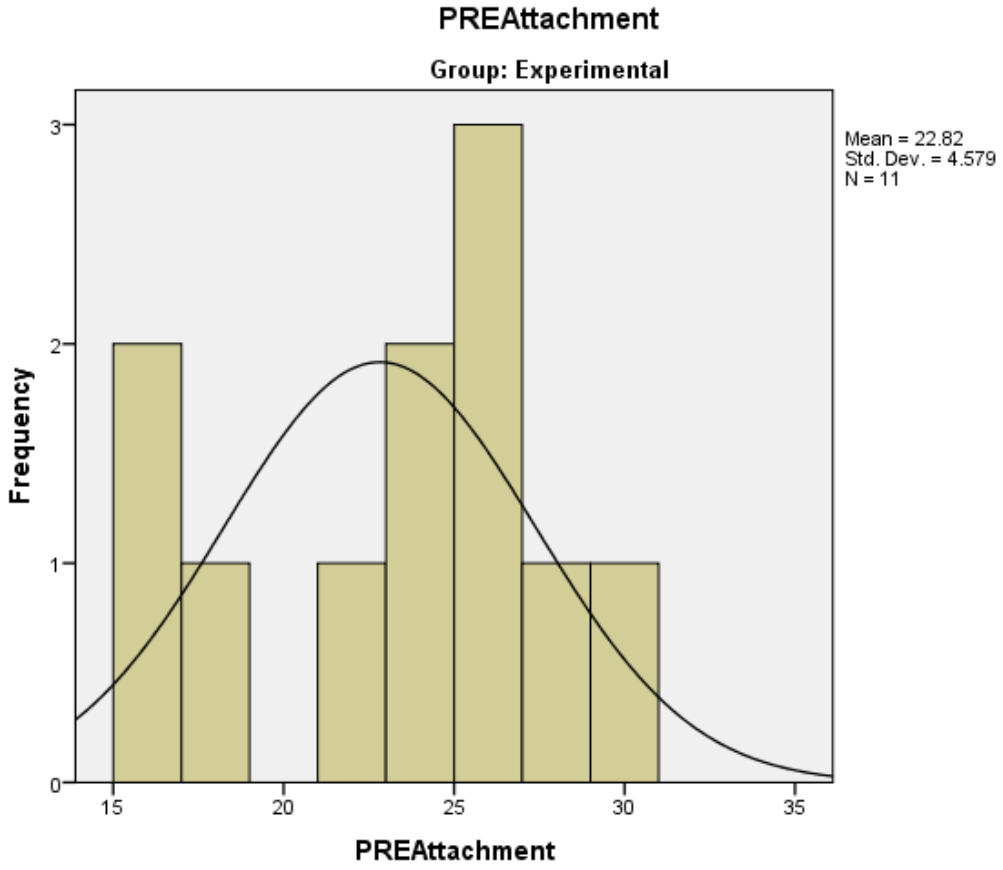

PREAttachment
Group: Control
Mean = 25.36
Std. Dev. = 4.61
N = 11
Frequency
PREAttachment

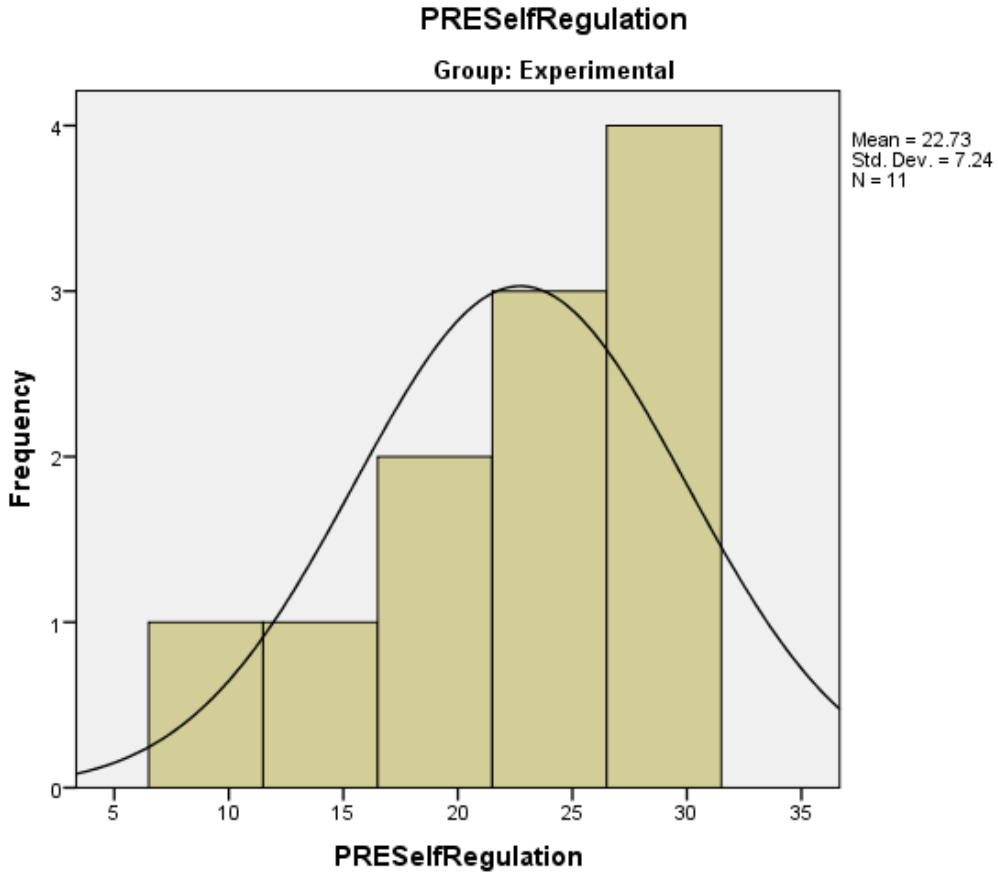

PRESelfRegulation
Group: Control
Mean = 21.73
Std. Dev. = 7.143
N = 11
Frequency
PRESelfRegulation

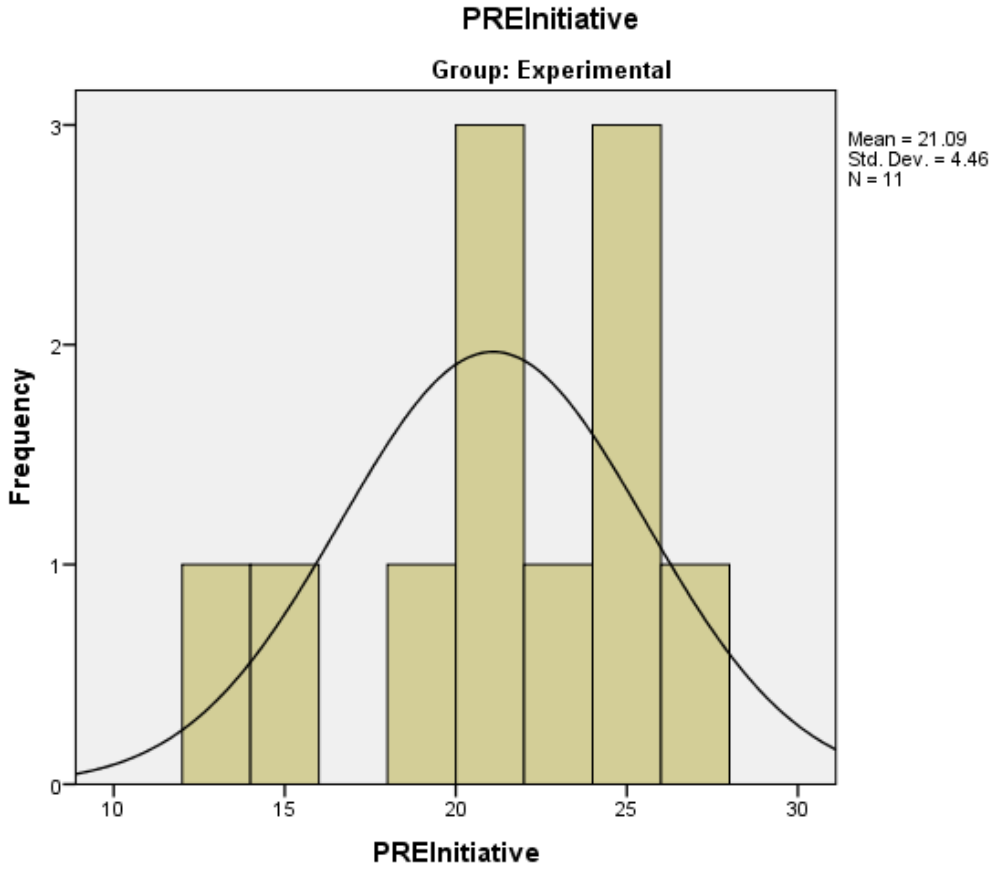

PREInitiative
Group: Control
Mean = 21.64
Std. Dev. = 4.081
N = 11
Frequency
0
1
2
3
4
16
18
20
22
24
26
28
30
PREInitiative


PRESocialEmotionalWellbeing
Group: Experimental
Mean = 66.64
Std. Dev. = 13.887
N = 11
Frequency
0
1
2
3
4
40
50
60
70
80
90
PRESocialEmotionalWellbeing


PRECommunication
Group: Experimental
Mean = 160.82
Std. Dev. = 53.301
N = 11
Frequency
PRECommunication


PREAttachment
Group: Experimental
Mean = 22.82
Std. Dev. = 4.579
N = 11
Frequency
PREAttachment


PRESelfRegulation
Group: Experimental
Mean = 22.73
Std. Dev. = 7.24
N = 11
Frequency
PRESelfRegulation


PREInitiative
Group: Experimental
Mean = 21.09
Std. Dev. = 4.46
N = 11
Frequency
PREInitiative

Appendix 17: Raw Data

Staff questionnaire pre-intervention data

Participant Number	Social and Emotional Well-being	Communication	Attachment/ Relationships	Self-Regulation	Initiative
1	74	201	32	15	27
2	71	151	25	27	19
3	92	138	33	32	27
4	73	127	25	26	22
5	72	205	23	29	20
6	54	98	23	14	17
7	57	204	22	13	22
8	55	128	22	13	20
9	86	221	30	28	28
10	**	**	**	**	**
11	69	88	26	23	20
12	53	105	18	19	16
13	60	116	18	24	18
14	49	97	16	18	15
15	50	89	25	12	13
16	69	158	23	26	20
17	86	217	29	30	27
18	71	212	26	20	25
19	84	231	28	31	25
20	69	146	21	28	20
21	70	108	23	24	23
22	79	217	26	28	25
23	46	178	16	9	21

Staff questionnaire post-intervention data

Participant Number	Social and Emotional Well-being	Communication	Attachment/ Relationships	Self-Regulation	Initiative
1	72	223	31	17	24
2	81	216	32	22	27
3	96	184	34	32	30
4	82	225	27	28	27
5	65	200	24	20	21
6	84	190	29	26	29
7	83	235	31	20	32
8	91	214	34	24	33
9	104	234	35	35	34
10	**	**	**	**	**
11	95	185	31	32	32
12	56	142	18	20	18
13	69	164	22	27	20
14	80	186	27	27	26
15	71	185	29	15	27
16	83	211	29	28	26
17	100	229	32	35	33
18	82	221	27	24	31
19	76	237	28	21	27
20	82	227	27	30	25
21	72	178	27	24	21
22	73	181	27	25	21
23	68	206	21	21	26

Parent questionnaire pre-intervention data

Participant Number	Social and Emotional Well-being	Communication	Attachment/ Relationships	Self-Regulation	Initiative
1	X	X	X	X	X
2	77	180	31	21	25
3	X	X	X	X	X
4	96	180	33	31	32
5	X	X	X	X	X
6	85	186	33	22	30
7	79	215	34	21	24
8	80	119	32	22	26
9	69	169	26	20	23
10	**	**	**	**	**
11	84	184	33	26	25
12	78	168	32	20	26
13	X	X	X	X	X
14	X	X	X	X	X
15	82	185	33	22	27
16	X	X	X	X	X
17	X	X	X	X	X
18	73	205	29	21	23
19	79	225	29	26	24
20	X	X	X	X	X
21	81	161	34	21	26
22	X	X	X	X	X
23	66	192	25	18	23

Parent questionnaire post-intervention data

Participant Number	Social and Emotional Well-being	Communication	Attachment/ Relationships	Self-Regulation	Initiative
2	80	204	30	23	27
15	88	174	35	24	29
23	81	193	29	22	30

Appendix 18: Interview Questions

Pre-intervention Interview Questions

What is (child's name) like, tell me about them?

What are (child's name) strengths?

What does (child's name) find difficult?

What are (child's name) social skills like?

What is (child's name) emotional well-being like?

What are (child's name) communication skills like?

What impact do you think Forest School might have on (child's name)?

Post-intervention Interview Questions

Could you please tell me about (child's name) time at Forest School?

Do you think Forest School has supported (child's name) emotional well-being and development?

Do you think Forest Schools has supported (child's name) social skills?

Do you think Forest School has supported (child's name) communication skills?

What aspect of Forest School do you think might have had the most impact for (child's name)?

Appendix 19: Notation system used for interview transcripts

Adapted from Braun and Clarke (2013, p. 165-166)

Feature	Notation and explanation of use
Identity of speaker; turn-taking	The speakers name followed by a colon (e.g. Laura:) signals the speakers identity; a new line is used for each speaker; capital letters are used at the start of each new turn of talk
Laughing, coughing etc.	((laughs)) and ((coughs)) signals a speaker laughing or coughing during talk
Pausing	(.) is used to signal a short pause; ((pause)) signals a longer pause (i.e. a few seconds or more)
Overlapping speech	((in overlap)) is used before the start of the overlapping speech
Inaudible speech	((inaudible)) signals the speech is completely inaudible; single parentheses around speech signals that a best guess has been made as to what was said e.g. (ways of life)
Non-verbal utterances	Phonetically and consistently common non-verbal sounds are provided, these include 'erm' 'er' 'mm' 'mm-hm'
Punctuation	Punctuation can used to signal features of spoken language, however, doing so can change the meaning of an extract of data (punctuation has not been included in the current research, other than question marks to signal questions asked by the researcher)
Reported speech	Reported speech is when an apparent verbatim account of another person's speech (or thoughts) are reported. Inverted commas are used to signal this (e.g. and she said 'look over there')
Abbreviated speech	Only the obvious and common abbreviations are signalled e.g. 'cos' instead of 'because', unless it is important for analysis purposes to fully represent how a speaker pronounces words. Mispronunciations are not corrected
Identifying information	Identifying information, such as names, occupations, place etc. can be changed. These can be changed to unmarked appropriate alternatives e.g. 'Bristol' to 'Manchester' or changed to generic descriptions indicated by square brackets e.g. 'London' to [large city]

Appendix 20: Diary Format

Forest School Diary

Have any of the children communicated and/or used language that they would not normally use?

Have any of the children engaged in team work and/or social interactions above what they would do so normally?

Have any of the children exhibited emotions? If so, what emotions and how were these displayed/managed?

Has Tyler done anything during the Forest School session that surprised you?

Has Maisie done anything during the Forest School session that surprised you?

Has Sam done anything during the Forest School session that surprised you?

Appendix 21: Interview Transcriptions (Maisie)

Pre-intervention interview

FSL: How much do you want me to say, just a (.) just a taster
Researcher: Yeah just a bit about them
FSL: ((in overlap)) Yeah ok
Researcher: So erm
FSL: Cos otherwise I'll talk all afternoon
Researcher: ((laughs))
FSL: So just enough for you to get (.) an idea about who they are
Researcher: ((in overlap)) an idea of who they are
FSL: Yeah
Researcher: ((in overlap)) Yeah
Researcher: So the first question was what is Maisie like? Just (.) describe her to me
FSL: ((in overlap) Ok so Maisie is one of two children she's the youngest [redacted] (.) lives at home with Mum and Dad (.) erm (.) [redacted] (.) and when Maisie first came to nursery Maisie was incredibly shy erm she's one of my Faere Leavers children
Researcher: Yeah
FSL: Erm so I have been looking very closely at her in involvement levels and her (.) erm her levels of well-being as well erm and for the first term those levels were really low
Researcher: Yeah
FSL: Because emotionally she was insecure (.) she was very shy (.) she was a little bit upset erm she wasn't able to motivate herself erm and needed lots of support (.) erm the second term that I observed those things she she'd started to find more confidence and she was starting to actually erm interact more independently and started to join in group play a little bit
Researcher: Yeah
FSL: I think she's happier outside (.) she likes to be outside which is (quite) why Forest Schools is brilliant for her
Researcher: Yeah
FSL: Erm (.) I think because of the summer holidays (.) she's gone back a little bit (.) erm because we've reverted to being a little bit shy and not very forthcoming
Researcher: ((in overlap)) Ok
FSL: Erm (.) but I was really pleased with her at Forest Schools this week when (.) she (.) had something to say and found her voice so that was great
Researcher: Yeah
FSL: Erm so I think (.) we're a little bit self-conscious erm ((pauses)) emotionally I think when she's out of her comfort zone she's not erm (.) you can tell in her body language and her face she's not overly comfortable so I think for Forest Schools it might take a few sessions for her (.) to actually realise (.) you know and maybe come out of herself a little bit
Researcher: Mm
FSL: Erm so that that's where she's at really
Researcher: Yeah
FSL: Ok
Researcher: We've we've covered quite a few bits already that are in the questions
FSL: ((in overlap)) Ok yeah sorry about that ((laughs))
Researcher: No no that's good what would you say her strengths are?
FSL: Erm I think her strengths are (.) show themselves much more outside (.) when she's outside she seems to find the confidence to engage (.) socially erm in (.) maybe a small game that's going on if there was say the football being (.) kicked about a bit (.) if it's something that she'd like she may (.) just go and join in a little bit erm I think inside you don't really see that as much erm ((pauses)) I think outside is (.) is (.) a strength where she feels more comfortable

Researcher: Yeah
FSL: Ok
Researcher: And in terms of (.) we've touched on it slightly but the things she finds difficult you you know can we
FSL: ((in overlap)) Err I think she finds (.) sometimes if she's not if she's out of her comfort zone sometimes she's find she finds it difficult to actually engage (.) and she's observing a little bit and hovering waiting for maybe (to invite) to invite her a little bit
Researcher: Yeah
FSL: Erm ((pauses)) you know her mum's a little bit like that as well (.) you can see the same body language in mum and Maisie and I and I know at home (.) Maisie's very outgoing and quite noisy
Researcher: Yeah
FSL: But then in the home environment (.) she already understands all those (.) you know (.) she understands the dynamics of the family (.) whereas at nursery its much busier (.) and you know there's a lot more children (.) and there's a lot going on (.) I think sometimes she's a bit overwhelmed by that
Researcher: Yeah
FSL: Yeah
Researcher: Erm (.) and in terms of her social skills you you said that you know she'll play a game when she's outside
FSL: Yeah
Researcher: Erm (.) does she ((pauses)) err what are her social skills like, if she
FSL: ((in overlap)) Erm (.) when she's feeling comfortable if you sort of watch her from afar she you can hear her chatting and engaging communication wise (.) then other at other times she doesn't want to share information at all so it depends how she's feeling
Researcher: Ok
FSL: I think it depends on how comfortable she's feeling (.) it depends on (.) whose about that she thinks actually I'd like to play with you a little bit erm she's not got a particular friend (.) err but that's quite normal in nursery she she's quite happy to play alongside erm ((pauses)) and I think you know (.) she's now moved into rainbow fish err group time which is much bigger so she's she's a little bit more comfortable in bigger groups
Researcher: Yeah
FSL: Whereas when she was in the smaller story group (.) you know she she was ok (.) but you could sense that uncomfortableness about her a little bit but I think that's something to work on with her
Researcher: Yeah is she likely to initiate (.) interactions with her peers or
FSL: Erm (.) I'm hoping that might come you know I'm hoping to perhaps observe that as Forest Schools grows
Researcher: Yeah
FSL: Erm ((pauses) I think she does a little bit but at the moment not because I think we've had the summer holidays (.) she's gone back to actually ((pauses)) 'I'm not quite sure' again but I think as the term builds on we might see that
Researcher: Yeah
FSL: That appear which would be great
Researcher: Yeah ((pauses)) and erm ((pauses)) in terms of what's her emotional well-being like so I know you said she had been quite teary and things
FSL: ((in overlap)) Yeah
Researcher: And err what is it like currently at the moment?

FSL: Erm I think currently if you observed her she's got that unsureness about her (.) erm she's not (.) she's hovering a little bit not always forthcoming to put herself forward (.) erm (.) a bit of hesitancy there

Researcher: Yeah

FSL: Erm ((pauses))

Researcher: Does she get upset at the moment, or?

FSL: No not really (.) I think I don't think she's (.) I think she's moved on from she can now leave mum much happier

Researcher: OK

FSL: Erm and I think she feels a little bit she feels more secure in the environment now

Researcher: Yeah

FSL: I think just sometimes she's not quite sure how to apply herself

Researcher: Yeah

FSL: And then when that happens you can see it in her body language that 'I don't really know what to do' erm and she's waiting for that invitation to join in really

Researcher: Yeah

FSL: Ok

Researcher: Erm and her communication skills in terms of sort of language development

FSL: ((in overlap)) Yeah

Researcher: And erm (.) communicating with yourselves and her peers err what are those skills like, are they?

FSL: Erm if she's feeling comfortable and confident you can have a two way conversation with her easily

Researcher: Yeah

FSL: Erm her clarity of language is clear her understanding is really good her listening and attention skills are really good (.) erm (.) and you know (.) if she feels like sharing something and she's relaxed enough to do that (.) that conversation will flow with a little bit of prompting

Researcher: Yeah

FSL: Erm is she's not feeling overly sure of herself (.) you need a little bit more prompting

Researcher: Right

FSL: But her communication skills are fine

Researcher: Yeah

FSL: It's just helping her to find them (.) and share them

Researcher: Ok

FSL: Ok

Researcher: Erm and finally what impact do you think the Forest School intervention will have on Maisie?

FSL: I'm hoping emotionally it will she'll settle into it really quickly she loves to be outside so it's a perfect environment for her to develop and grow (.) erm I think this week when we went it was the first time that they'd been so it's just sort of finding out (.) how Forest Schools works really (.) erm I think as a result of that (.) I think she will hopefully (.) we'll see her engaging in group games more confidently we'll see her more forthcoming with her language and her you know sharing and celebrating what she's been doing (.) erm I think it will create an environment for her to thrive I'm hoping

Researcher: Ok

FSL: Ok

Researcher: ((in overlap) Sounds good yeah

FSL: ((inaudible)) ((laughs))

Post-intervention Interview

Researcher: So could you please tell me erm (.) about Maisie's time at Forest School
FSL: Yeah right erm (.) I think Maisie is sort of in between Sam and Tyler in terms of (.) confidence
Researcher: Mm
FSL: So I think Maisie had an (.) had a little bit of confidence (.) but underlying that confidence there was also quite a bit of anxiety
Researcher: Mm
FSL: Erm (.) she's not ((pauses)) she wants to tell you things (.) but actually (.) there's almost a barrier there that (.) she finds hard sometimes to overcome a little bit
Researcher: Yeah
FSL: Erm and ((pauses)) it's about knowing Maisie and also about knowing (.) sort of the family situation with Maisie as well because actually that has an impact on how she behaves in Nursery
Researcher: Yeah
FSL: Erm because her family situation in the last (.) term has changed quite dramatically
Researcher: Right
FSL: Erm (.) we as a team have to be really sensitive to that and understand that actually that anxiety can be exacerbated by (.) what's happening
Researcher: Yeah
FSL: At home (.) erm and Lucy and I have been very sensitive to that (.) but I would say (.) you know in the process Maisie has (.) definitely gained in confidence (.) she's definitely (.) erm (.) shown (.) confidence in her social interaction she's she's gravitated towards particular friends like Sarah
Researcher: ((in overlap)) Mm
FSL: Erm that have given her a bit of inner confidence to have a go at things that probably a term ago she wouldn't even of dreamt of trying
Researcher: Yeah
FSL: Erm and the lovely thing about that is (.) that friendship (.) not just with with Maisie but err sorry not just with erm (.) Sarah but also (.) Hannah cos sometimes Maisie comes in the morning
Researcher: Yeah
FSL: And sometimes Maisie comes in the afternoon so Maisie hasn't had that (.) stability of the same group [redacted]
Researcher: Yeah
FSL: But she's established herself in the afternoon and gravitated towards Hannah in the same way that she has in the morning with Sarah and because of that (.) that has created a little friendship group for her that you can see playing out really nicely in Nursery
Researcher: Ok
FSL: So she's now (.) not only just developed that inner confidence to engage and play and have a voice in that play she's taking that into the Nursery environment she's becoming much more imaginative much more communicative erm (.) she's doing things that she wouldn't have done like she's engaging in like the Moo music dance on a Wednesday which is a really big group and she (.) if you observe her she's (.) full on
Researcher: ((in overlap)) Mm
FSL: Getting involved in that and that's something I haven't really seen before (.) so I think (.) I think both sessions have helped her and it's interesting to see her behaviour in the two different sessions because it's quite similar
Researcher: ((in overlap)) Mm
FSL: She almost needs (.) that security blanket of another friend
Researcher: Yeah
FSL: But once that that security blanket is there then all of a sudden she finds something from in herself that actually 'I can do this'

Researcher: Yeah
FSL: And that's really lovely to see (.) and the fact that she takes that further into her learning's brilliant
Researcher: So we touch you spoke about sort of her having a bit of anxiety and
FSL: ((in overlap)) Yeah
Researcher: Her confidence growing
FSL: Yeah
Researcher: Would you how else would you say It's supported her emotional (.) well-being?
FSL: Err I think it's given her the confidence to actually communicate more
Researcher: Yeah
FSL: Erm (.) she was a very quiet little girl (.) she was a little girl that (.) you know (.) you you usually have to invite to join in something
Researcher: Yeah
FSL: And you could sometimes see in her face that 'I'm not sure about that'
Researcher: Yeah
FSL: Whereas (.) I'm not seeing that as much now I can still see that anxiety sometimes because again (.) it's about understanding (.) what she's bringing with her
Researcher: Yeah
FSL: As well when she walks through the nursery doors and that's not something drastic but it's a massive change for a (.) a four-year-old
Researcher: ((in overlap)) Yeah
FSL: And ((inaudible)) sometimes depending what's happened (.) you'll get a different personality trait from Maisie but again like I've said it's about being sensitive and supporting and nurturing
Researcher: Yeah
FSL: When she's maybe having a little bit of a dip (.) erm and I think (.) you know she's done amazingly well at Forest Schools I'm very proud of her
Researcher: Yeah (.) and erm (.) in terms of her social skills so she's developed friendships
FSL: ((in overlap)) Yeah
Researcher: Through Forest School (.) erm what kind of social skills do you think (.) she might of developed (.) err specifically?
FSL: Err I think she's become much more engaged in group play (.) so group games (.) she possibly at the beginning of the process would of observed more
Researcher: Ok
FSL: Erm and now at the end of this term's process (.) she's progressed to actually (.) she wants to have a turn (.) she might need it role modelling first for her (.) but once that's happened she will (.) much more happily and confidently have a go
Researcher: Yeah
FSL: Whereas before it was a little bit 'no thank you'
Researcher: Yeah
FSL: And that's always respected (.) but you know you can see her running round and (.) you can see her engaging in the play and actually taking a more proactive part in group social play
Researcher: ((in overlap)) Yeah
FSL: Which is lovely to see
Researcher: Will she sort of initiate her involvement or does she
FSL: Sometimes
Researcher: Yeah
FSL: Sometimes I think again depending (.) where she's at emotionally (.) sometimes (.) you know maybe not in the massive group (.) but she's definitely got more of a voice in small group play

Researcher: Yeah
FSL: And you can see her bouncing ideas off and you can see her initiating different sometimes it's a little bit erm (.) there's a little bit of mischievousness about it
Researcher: ((laughs))
FSL: Which is nice to see that coming across
Researcher: ((in overlap)) Yeah
FSL: But I think (.) she's chosen friends that she knows she can bounce off really well
Researcher: ((in overlap)) Yeah
FSL: And you know she's (.) she's made great progress I'm very pleased with her
Researcher: Good (.) and erm (.) in terms of her communication skills
FSL: Mhm
Researcher: How would you say they might of developed (.) erm through the Forest School process?
FSL: Erm I think she's found her voice (.) erm I think she's found confidence to use her voice I think she's found the confidence to share (.) and engage (.) and communicate in a shared discussion
Researcher: ((in overlap)) Yeah
FSL: Which before she possibly wouldn't have done that (.) erm (.) and again I think she's taking those skills into nursery and you can see that communication with friends (.) happening more and more
Researcher: Mm
FSL: Erm (.) so she's (.) she's developing from (.) quite an (.) erm a child that (.) could be seen as being quite (.) within herself
Researcher: Mm
FSL: To actually (.) finding the confidence to bring lots of (.) skills out and share them and (.) you know (.) she wants you to be interested in her now (.) which we were before
Researcher: ((in overlap)) Yeah
FSL: But she's more willing to (.) engage in that process rather than actually (.) be a little bit more (.)
Researcher: ((in overlap)) held back
FSL: Anxious and
Researcher: Yeah
FSL: You know ((pauses)) I think she's mm (.) she's got more to say
Researcher: Yeah
FSL: Now than she had before
Researcher: That's good
FSL: Yeah
Researcher: What aspects or (.) element of Forest School do you think had the most impact for (.) Maisie?
FSL: Erm ((pauses)) I think the social side for Maisie and the confidence developing and the although she did two different groups
Researcher: Mm
FSL: Because (.) the process is very similar
Researcher: ((in overlap)) Yeah
FSL: Erm and the routine is very similar so she knows that (.) the number tree comes first then we have the story then we have the hook into the activity then off she goes and then we come back for snack
Researcher: ((in overlap)) Yeah
FSL: And then we have the plenary at the end (.) because that was constant for her (.) I think it helped her to develop really well in both groups
Researcher: ((in overlap)) Yeah

FSL: And I think (.) you know that (.) you could see (.) that (.) she relaxed into Forest Schools as the process went on

Researcher: ((in overlap)) Yeah

FSL: Whereas at the beginning she wasn't quite a bit like Sam she wasn't quite sure she wasn't as unsure as Sam

Researcher: Mm

FSL: But she wasn't quite sure and I think once (.) once children get that understanding of (.) 'this is (.) erm the this is what happens'

Researcher: Yeah

FSL: Then they start to actually (.) relax and enjoy their learning a little bit more

Researcher: Yeah so you said that sort of the consistency of it (.) helped with her development

FSL: ((in overlap)) Yeah yeah

Researcher: Are there any other erm (.) sort of aspects of the process of Forest Schools that helped with her confidence (.) so what specifically might have been about the Forest School that developed her confidence?

FSL: Erm (.) I think being in that environment

Researcher: Yeah

FSL: Erm again like I said before it's quite relaxing

Researcher: ((in overlap)) Yeah

FSL: It's that awe and wonder and that discovery and that freedom a little bit

Researcher: ((in overlap)) Yeah

FSL: In erm (.) cos although they're hooked in (.) there's always a flexibility about it so if anybody goes off on a totally different tangent (.) that's perfectly fine

Researcher: Yeah

FSL: Err and things like the mud pie kitchen (.) you know she (.) she loves to mix and she loves to (.) explore and she loves to make potiony type things and (.) Sarah like that kind of thing as well so there's lots of bouncing off

Researcher: Yeah

FSL: And lots of imaginative development in that area of her play which was really nice to see

Researcher: Yeah

FSL: Erm cos she is quite imaginative and quite creative and I think (.) using those natural resources around her to help that creativity (.) develop in a different direction

Researcher: Yeah

FSL: Was (.) a great thing for her to to have really

Researcher: Is there anything else you'd like to add about Maisie's experience?

FSL: Erm (.) no I think she's (.) I'm looking forward to seeing all three of those children next term

Researcher: Yeah

FSL: So that I can I've got a really nice starting point to actually help as when they go in the bigger woodland (.) you know

Researcher: ((in overlap)) Yeah

FSL: To see and to really (.) watch that and ((inaudible)) next term all three of them will have a little bit more freedom (.) err because sometimes children need that hook and that (.) erm

Researcher: ((in overlap)) Yeah

FSL: To get them (.) erm to get that learning

Researcher: ((in overlap)) Is it familiarising them

FSL: Yeah

Researcher: Yeah

FSL: And now that that has happened (.) then that little bit of freedom (.) hopefully they'll start to initiate that learning a little bit more as well which will be interesting to see (.) with those children

Researcher: Ok thank you

FSL: ((in overlap)) Yeah it's alright pleasure

Appendix 22: Example Diary Analysis

17th October

Forest School Diary

Have any of the children communicated and/or used language that they would not normally use?

Maisie is beginning to communicate more to both children and adults. Using a much louder voice than normal. When out of her comfort zone she reverts back to not communicating (e.g bow sawing, see below)

Stephanie is a lot more confident to answer group questions. She remembers what the teacher has told her and relays it later during activities.

Have any of the children engaged in team work and/or social interactions above what they would do so normally?

Have any of the children exhibited emotions? If so, what emotions and how were these displayed/managed?

Has Maisie done anything during the Forest School session that surprised you?

Maisie was team leader today. She was very confident at count all her friends in the room. Once in the garden we used a bow saw, Maisie was very unsure about holding onto the saw even though Lucy was holding it as well. She needed lots of encouragement and even another adult putting their hand over the top of Maisie's.

At tree climbing at first she thought she couldn't get to the first branch, unsure and anxious. With lots of encouragement to help her believe she could she managed it on the first branch, by the third attempt she climbed up and down by herself.

At snack time she used language independently asking adults questions and when she needed help. She used her big voice to ask all her friends if anyone would like her left over snack. This is a big improvement on confidence levels from a few weeks ago.

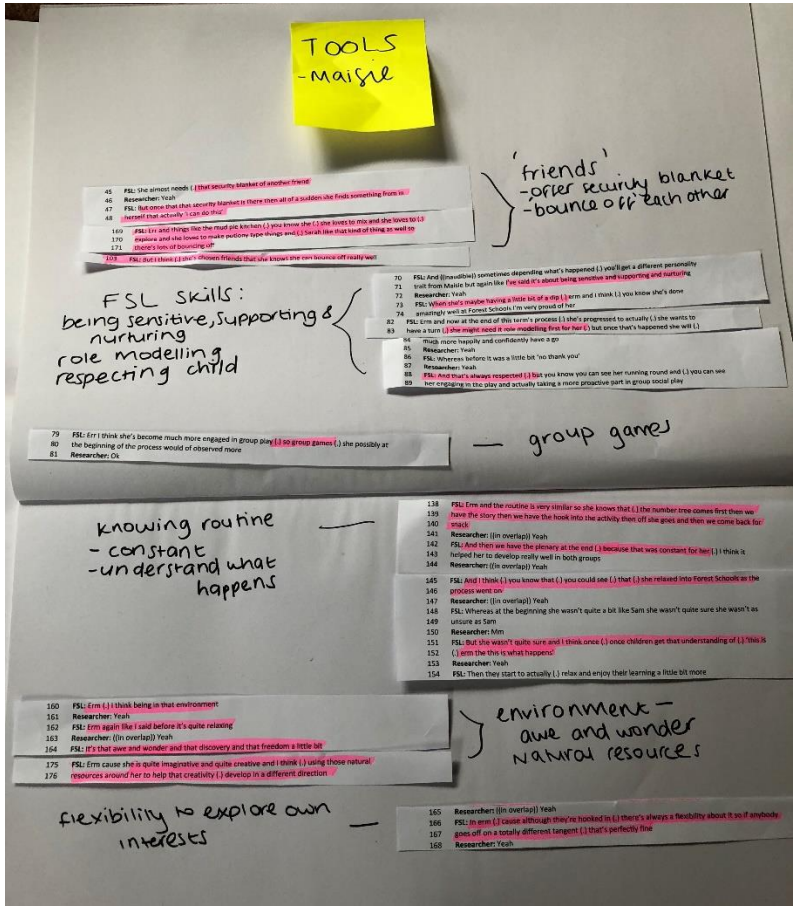
Has Tyler done anything during the Forest School session that surprised you?

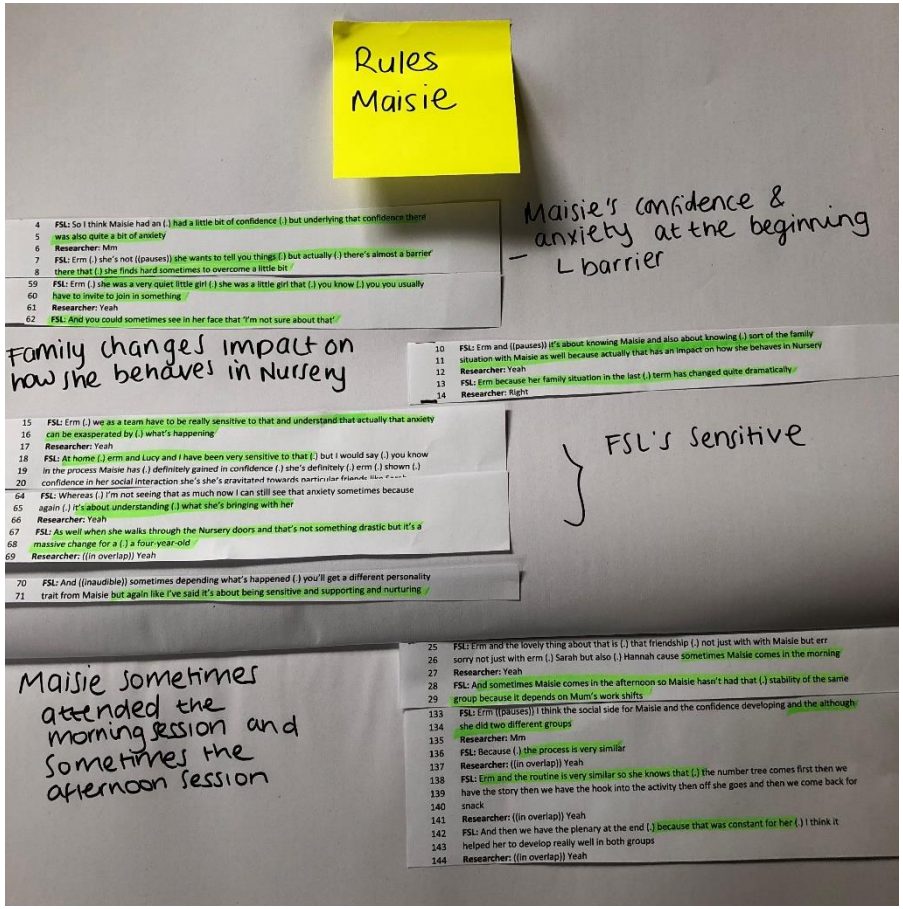
Very confidence at bow sawing, also could climb the tree all by himself.

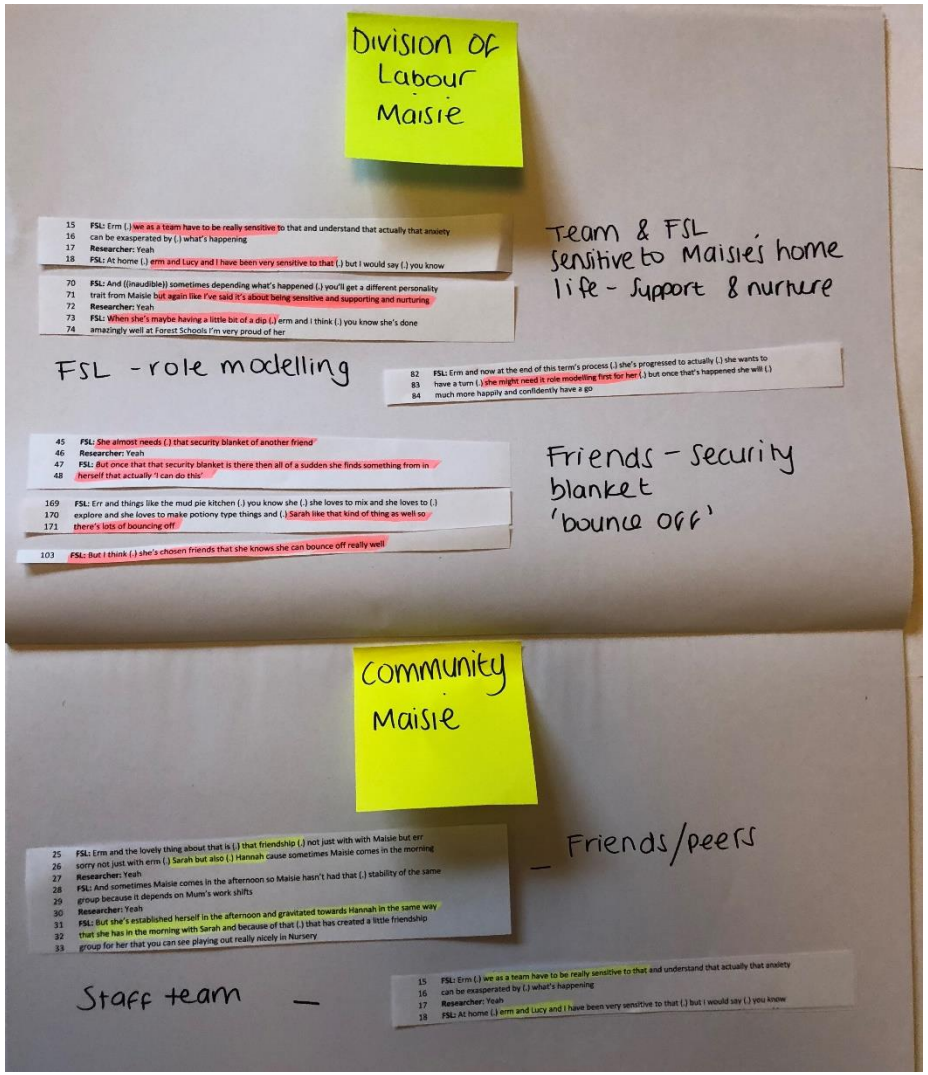
Has Sam done anything during the Forest School session that surprised you?

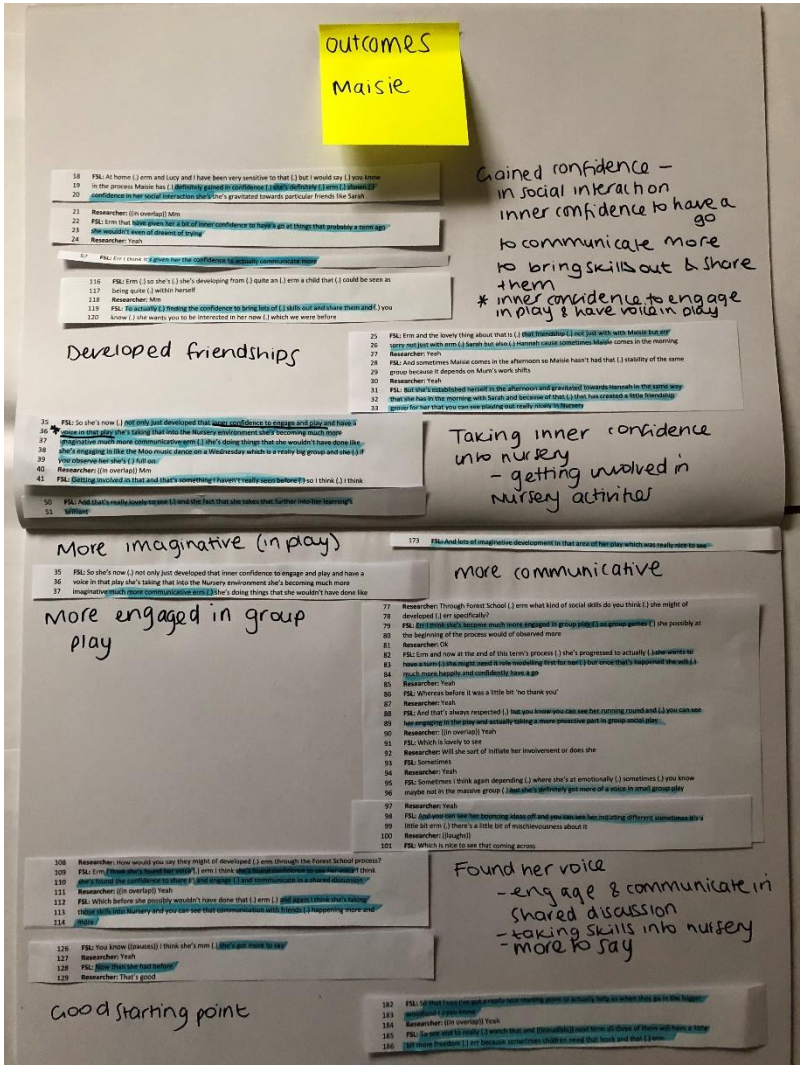
Sam didn't seem confident in himself to climb the tree but could do it by himself. Lizzie felt she didn't get and body language or facial expression from him to show or emotion to show if he needed help of not. We feel he's not expression much emotion at times.

Appendix 23: Interview Data Analysis (Maisie)






Division of Labour Maisie
Team & FSL sensitive to Maisies home life - support & nurture
FSL - role modelling
Friends - security blanket 'bounce off'
Community Maisie
Friends/peers
Staff team


outcomes Maisie
Gained confidence - in social interaction inner confidence to have a go to communicate more to bring skills out & share them
* inner confidence to engage in play & have voice in play
Developed friendships
Taking inner confidence into nursery - getting involved in Nursery activities
More imaginative (in play)
more communicative
More engaged in group play
Found her voice - engage & communicate in shared discussion - taking skills into nursery - more to say
Good starting point

Appendix 24: Tables of Extracts for each Node of Activity Triangle

Tools:

Interview Extract	Theme
(45) **FSL:** She almost needs (.) that security blanket of another friend (46) **Researcher:** Yeah (47) **FSL:** But once that that security blanket is there then all of a sudden she finds something from in (48) herself that actually 'I can do this' (49) **Researcher:** Yeah (50) **FSL:** And that's really lovely to see (.) and the fact that she takes that further into her learning's (51) brilliant	Friends
(169) **FSL:** Err and things like the mud pie kitchen (.) you know she (.) she loves to mix and she loves to (.) (170) explore and she loves to make potiony type things and (.) Sarah like that kind of thing as well so (171) there's lots of bouncing off	
(103) **FSL:** But I think (.) she's chosen friends that she knows she can bounce off really well	
(70) **FSL:** And ((inaudible)) sometimes depending what's happened (.) you'll get a different personality (71) trait from Maisie but again like I've said it's about being sensitive and supporting and nurturing (72) **Researcher:** Yeah (73) **FSL:** When she's maybe having a little bit of a dip (.) erm and I think (.) you know she's done (74) amazingly well at Forest Schools I'm very proud of her	FSL: Supporting and nurturing Role-modelling Respect child's choice
(82) **FSL:** Erm and now at the end of this term's process (.) she's progressed to actually (.) she wants to (83) have a turn (.) she might need it role modelling first for her (.) but once that's happened she will (.) (84) much more happily and confidently have a go (85) **Researcher:** Yeah (86) **FSL:** Whereas before it was a little bit 'no thank you' (87) **Researcher:** Yeah (88) **FSL:** And that's always respected (.) but you know you can see her running round and (.) you can see (89) her engaging in the play and actually taking a more proactive part in group social play	
(77) **Researcher:** Through Forest School (.) erm what kind of social skills do you think (.) she might of (78) developed (.) err specifically? (79) **FSL:** Err I think she's become much more engaged in group play (.) so group games (.) she possibly at (80) the beginning of the process would of observed more	Group Games

(138) **FSL:** Erm and the routine is very similar so she knows that (.) the number tree comes first then we (139) have the story then we have the hook into the activity then off she goes and then we come back for (140) snack (141) **Researcher:** ((in overlap)) Yeah (142) **FSL:** And then we have the plenary at the end (.) because that was constant for her (.) I think it (143) helped her to develop really well in both groups (144) **Researcher:** ((in overlap)) Yeah (145) **FSL:** And I think (.) you know that (.) you could see (.) that (.) she relaxed into Forest Schools as the (146) process went on (147) **Researcher:** ((in overlap)) Yeah (148) **FSL:** Whereas at the beginning she wasn't quite a bit like Sam she wasn't quite sure she wasn't as (149) unsure as Sam (150) **Researcher:** Mm (151) **FSL:** But she wasn't quite sure and I think once (.) once children get that understanding of (.) 'this is (152) (.) erm the this is what happens' (153) **Researcher:** Yeah (154) **FSL:** Then they start to actually (.) relax and enjoy their learning a little bit more	Knowing routine and an understanding of what happens at Forest School
(160) **FSL:** Erm (.) I think being in that environment (161 **Researcher:** Yeah (162) **FSL:** Erm again like I said before it's quite relaxing (163) **Researcher:** ((in overlap)) Yeah (164) **FSL:** It's that awe and wonder and that discovery and that freedom a little bit	Environment: Awe and Wonder Natural resources
(173) **FSL:** And lots of imaginative development in that area of her play which was really nice to see (174) **Researcher:** Yeah (175) **FSL:** Erm cos she is quite imaginative and quite creative and I think (.) using those natural resources (176) around her to help that creativity (.) develop in a different direction	
(166) **FSL:** In erm (.) cos although they're hooked in (.) there's always a flexibility about it so if anybody (167) goes off on a totally different tangent (.) that's perfectly fine (168) **Researcher:** Yeah (169) **FSL:** Err and things like the mud pie kitchen (.) you know she (.) she loves to mix and she loves to (.) (170) explore and she loves to make potiony type things and (.) Sarah like that kind of thing as well so (171) there's lots of bouncing off (172) **Researcher:** Yeah (173) **FSL:** And lots of imaginative development in that area of her play which was really nice to see	Flexibility and opportunity to explore own interests

(174) **Researcher:** Yeah (175) **FSL:** Erm cos she is quite imaginative and quite creative and I think (.) using those natural resources (176) around her to help that creativity (.) develop in a different direction	
Diary Extract	Theme
17th October Diary: (15) Maisie was team leader today. She was very confident at count all her friends in the room.	Opportunity to be team leader
17th October Diary: (15) Maisie was team leader today. She was very confident at count all her friends in the room. (16) Once in the garden we used a bow saw, Maisie was very unsure about holding onto the saw (17) even thought Lucy was holding it as well. She needed lots of encouragement and even (18) another adult putting their hand over the top of Maisie's. (19) At tree climbing at first she thought she couldn't get to the first branch, unsure and (20) anxious. With lots of encouragement to help her believe she could she managed it on the (21) first branch, by the third attempt she climbed up and down by herself.	FSL: Encouragement Hand over hand Support to focus
7th November Diary: (21) Needed drawing in a bit as distracted by another child, needed support to focus today.	
14th November Diary: (17) Attempted to climb the tree with encouragement. Managed to get to the bottom branch (18) herself. Needed support to jump down.	

Rules:

Interview Extract	Theme
(4) **FSL:** So I think Maisie had an (.) had a little bit of confidence (.) but underlying that confidence there (5) was also quite a bit of anxiety (6) **Researcher:** Mm (7) **FSL:** Erm (.) she's not ((pauses)) she wants to tell you things (.) but actually (.) there's almost a barrier (8) there that (.) she finds hard sometimes to overcome a little bit	Maisie's confidence and anxiety prior to starting Forest School acts as barrier
(59) **FSL:** Erm (.) she was a very quiet little girl (.) she was a little girl that (.) you know (.) you you usually (60) have to invite to join in something (61) **Researcher:** Yeah (62) **FSL:** And you could sometimes see in her face that 'I'm not sure about that'	

(10) **FSL:** Erm and ((pauses)) it's about knowing Maisie and also about knowing (.) sort of the family (11) situation with Maisie as well because actually that has an impact on how she behaves in nursery (12) **Researcher:** Yeah (13) **FSL:** Erm because her family situation in the last (.) term has changed quite dramatically (14) **Researcher:** Right (15) **FSL:** Erm (.) we as a team have to be really sensitive to that and understand that actually that anxiety (16) can be exacerbated by (.) what's happening (17) **Researcher:** Yeah (18) **FSL:** At home (.) erm and Lucy and I have been very sensitive to that (.)	Changes to the family situation impacted on Maisie's behaviour in nursery
(10) **FSL:** Erm and ((pauses)) it's about knowing Maisie and also about knowing (.) sort of the family (11) situation with Maisie as well because actually that has an impact on how she behaves in nursery (12) **Researcher:** Yeah (13) **FSL:** Erm because her family situation in the last (.) term has changed quite dramatically (14) **Researcher:** Right (15) **FSL:** Erm (.) we as a team have to be really sensitive to that and understand that actually that anxiety (16) can be exacerbated by (.) what's happening (17) **Researcher:** Yeah (18) **FSL:** At home (.) erm and Lucy and I have been very sensitive to that (.)	FSLs were sensitive to changes in Maisie's life
(64) **FSL:** Whereas (.) I'm not seeing that as much now I can still see that anxiety sometimes because (65) again (.) it's about understanding (.) what she's bringing with her (66) **Researcher:** Yeah (67) **FSL:** As well when she walks through the nursery doors and that's not something drastic but it's a (68) massive change for a (.) a four-year-old (69) **Researcher:** ((in overlap)) Yeah (70) **FSL:** And ((inaudible)) sometimes depending what's happened (.) you'll get a different personality (71) trait from Maisie but again like I've said it's about being sensitive and supporting and nurturing	
(25) **FSL:** Erm and the lovely thing about that is (.) that friendship (.) not just with with Maisie but err (26) sorry not just with erm (.) Sarah but also (.) Hannah cos sometimes Maisie comes in the morning (27) **Researcher:** Yeah (28) **FSL:** And sometimes Maisie comes in the afternoon so Maisie hasn't had that (.) stability of the same (29) group [redacted]	Maisie sometimes attended the morning session and sometimes the afternoon session • impacted on stability of the same group

(133) **FSL:** Erm ((pauses)) I think the social side for Maisie and the confidence developing and the although (134) she did two different groups (135) **Researcher:** Mm (136) **FSL:** Because (.) the process is very similar (137) **Researcher:** ((in overlap)) Yeah (138) **FSL:** Erm and the routine is very similar so she knows that (.) the number tree comes first then we (139) have the story then we have the hook into the activity then off she goes and then we come back for (140) snack (141) **Researcher:** ((in overlap)) Yeah (142) **FSL:** And then we have the plenary at the end (.) because that was constant for her (.) I think it (143) helped her to develop really well in both groups (144) **Researcher:** ((in overlap)) Yeah (145) **FSL:** And I think (.) you know that (.) you could see (.) that (.) she relaxed into Forest Schools as the (146) process went on	• process was similar between groups which allowed her to develop in both groups and relax into Forest Schools
Diary Extract	Theme
17th October Diary: (5) Maisie is beginning to communicate more to both children and adults. Using a much louder (6) voice than normal. When out of her comfort zone she reverts back to not communicating	When out of her comfort zone she reverted to not communicating

Community:

Interview Extract	Theme
(25) **FSL:** Erm and the lovely thing about that is (.) that friendship (.) not just with with Maisie but err (26) sorry not just with erm (.) Sarah but also (.) Hannah cos sometimes Maisie comes in the morning (27) **Researcher:** Yeah (28) **FSL:** And sometimes Maisie comes in the afternoon so Maisie hasn't had that (.) stability of the same (29) group [redacted] (30) **Researcher:** Yeah (31) **FSL:** But she's established herself in the afternoon and gravitated towards Hannah in the same way (32) that she has in the morning with Sarah and because of that (.) that has created a little friendship (33) group for her that you can see playing out really nicely in nursery	Friends/peers
(15) **FSL:** Erm (.) we as a team have to be really sensitive to that and understand that actually that anxiety (16) can be exacerbated by (.) what's happening (17) **Researcher:** Yeah	Staff team

(18) **FSL:** At home (.) erm and Lucy and I have been very sensitive to that (.) but I would say (.)	
Diary Extract	Theme
3rd October Diary: (13) Used her big voice at snack time to talk to friends.	Peers/Friends
17th October Diary: (15) Maisie was team leader today. She was very confident at count all her friends in the room	
7th November Diary: (21) Needed drawing in a bit as distracted by another child,	
21st November Diary: (6) Maisie and Tyler were competitive when wanting to help with the fire building	

Division of Labour:

Interview Extract	Theme
(15) **FSL:** Erm (.) we as a team have to be really sensitive to that and understand that actually that anxiety (16) can be exacerbated by (.) what's happening (17) **Researcher:** Yeah (18) **FSL:** At home (.) erm and Lucy and I have been very sensitive to that (.) but I would say (.)	Team and FSLs are sensitive to Maisie's home life
(70) **FSL:** And ((inaudible)) sometimes depending what's happened (.) you'll get a different personality (71) trait from Maisie but again like I've said it's about being sensitive and supporting and nurturing (72) **Researcher:** Yeah (73) **FSL:** When she's maybe having a little bit of a dip (.) erm and I think (.) you know she's done (74) amazingly well at Forest Schools I'm very proud of her	
(82) **FSL:** Erm and now at the end of this term's process (.) she's progressed to actually (.) she wants to (83) have a turn (.) she might need it role modelling first for her (.) but once that's happened she will (.) (84) much more happily and confidently have a go	FSLs role modelled
(45) **FSL:** She almost needs (.) that security blanket of another friend (46) **Researcher:** Yeah (47) **FSL:** But once that that security blanket is there then all of a sudden she finds something from in (48) herself that actually 'I can do this'	Friends provided a 'security blanket' and opportunity to 'bounce off' them
(169) **FSL:** Err and things like the mud pie kitchen (.) you know she (.) she loves to mix and she loves to (.) (170) explore and she loves to make potiony type things and (.) Sarah like that kind of thing as well so (172) there's lots of bouncing off	

(103) **FSL:** But I think (.) she's chosen friends that she knows she can bounce off really well	
Diary Extract	Theme
17th October Diary: (15) Maisie was team leader today. She was very confident at count all her friends in the room. (16) Once in the garden we used a bow saw, Maisie was very unsure about holding onto the saw (17) even though Lucy was holding it as well. She needed lots of encouragement and even (18) another adult putting their hand over the top of Maisie's. (19) At tree climbing at first she thought she couldn't get to the first branch, unsure and (20) anxious. With lots of encouragement to help her believe she could she managed it on the (21) first branch, by the third attempt she climbed up and down by herself.	FSLs provide encouragement and support
7th November Diary: (21) Needed drawing in a bit as distracted by another child, needed support to focus today.	
14th November Diary: (17) Attempted to climb the tree with encouragement. Managed to get to the bottom branch (18) herself. Needed support to jump down.	
21st November Diary: (6) Maisie and Tyler were competitive when wanting to help with the fire building	Peer provided opportunity to be competitive

Outcomes:

Interview Extract	Theme
(18) **FSL:** At home (.) erm and Lucy and I have been very sensitive to that (.) but I would say (.) you know (19) in the process Maisie has (.) definitely gained in confidence (.) she's definitely (.) erm (.) shown (.) (20) confidence in her social interaction she's she's gravitated towards particular friends like Sarah	Gained confidence: • social interaction • Inner confidence to have a go • Inner confidence to engage in play and have a voice in play • To communicate more • To bring skills out and share them
(22) **FSL:** Erm that have given her a bit of inner confidence to have a go at things that probably a term ago she wouldn't even of dreamt of trying	
(35) **FSL:** So she's now (.) not only just developed that inner confidence to engage and play and have a (36) voice in that play	
(56) **Researcher:** Would you how else would you say It's supported her emotional (.) well-being? (57) **FSL:** Err I think it's given her the confidence to actually communicate more	

(116) **FSL:** Erm (.) so she's (.) she's developing from (.) quite an (.) erm a child that (.) could be seen as (117) being quite (.) within herself (118) **Researcher:** Mm (119) **FSL:** To actually (.) finding the confidence to bring lots of (.) skills out and share them and (.) you (120) know (.) she wants you to be interested in her now (.) which we were before	
(25) **FSL:** Erm and the lovely thing about that is (.) that friendship (.) not just with with Maisie but err (26) sorry not just with erm (.) Sarah but also (.) Hannah cos sometimes Maisie comes in the morning (27) **Researcher:** Yeah (28) **FSL:** And sometimes Maisie comes in the afternoon so Maisie hasn't had that (.) stability of the same (29) group [redacted] (30) **Researcher:** Yeah (31) **FSL:** But she's established herself in the afternoon and gravitated towards Hannah in the same way (32) that she has in the morning with Sarah and because of that (.) that has created a little friendship (33) group for her that you can see playing out really nicely in nursery	Developed friendships in Forest School which has created a friendship group in Nursery
(35) **FSL:** So she's now (.) not only just developed that inner confidence to engage and play and have a (36) voice in that play she's taking that into the nursery environment she's becoming much more (37) imaginative much more communicative erm (.) she's doing things that she wouldn't have done like (38) she's engaging in like the Moo music dance on a Wednesday which is a really big group and she (.) if (39) you observe her she's (.) full on (40) **Researcher:** ((in overlap)) Mm (41) **FSL:** Getting involved in that and that's something I haven't really seen before (.)	Taking inner confidence into Nursery • Getting involved in nursery activities that she didn't before Forest School e.g. Big group activities
(50) **FSL:** And that's really lovely to see (.) and the fact that she takes that further into her learning's (51) brilliant	
35) **FSL:** So she's now (.) not only just developed that inner confidence to engage and play and have a (36) voice in that play she's taking that into the nursery environment she's becoming much more (37) imaginative much more communicative erm (.)	More imaginative • In play
(173) **FSL:** And lots of imaginative development in that area of her play which was really nice to see	
35) **FSL:** So she's now (.) not only just developed that inner confidence to engage and play and have a (36) voice in that play she's taking that into the nursery environment she's becoming much more (37) imaginative much more communicative erm (.)	More communicative

(77) **Researcher:** Through Forest School (.) erm what kind of social skills do you think (.) she might of (78) developed (.) err specifically? (79) **FSL:** Err I think she's become much more engaged in group play (.) so group games (.) she possibly at (80) the beginning of the process would of observed more (81) **Researcher:** Ok (82) **FSL:** Erm and now at the end of this term's process (.) she's progressed to actually (.) she wants to (83) have a turn (.) she might need it role modelling first for her (.) but once that's happened she will (.) (84) much more happily and confidently have a go (85) **Researcher:** Yeah (86) **FSL:** Whereas before it was a little bit 'no thank you' (87) **Researcher:** Yeah (88) **FSL:** And that's always respected (.) but you know you can see her running round and (.) you can see (89) her engaging in the play and actually taking a more proactive part in group social play (90) **Researcher:** ((in overlap)) Yeah (91) **FSL:** Which is lovely to see (92) **Researcher:** Will she sort of initiate her involvement or does she (93) **FSL:** Sometimes (94) **Researcher:** Yeah (95) **FSL:** Sometimes I think again depending (.) where she's at emotionally (.) sometimes (.) you know (96) maybe not in the massive group (.) but she's definitely got more of a voice in small group play (97) **Researcher:** Yeah (98) **FSL:** And you can see her bouncing ideas off and you can see her initiating different sometimes it's a (99) little bit erm (.) there's a little bit of mischievousness about it (100) **Researcher:** ((laughs)) (101) **FSL:** Which is nice to see that coming across	More engaged in group play • more happily and confidently have a go • more proactive part in group social play • more of a voice in small group play • bouncing ideas off
(109) **FSL:** Erm I think she's found her voice (.) erm I think she's found confidence to use her voice I think (110) she's found the confidence to share (.) and engage (.) and communicate in a shared discussion (111) **Researcher:** ((in overlap)) Yeah (112) **FSL:** Which before she possibly wouldn't have done that (.) erm (.) and again I think she's taking (113) those skills into nursery and you can see that communication with friends (.) happening more and (114) more	Found her voice • engage and communicate in a shared discussion • taken skills into nursery – communicating with friends more • got more to say than before

(126) **FSL:** You know ((pauses)) I think she's mm (.) she's got more to say (127) **Researcher:** Yeah (128) **FSL:** Now than she had before	
(179) **Researcher:** Is there anything else you'd like to add about Maisie's experience? (180) **FSL:** Erm (.) no I think she's (.) I'm looking forward to seeing all three of those children next term (181) **Researcher:** Yeah (182) **FSL:** So that I can I've got a really nice starting point to actually help as when they go in the bigger (183) woodland (.) you know (184) **Researcher:** ((in overlap)) Yeah (185) **FSL:** To see and to really (.) watch that and ((inaudible)) next term all three of them will have a little (186) bit more freedom (.) err because sometimes children need that hook and that (.) erm (187) **Researcher:** ((in overlap)) Yeah (188) **FSL:** To get them (.) erm to get that learning (189) **Researcher:** ((in overlap)) Is It familiarising them (190) **FSL:** Yeah (191) **Researcher:** Yeah (192) **FSL:** And now that that has happened (.) then that little bit of freedom (.) hopefully they'll start to (193) initiate that learning a little bit more as well which will be interesting to see (.) with those children	The 10-week cycle has put Maisie at a good starting point for the next 10-week cycle
Diary Extract	Theme
26th September Diary: (12) A lot more confident than she is in nursery normally.	More confident • confident at counting friends
17th October Diary: (15) Maisie was team leader today. She was very confident at count all her friends in the room.	
21st November Diary: (6) Maisie and Tyler were competitive when wanting to help with the fire building, Maisie (7) confidence was bigger.	
3rd October Diary: (13) Used her big voice at snack time to talk to friends.	Used big voice at snack time with friends
3rd October Diary: (14) Wasn't as vocal this week during activity	Wasn't as social during activity
17th October Diary: (5) Maisie is beginning to communicate more to both children and adults. Using a much louder (6) voice than normal.	Communicated more with children and adults • Used louder voice

17th October Diary: (19) At tree climbing at first she thought she couldn't get to the first branch, unsure and (20) anxious. With lots of encouragement to help her believe she could she managed it on the (21) first branch, by the third attempt she climbed up and down by herself. (22) At snack time she used language independently asking adults questions and when she (23) needed help.	• Used language independently and asked adults questions and for help • Used big voice with friends
17th October Diary: (22) At snack time she used language independently asking adults questions and when she (23) needed help. She used her big voice to ask all her friends if anyone would like her left (24) over snack. This is a big improvement on confidence levels from a few weeks ago.	
17th October Diary: (19) At tree climbing at first she thought she couldn't get to the first branch, unsure and (20) anxious. With lots of encouragement to help her believe she could she managed it on the (21) first branch, by the third attempt she climbed up and down by herself.	Unsure and anxious (about climbing tree) but managed by herself with encouragement
31st October Diary: (22) She was very focused whilst whittling and listened to the safety rules adapting her skills to (23) keep her safe.	Focused and listened to rules
7th November Diary: (21) Needed drawing in a bit as distracted by another child	Distracted by another child and needed support
14th November Diary: (17) Attempted to climb the tree with encouragement. Managed to get to the bottom branch (18) herself. Needed support to jump down. At the beginning of the bear hunt game she wasn't (19) very confident and didn't join in. At clue 9 out of 10 she really tried hard to find it.	At beginning of game wasn't confident but by the end, she really tried hard
21st November Diary: (6) Maisie and Tyler were competitive when wanting to help with the fire building	Competitive with peer

Appendix 25: Further Discussion of the Nodes of the Activity Triangles

Maisie

Community

It was reported in both the interview and in various diaries, that part of Maisie's community during Forest School were her peers, referred to as "friends". There were also references made to the staff "team" and the two FSLs.

Tools

There were a high number of tools that were identified for Maisie. 'Friends' were reported as providing Maisie with a "security blanket" to enable her to do things at Forest School and the opportunity to "bounce off" each other. In the interview there were a number of references to the FSLs. It was reported that they were supportive and nurturing when she was "having a little bit of a dip", they provide role-modelling for her and they always respect her decision to not engage in something. The FSLs were also noted in the diaries, however, different elements of this role were reported: they provided Maisie with encouragement, hand over hand support, and support to focus.

Group games were also referenced, as was the natural environment. The natural environment provided awe and wonder for Maisie and access to natural resources. It was noted that Maisie's knowledge and understanding of the routine of Forest School allowed her to develop well in both groups. It was highlighted that there is a "flexibility" about Forest School and that Maisie is able to engage in things she "Loves to do" (i.e. the mud pie kitchen), thus is was noted on the activity triangle that a tool for Maisie is the opportunity to explore her own interests. The 17th October diary also indicated that Maisie had the opportunity to be team leader.

Rules

It was suggested that Maisie's levels of confidence and anxiety prior to starting Forest School provided a barrier that "she finds hard sometimes to overcome". It was also noted that Maisie experienced some changes to her home situation,

which had an impact on her behaviour in nursery. The "team" and FSLs "have to be really sensitive to that and understand that actually that anxiety can be exacerbated by what's happening at home". In addition, Maisie attended different Forest School sessions each week (morning or afternoon), which meant that "Maisie hasn't had that stability of the same group". However, it was recognised that because the process and routine is very similar between these two sessions, this was constant for her and it "helped her develop really well in both groups". It was indicated in the 17th October diary entry that when Maisie is out of her comfort zone "she reverts back to not communicating", which could be seen as a constraint.

Division of Labour

It was highlighted that the staff team and FSLs are responsible for being sensitive to Maisie's home life and providing her with support and nurture. Furthermore, the FSLs provided scaffolding for Maisie, through role modelling. The diaries identified that the FSLs were also responsible for encouraging Maisie and provided hand over hand support. As noted, Maisie's "Friends" were responsible for providing a "security blanket" and the opportunity to "bounce off" them. In the 21st November diary it was noted that one of Maisie's peers was competitive with her.

Tyler

Community

Tyler's peers were noted as being part of Tyler's Forest School community in both the interview and diaries. Tyler worked with different peers. It was also reported that Tyler's parents enriched his skills at home, which suggests they are also part of the community.

Tools

In the interview, information was shared about Tyler's skills and his "starting point" when joining Forest School. It was reported that prior to starting Forest School Tyler was knowledgeable, confident, a team player, eager to share and take on responsibilities, enthusiastic, good at supporting and helping other children, respectful of other children, socially strong and emotionally solid. It was noted that Tyler carried his skills throughout the whole process, suggesting that, within the activity of Forest School, Tyler's own skills were a tool. It was also noted that the environment and "having all that natural wonder around him" had a positive impact. Tyler's respect for other children reportedly grew due to the tool of a "big group". Also, Tyler had the opportunity to engage in "group play" "play games" and to "think of his own games and for other children to join in with that". It was also suggested that Tyler had opportunities for "investigation" which supported his "curiosity".

In the diary entries, different tools were also highlighted. In the 3rd October diary it was reported that Tyler was inspired by a peer and they were "mirroring" and "bouncing off" each other, suggesting his peer was a tool during this session of Forest School. In the 31st October diary it was noted that Tyler "loved being challenged by a new skill" and in the 14th November diary that "he was given free time".

Rules

The skills that Tyler had in relation to respecting other children around him were reported to have grown due to being a part of a big group. Tyler had to work on relationships within that bigger group "it's almost about finding your place in that

group and he was quite, he wasn't dominating, but he was higher in terms of being able to share". Tyler had to work on his relationship with another boy at Forest School. It was reported that other initiative in school supported Tyler and that staff have an expectation of respect and responsibility from the children throughout the nursery. It was also noted that there is "an enrichment from home".

Division of Labour

In the interview, it was noted that Tyler's parents provide support to Tyler, by offering interaction and communication at home. The staff at the nursery are responsible for ensuring respect and responsibility is promoted throughout the nursery. Also, Tyler is responsible for using how own skills during Forest School "He's definitely come to Forest Schools as the beginning of the process as a confident, competent, communicative little boy and I think he's carried that through with him throughout the whole process".

The 3rd October diary entry highlighted that Tyler's peer was responsible for providing him with inspirations, mirroring and the opportunity to "bounce off" each other. In the 21st November diary it was noted that one of Tyler's peers was competitive with him. Also, Tyler provided support to one of his peers on 28th November "Stephanie found the confidence to retell the sequence story of Stick Man with the support of Tyler".

Sam

Community

It was reported that Sam's parents needed to become involved, as to enable Sam to have "continuity" at home and so they could talk "positively about it" with him. The social media site, Facebook, was noted as being a platform for the FSLs to share photos of the Forest School sessions. Also, within Sam's Forest School community are the peers/children that also engage in Forest School and the FSLs that support him.

Tools

It was reported that even though it took Sam a while to settle he "recovered really quickly" because the Forest School provided "familiarity". Also, Sam knew the expectations and routine, which helped him to know "what was coming next". The FSLs were noted on a number of occasions as providing various levels of support to Sam, which indicates they are a tool for Sam during Forest School. The FSLs provided Sam with "nurturing" and they played alongside him. It was reported that "it's about understanding him really". The diaries also indicated that in the first session of Forest School, the FSLs were a tool for Sam, providing him with "lots of reassurance and support". Further to this, in the interview, the FSL indicated that she had high expectations for Sam "I'm expecting next term he will grow even more", "he's on an upward journey".

Sam was given the opportunity to take on responsibilities as team leader, which was also mentioned in the 31st October diary and Sam "followed though his little responsibilities". Sam's peers were a tool for Sam at Forest School, as he learnt from them, "it was role modelled for him". As mentioned, the FSLs posted photos on Facebook which was noted as a tool for encouraging conversations between Sam and his parents "it gives him a tool, that Mum and Dad have been looking at with him and he's been able to tell them about what he's been doing because of the visuals to prompt them". The "bigger group" was also referenced, as was "social play games", which was "great for Sam", as he joined in with these.

Rules

At the beginning of the interview, time was spent discussing Sam's initial engagement with Forest School. It was reported that: "when Sam came to the Forest School process he was really upset and was very unsure", "it took him two or three weeks to actually settle", and "he had a bit of a rocky start". It was also noted that Sam missed three sessions of Forest School which was reported as being negative for Sam's experience: "unfortunately towards the end of the process Sam was unwell", "unfortunately at the end it threw him a tiny bit when he came back". However, it was also noted that when he returned to the sessions "he recovered quickly" and "that confidence came back", due to the familiarity of the sessions. The "routine" allowed Sam to know what was coming next. It was also reported in the interview that "he's got another term of Forest Schools next term" which signifies that Sam will have prolonged engagement with Forest School and that "we've got a different starting point to start from", for the next cycle of Forest School. It was also noted that "he's been part of a familiar group for six or seven weeks".

The diary entry taken on the first session of Forest School (26th September) reiterated what had been reported in the interview. Sam "lacked confidence, displayed anxiety and was very unsure" and "cried while we were getting ready. Not sure he understood where we were going, maybe thought it was a different school". In the 17th October diary it was noted that Sam did not give body language, show facial expressions or emotions to indicate if he needed help or not "we feel he's not expression much emotions at times", which appeared to be have an impact on the FSLs understanding of whether they should provide him with support during Forest School.

Division of Labour

As noted, Sam's parents were part of Sam's community. His parents were required to engage with the FSLs and were helped to "understand how Sam was feeling and for them to give that partnership of continuity at home so they could talk positively about it". Also, they utilised the photos that are uploaded to Facebook, as a tool

to initiate conversations about Forest School with Sam. The FSLs were responsible for working closely with Mum and Dad. They also provided him with nurturing, engaged in play with him and posted photographs on Facebook of Sam at Forest School. Sam's peers were responsible for providing Sam with role modelling: *"because he's seen other peers do that role and he knew what that role erm was he he wasn't wondering what to do" and "he'd seen it and it was role modelled for him".*

The 26th September diary highlighted that the FSLs were also responsible for providing "reassurance and support".